

IT Decision Making in German Hospitals – Do CEOs Open the Black Box?

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Abstract. Health IT and communication systems are indispensable in German hospitals for clinical as well as administrative process support. However, IT is often regarded as a “black box” for hospital CEOs. Thus, the question arises how can CEOs decide if they do not know what is in the box? In order to answer this question, half-structured interviews with 14 German hospital CEOs were conducted. They revealed three principle decision processes: the supported decision, the joint decision and the corporate level decision. In all cases, the hospital CEO and the CIO interacted to reach the final decision, most strongly in the joint decision mode and least strongly in the corporate decision mode. Only the joint decision mode definitely forced the CEO to open the “black box” of IT. In the era of digitalisation, however, CEOs must develop better competencies to decide over complex matters.

Keywords. Chief executive officers, hospital, decision making, medical informatics

1. Introduction

Clinical processes in hospitals cannot be performed appropriately without the support of health IT [1-2]. Therefore, health IT is a matter of the boss, i.e. the chief executive officer (CEO) or top management team (TMT), which cannot be simply delegated. Ideally, CEOs or TMT work at eye level with the IT department, represented by the chief information officer (CIO)², to make decisions about IT investments. Nevertheless, IT is often regarded as “black box” by the CEO or TMT [2]. This could hold true for several reasons: Studies suggest that a considerable number of hospitals do not have enough IT staff. This underrepresentation of IT may lead the CEO or TMT to neglect IT issues. If IT is represented by a CIO and if, however, the CIO is not a member of the board of directors, IT topics are less discussed at board meetings and do not receive the same attention as other topics [3-6]. Furthermore, there is evidence that CEOs and CIOs may not share the same understanding of IT [3,7], that the TMT or CEO may underestimate the importance and the potential of IT or that misalignment between the hospital strategy and the IT strategy exists [3,8-9]. These circumstances can be interpreted as a symptom of CEOs and TMT members to treat IT as a “black box”. Against this background, the question arises: How can decisions about hospital IT be made if the one who decides does not have the necessary insight? IT governance models offer behavioural archetypes: e.g. business monarchy, which required full understanding of IT matters, or IT monarchy,

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² We use the term CIO for all persons in a leading IT role irrespectively of their position as board member.

which goes along with full decision power of the CIO [8]. Also the model of a strategic CIO - CEO partnership [3] emphasises aspects like trust, position of the CIO in the TMT, shared IT vision as factors that could impact the process of decision making. The IT decision process in hospitals leads to a multiple-criteria and a multi-stakeholder approach, which requires the stakeholders to possess fundamental IT knowledge. In any case, the “black box” of hospital IT has to be opened in order to come to founded decisions, whoever makes these decisions in the end. In this study, the interaction or missing interaction of CEOs and CIOs should be analysed. The questions thus were:

- How can the IT decision making process be described and what kind of interactions exist between CEOs and CIOs in this process?
- What are factors associated with the decision making process?

This part of the study tries to answer these questions from the perspective of hospital CEOs, a perspective that has been often neglected. Therefore, a qualitative, hypothesis generating approach was chosen.

2. Methods

In order to answer these questions, half-structured interviews with German hospital CEOs were conducted to analyse the IT decision process in depth. A literature research on decision making and CEO - CIO communication was performed in common databases (ACM, SpringerLink, IEEE Xplore, PSYCINFO) to design the interview guideline. Keywords such as CEO, CIO, relationship, decision making, health IT and synonyms were combined to find relevant studies. The following topics were identified as major areas of interest: reporting structure and responsibility for deciding on major IT issues including the role of the CIO [5-7,9], IT governance and strategy [7-8,10] as well as the relationship with the CIO [3-4,7]. IT decision making in healthcare was found to be covered only poorly by the literature. As it can be assumed that hospitals as expert organisations, with their particular structures and groups of influential persons, form a particular environment of its own, results from studies outside healthcare cannot be transferred to hospitals one-on-one. To close potential knowledge gaps, qualitative interviews were chosen to explore the topic, thus to be able to address and discussed individual issues during the interview. According to the guideline developed, the interviews should start with demographic information (hospital: size, ownership, group, type, teaching status; interview partner: age, gender, education, graduation, position). Before touching the major part about the decision making process, the guideline planned a question about how important IT was for the interviewee. This opening question was meant to set the stage for the following questions on decision making, in particular: “Who decides about major IT events?”, “How is this process initiated?” and “Is there any collaboration with the CIO?” and if yes “How do you collaborate with your CIO?”. Further questions addressed groups who contributed ideas to the decision making process. Moreover, there were questions on factors affecting the decision making process. Finally, we provided room to add new important topics, which we had not covered before. All eight questions (without demographics) were open and included the option to add new aspects.

We balanced the persons invited to the interview, who originated from a convenience sample, according to hospital size, affiliation to a hospital group (system affiliation), ownership and teaching status. Additionally, we tried to include interview partners with different degrees and gender to maximise the variety in the sample. The

guideline was sent to all participants prior to the interview. The recruiting process was stopped when all types of interviewees could be included and when the findings from the interviews saturated. The interviews were recorded and transcribed with MAXQDA 12. Data were analysed deductively based on main and subcategories derived from the literature and expert discussions. Furthermore, categories were inductively added during coding.

3. Results

A total of 14 interviews was conducted from 30th May to 11th October 2016, of which twelve were face-to-face interviews and two telephone interviews. The interviews lasted between 30 and 75 minutes.

Table 1: Hospital demographics

Ownership	Hospital size	System affiliation	Teaching status
Public [n=3]	Up to 299 beds [n=3]	Yes [n=7]	University hospital [n=1]
Private [n=3]	300 to 599 beds [n=7]	No [n=7]	Other teaching status [n=10]
Not-for-profit [n=8]	More than 600 beds [n=4]		No teaching hospital [n=3]

Participants were located in Lower Saxony [n=6], North Rhine Westphalia [n=5], Eastern [n=2] and Southern Germany [n=1]. The age of the participants was between 32 years and 56 years (mean 46 years, SD 7.26). Female [n=2] as well as male [n=12] interview partners were represented. All participants had an economic background, of which four had an additional degree in nursing and one in medicine.

According to all interviews, the decision making process was initiated by an idea that was stimulated in many cases by a new law or by the IT department and also by the clinicians or TMT, however, to a lesser degree. Three principle decision making processes were reported in the interviews (Figure 1a). In the first type of processes, the final decision was made by the hospital CEO who received advice and preparatory help from the CIO. Often an external consultancy firm was additionally involved. The process was accompanied by jour fixe meetings and dedicated project meetings. The second type embraced a joint decision process that resulted in collaborative decisions of the inter-professional team involved. The collaboration consisted of the CEO, the CIO and additionally end users, typically clinicians or their representatives. The final decision was collaborative and preceded by jour fixe meetings and if applicable by workshops. The third type of decision processes was characterised by the influence of the holding or any other parent corporation that made the final decision. As the interviewees reported, the CEOs, CIOs or regional CIOs from the group could occasionally impact these decisions depending on the individual CEOs or CIOs power and the group size or structure. In most of the cases, decisions made at corporate level had to be implemented: “We have a group strategy and as individual hospital we cannot deviate from it ...” [interview 9]. In 79% [n=11] of the cases, either type one or type three held true, whereas a joint decision was made only in 21% [n=3] of the cases. As seen in decision types one and two, there was an interaction between CEO and CIO on a regular basis. Most of the organisations (86% [n=12]) had fixed weekly or biweekly meetings. A majority of the CIOs was integrated into the TMT meetings: 50% [n=7] of the CIOs on a permanent basis, 14% [n=2] at least on call. The other CIOs [n=5] meet the CEO only on a jour fixe, at project or informal meetings.

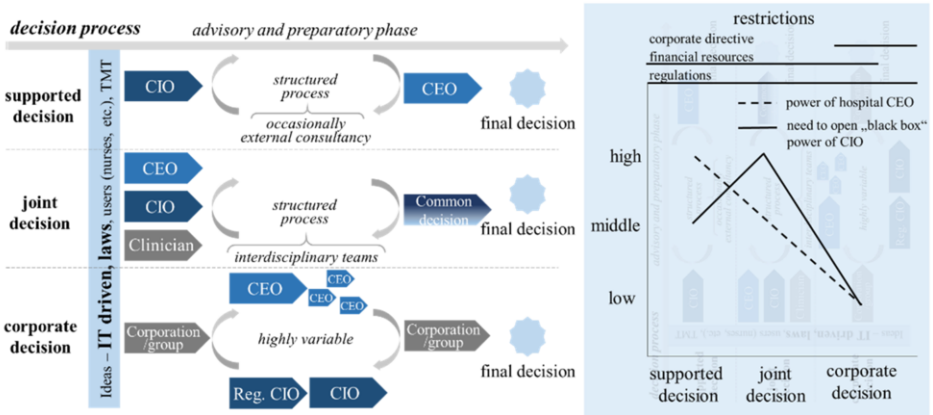


Figure 1a: IT decision making processes

Figure 1b: Hypotheses generated by this study

As the interview showed, the importance of IT was recognised by most CEOs. Statements like “without IT nothing works in our hospital” [interview 2] or “when IT collapses it is a disaster” [interview 14] underlined this notion. The interviewees reported that there existed an IT strategy, which was derived from the hospital or group strategy in most cases. Nevertheless, some hospitals reacted ad hoc when changes and resulting problems occurred. CEOs in this study mentioned “clinical process support”, “user satisfaction” and “legal regulations” as most frequent reasons for implementing new IT systems or improving existing ones. According to the interviews, CEOs regarded financial resources [n=10], corporate guidelines [n=7] and laws [n=6] as most important circumstances restricting their freedom of decision. Two interviewees emphasised “trust between CEO and CIO” to be crucial because the information given by the CIO could not be verified by the CEO due to missing IT knowledge.

4. Discussion

We conducted qualitative interviews to investigate the decision making process in German hospitals in order to identify core mechanisms and attitudes. Qualitative interviews offer the advantage to add evolving questions and extend the guideline in an individual way if necessary. Previous studies, which had focused on business IT and the relationship between CEO and CIO, could only partly mark out the field. The interviews, which were conducted in a sample representing many different kinds of hospitals, revealed three types of processes how decisions about IT investments are made: the supported decision, the joint decision and the corporate level decision. The first type represents a case with the greatest power of the CEO who seeks help from the CIO but in the end decides herself/himself. The second type reflects a shared decision approach which allows other stakeholders, i.e. the CIO and the clinicians, to contribute at eye level. In this case, the hospital CEO still possesses power to shape the final decision. The last type, finally, is characterised by the weakest position of the CEO, who has to bow to the corporate directive. It is also the last type, where the hospital CEO does not have any need to open the “black box” of IT. The first type of decision making is ambiguous with regard to the “black box” as the CEO receives help from the CIO. In this case, the CEO either fully trusts the CIO, as the interviewees remarked, and does not open the “black

box” or the CEO tries to understand what the CIO proposed and has to obtain at least some insight into what happens in the “black box”. The second decision type requires the CEO to fully understand at a high level how IT works in order to be prepared for the discussions with the CIO and the clinicians. These considerations lead to the hypotheses as shown in Figure 1b. All decision types are obviously independent of the importance of IT for the CEO as all the interview partners unanimously emphasised how essential IT was. It is interesting that many participants in this study mentioned better IT support of clinical workflows and increased user satisfaction as ignition for the IT decision process. However, only the joint decision type seemed to be appropriate for solving these problems. The dominance of financial arguments over matters of the “black box”, i.e. IT matters, is most strongly visible in the first decision type and we can assume that it is even more existing in the third type, when the decision is made at corporate level. CEOs in our study expressed the desire for more business thinking of the CIO, which reveals the wish for smoother discussions about financial issues. This qualitative study is mainly limited by its perspective that only covers the CEO’s one. However, as CEOs are the main decision makers, as this study supported, their views are of paramount importance.

5. Conclusion

This study revealed three types of IT decision making. Only one of them definitely forces the CEO to open the “black box” of IT. In the era of digitalisation, however, CEOs must develop better competencies to decide over complex matters, such as IT.

6. Conflict of Interest

There are no competing interests.

References

- [1] Kuperman G. Reflections on AMIA-looking to the future. *J Am Med Inform Assoc* **20** (2013), e367. <http://dx.doi.org/10.1136/amiajnl-2013-002435>
- [2] Simon A. Die betriebswirtschaftliche Bewertung der IT-Performance im Krankenhaus am Beispiel eines Benchmarking-Projektes. In: Schlegel H, editor. *Steuerung der IT im Klinikmanagement*. Vieweg + Teubner Verlag, Wiesbaden, 2010. 73-90.
- [3] Hütter A, Arnitz T, Riedl R. Die CIO/CEO-Partnerschaft als Schlüssel zum IT-Erfolg. *HMD – Praxis der Wirtschaftsinformatik* **50** (2013), 103-111. <http://dx.doi.org/10.1007/BF03340858>
- [4] Feeny DF, Edwards BR, Simpson KM. Understanding the CEO / CIO Relationship. *MIS Quarterly* **16** (1992), 435-448. <http://dx.doi.org/10.2307/249730>
- [5] Banker RD, Hu N, Pavlou PA, Luftman J. CIO Reporting Structure, Strategic Positioning and Firm Performance. *MIS Quarterly* **35** (2011), 487-504. <http://dx.doi.org/10.2139/ssrn.1557874>
- [6] Moghaddasi H, Sheikhtaheri A. CEO is a Vision of the Future Role and Position of CIO in Healthcare Organizations. *J Med Syst* **34** (2010), 1121-1128. <http://dx.doi.org/10.1007/s10916-009-9331-4>
- [7] Krotov V. Bridging the CIO-CEO gap: It takes two to tango. *Business Horizons* **58** (2015), 275-283. <http://dx.doi.org/10.1016/j.bushor.2015.01.001>
- [8] Weill P, Ross JW. *IT Governance*. Harvard Business School Press, Boston, 2004.
- [9] Köbler F, Fähling J, Leimeister JM, Krömer H. How German Hospitals Govern IT – An Empirical Exploration. Proceedings of the 17th European Conference on Information Systems (ECIS); Verona, Italy (2009), 317. <http://aisel.aisnet.org/ecis2009/317>
- [10] Johnson AM, Lederer AL. IS Strategy and IS Contribution: CEO and CIO Perspectives. *Information Systems Management* **30** (2013), 306-318. <http://dx.doi.org/10.1080/10580530.2013.832962>