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How Do Informaticians and IT-Architects Collaborate, or Not? A Case Study from a Public Health Care Provider

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Abstract. Despite years of work from both informaticians and IT-architects interoperability within healthcare is still low. This explorative case study performed on a well-staffed public health care provider shows that the involved roles were unclear, processes did not include each other, and that tooling was incompatible. However, interest in collaboration was high and technical advances and inhouse development were seen as incentives for increased collaboration.

Keywords. Health informatics; Informatician; IT-architect; Interoperability, Collaboration

1. Introduction

Today's installed base of health information systems leaves much to wish for regarding interoperability. Managing and developing such an ecosystem can be viewed as a type of infrastructuring work, and the work processes involved can be analysed with sociotechnical frameworks [1].

Two roles involved are informaticians and IT-architects, where the former develop standards and information structures and the latter curate the installed based including the accumulated technological debt [2,3]. Research has been done on EHR implementations highlighting that informaticians should work together with health care staff [4], but there is scarce literature on how informaticians and IT-architects should collaborate to leverage informatic work in health care information systems and thus increase interoperability.

This paper presents results from an explorative case study aiming to explore how these two key roles collaborate. The work is a response to frustration from practioners within informatics as well as IT, aiming to elucidate possible explanations to a real-world problem [5,6]

2. Method

A publicly funded and run regional health care provider covering a population of approximately 1,2 million inhabitants was used as case for this work. The organisation

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had an IT-department catering for the entire organisation (including regional development, cultural activities and healthcare) with approximately 800 employees (whereof some are consultants). A health informatics unit was formed during 2018 and has since been staffed with between 20 and 30 informaticians.

Electronic health records (EHR) have been used in the organisation for approximately 30 years. The organisation was during data-collection going through configuration of a new central EHR system to replace several of the existing systems.

Primary data consists of nine semi-structured interviews which were made during November and December 2022. The informants were a purposive sample [7] of staff in different positions within the IT-department (n=6) and the health informatics unit (n=3). In addition to this, secondary data consisting of documents describing strategy, work processes and visions as well as informal talks have been used.

The interviews were semi structured and 45 to 90 minutes long. They were held and recorded via Teams and then transcribed by a professional transcriber. Bottom up open and selective coding as described by Urquhart [8] was done in ATLAS.ti [9]. The resulting codes were used for abductive reasoning. The interviews were made by the author who is a PhD-student and works at the regional health care provider.

3. Results

3.1. Stated Processes Does not Include 'the other'

The IT-department had a formal framework based on TOGAF enterprise architecture methodology and framework [10]. The regional adaption was well perceived amongst IT-architects, "*there are really good processes and ways of working with architecture in the region*." However, IT-architects and informaticians both stated that TOGAF and the regional adaption omitted informatics work

The informatics unit's processes were under development during data collection but at the time had no formal link to the IT-department.

3.2. Tools Do not Support Collaboration

The IT-department used the software iServer by Orbus Software and Visio by Microsoft to model, store and share documentation about architectural artifacts, whereas the informatics unit used Visual Paradigm for their information models. Neither had access to the other's system. This was perceived as a big hindrance "*the toolbox is a very large deficiency in the region… that one doesn't have unified tools do describe the same types of artifacts.*" leading to double work "*everyone in these [information] islands who work with the information… they have probably produced much material that never comes anyone else to gain.*"

Informants from the IT-department were either unaware of what the informatics unit worked with or knew about their work but did not have access to it *"And I haven't seen what you have developed. How have you done it by the way? Have you done it on your own or together with…?* " This problem was perceived also from the informatics unit who wished for tools that could visualise their work; "*I believe much misunderstanding in such discussions on collaboration would have been avoided if the results [information model] would have been more accessible.*"

3.3. Unclear Roles

The IT-department had six described IT-architect roles (see table 1); five based on the Swedish IASAs roles [11] and an additional role called "domain architect". The "domain architect" had a similar strategic view as the enterprise architect but with a smaller scope covering only part of the enterprise.

Table 1. Architect roles

Role in IT-department	Present in Swedish IASA	Resembling global IASA
Enterprisearkitekt	Yes	Enterprise Architect
Verksamhetsarkitekt	Yes	Information Architect Business Architect
Lösningsarkitekt	Yes	Solution Architect
Mjukvaruarkitekt	Yes	Software Architect
Infrastrukturarkitekt	Yes	Infrastructure Architect
Domänarkitekt	No	-

The Swedish IASA roles were in turn based on the international IASA roles [12,13] (note: the international version has since been revised). During translation the international roles "information architect" and "business architect" have been merged to "verksamhetsarkitekt", which roughly translates to "business architect". Thus, neither the Swedish IASA nor the region had a role "information architect". "Information architect" is described by Swedish IASA as a specialisation of "verksamhetsarkitekt" "*focusing on those parts of architectural work concerning information management*" [11].

The knowledge of the stated roles within the organisation was varied among the informants from the IT-department and low among the informants from the health informatics unit. Some informants stated they had, or mentioned relation to, the role "integration architect" which is not included in the regional description of roles. This role is described by Swedish IASA as a "*software architect focusing on integrations between different systems*" [11].

IT-management perceived the roles as guidance and said that architects are expected to do work also within other roles, especially regarding informatics; "*Regardless of what type of architect role one has … it is part of one's basic competence to have some sort of idea about information architecture and informatic work at some level."*

The informants from the health informatics unit had little insight into the different types of architects at the IT-department. They introduced themselves as informaticians, but those who had medical background also used the title "medical advisor" to display their background towards healthcare staff. Some informaticians said they might as well be called "information architects", and that colleagues with similar jobs in other regions in Sweden used that title.

Informants from the IT-department were unsure what the role "verksamhetsarkitekt" meant and no informant could name anyone with that title. The informaticians had a common understanding of the role "verksamhetsarkitekt" as a person modelling a business workflow both for process improvement and as input to informatics work exploring what information was used in the business. This is a limited scope compared to the Swedish IASA role where also "*how information is managed including analyses of information quality*"[11] is included. The informaticians did not see themselves as "verksamhetsarkitekter", nor did they know of any such employed in the organisation.

It was also unclear what role, if any, could make decisions regarding choices of informatic standards, on direct question, "*Who sets common standards?*" one informant replied, "*Everyone and no one.*"

3.4. Interest in Collaboration High But not Perceived As Reciprocal

Informants from the IT-department showed interest in working with informaticians; "*..for several years [we] have been thinking about how we will interact with [informatics]*" but had the impression that this interest was not reciprocal "*No, the informaticians they… no, they don't want to hear from us. They don't want to talk to IT.*

The informaticians stated that the practical work done by colleagues at the IT-department mainly focused on integrations and data extraction for secondary use, and that there were few possibilities to work with structured information all the way from the user; "*..it [our work] hasn't been able to make a difference. Because it is more about the systems not working together.*" The informaticians showed frustration over this but had also chosen "*an approach closer to describing the business information in a system or application independent fashion"* and were organisationally closer to the health care department than the IT-department.

3.5. Window of Opportunity

Several informants indicated a window of opportunity for increasing collaboration. Informants from the IT-department referred to a recent regional strategic decision to develop more inhouse systems as one such facilitator; "*and now we have, for the first time in a long time, a chance to work proactively … and also deepen collaboration with the informatics unit, to being also operative.*" The latter part of this quote refers to informatics work oftentimes not affecting documentation in use.

Informants from the informatics unit described the technical matureness of the installed base as a possibility to increase work with information structure; "*the more mature the technical architecture and technical settings … the more incentive there is to look at the structure [of the data] to make sure that the data you send between systems can be compared informatically."* Informants repeatedly stressed the involvement of healthcare staff and stated that the technical matureness also was essential to involve such personnel; "*It is very hard to motivate people to make a big effort when we don't have capacity to make use of it."*

4. Discussion

Previous research has shown collaboration as a central quality of interoperability work within infrastructuring and has shown the need for both balancing of relations through sociotechnical negotiations and adequate tooling [14].

This work showed poor relations in the form of processes not including both groups and incompatible tooling. These hindrances for collaboration were known by both informaticians and IT-architects. One reason to why these known problems were not already solved might be the unclear roles that were a previously unknown problem. Social negotiations are hard to expediate when the roles involved are now known. Organisations should put effort into clarifying different roles involved in complex collaborative settings.

Informants from both groups were interested in improving collaboration, and saw increased, albeit different, openings for this. Incentives and hindrances regarding this will be explored further in forthcoming work.

The author's knowledge of the studied organisation is both a strength and a limitation of this work. Another limitation is the relatively small sample size of informants. Some results could be due to specificities in the studied case, but they might also be transferrable to other settings.

5. Conclusion

Collaboration between informaticians and IT-architects was poor. Roles were unclear, processes did not include each other, and tooling was incompatible.

However, interest in collaboration was high and technical advances and inhouse development were seen as incentives for increased collaboration.

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