

Infrastructures in Healthcare: Shadow Systems as Creative Solutions

Nora Othilie Ringdal

Norwegian University of Science and Technology (NTNU)

nora.o.ringdal@ntnu.no

Many healthcare organizations struggle to adopt and integrate electronic health record (EHR) systems into their work practices (Hertzum et al., 2022). Extant literature has documented the failure of generic systems in large organizations which is often associated with a misfit between the organization and the system (Morquin et al., 2023). Such misfits can result in creative solutions like workarounds or shadow systems that are developed to overcome obstacles in day-to-day work (Bartelheimer et al., 2023). To avoid such solutions, the system needs to be configured for local practices. The complexity of local configuration increases in a healthcare context where the infrastructure consists of a range of systems, health professionals, institutions, and established practices (Ellingsen et al., 2022).

Through a case study of the implementation of an EHR system in the region of Central Norway, this research explores the creation of a shadow system in a primary healthcare unit. In 2019, the largest hospital and municipality in Central Norway decided to purchase an EHR system from the American vendor, Epic systems. At the same time the company, Helseplattformen AS, was established as the local implementation company. The aim was to provide primary and secondary healthcare with a joint solution so that "one patient has one medical record". The implementation process included a design phase, a testing phase, training, and a "big bang" go-live. Some units in the municipality were experiencing the benefits of the new EHR after six months, while other units were struggling to make the system fit the practice and vice versa.

During the design phase, a domain expert from primary care requested a bed planning tool that would make it possible for the coordinating unit in the municipality to plan patient stays with different units. It was requested several times due to its importance. However, it was not delivered by the local configurators or by the vendor. Six months after go-live the coordinating unit still did not have a planning tool and the domain expert did not know why it had not been delivered. While waiting for the necessary functionality, they developed a shadow system using an excel sheet that was shared with the other units. In addition to this being a cumbersome work practice, it can pose a threat to patient safety. The unit is still, one and a half years after going live, using the shadow system of the excel sheet.

This excel sheet can be seen as a creative solution that does not fit the infrastructure of the vendor's system. The vendor delivers an existing infrastructure that requires configurations when implemented in a country and service area that is different from where it was originally designed. Adding functionality to a generic solution can be difficult and often requires development by the vendor. In this case, the contract-based nature of the project and a lack of continuity post-implementation seems to make local configuration challenging for the user organizations. Further research will investigate the process of customizing EHRs in large organizations and the relation between the vendor and the user organizations in such processes.

References

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