



CIO in the Organizational Hierarchy

Mijo Šarčević^(✉)

Kaufland Hrvatska k.d., Zagreb, Croatia

Mijo.Sarcevic@gmail.com

Abstract. ICT - *Information and communications technology* as an important stakeholder and driver of modern progress. Since the investments in ICT are significant, there are also high and sometimes unrealistic expectations in terms of optimizing business quality and achieving a higher level of efficiency. All these expectations require high-quality and efficient management. The most crucial part of managing ICT in any organization is making good and timely decisions that will create new value and consistently, an expected competitive advantage. This is where the CIO - *Chief Information Officer* becomes an important factor because his skills and knowledge can optimize the organization. Otherwise, in the absence of the necessary knowledge and skills, the CIO can also set the organization back. Important decisions are made at higher hierarchical levels of the organization, so it is very important to emphasize that the CIO should also participate in the decision-making process. To participate in such decisions, it is crucial for the CIO to become a member of TMT - *top management team*. If the management has an inadequate level of ICT literacy, then it is questionable whether the CIO can even get the opportunity to optimize something, because there is a possibility that the expectations and understanding of the importance of the CIO are unrealistic. CIOs must also acquire the necessary managerial and communication skills to increase their influence. In this way, they will not only secure a board seat but also be able to participate in all important decisions.

Keywords: CIO · ICT · CIO hierarchical position · ICT literacy

1 Introduction

Every good and successful organization is aware of the importance of a well-established hierarchy and the responsibilities that a certain position carries. Unlike ICT, some professions and fields have been developing for decades, and therefore have had a satisfactory organizational framework for a long time. The ICT branch is among the younger ones with a history of only a few decades. In addition to all that, the ICT branch is the most susceptible to change because all professions rely on it as the primary technology for their operation and development. The responsible person for ICT in the organization is the CIO (Chief Information Officer). The importance of the role and hierarchical position of the CIO in the organization is subject to rapid and constant change. This was noticed by Rockart et al. in a visionary way back in 1982 when they claimed that the role of the CIO is changing much faster than the role of any other functional manager [1].

Sources suggest that it is crucial for the progress and success of ICT that the CIO be placed at an appropriate level on the hierarchical scale [2], all while respecting the organization's work philosophy, ownership structure, and work organization. Logically, the CIO should therefore be in a high hierarchical position. In order to successfully fulfill his role as a business technology strategist amid significant, rapid, and constant changes in the business environment, the CIO must be in a high, formal position in the organization [3].

Does the current "ideal" hierarchical position of the CIO satisfy the requirements of modern life and business? Should it be changed? If so, in which direction should the changes go? This paper aims to raise awareness of how big a role the CIO's hierarchical position plays in the success of the organization he works for. Certainly, this paper will also address the surrounding factors that influence the acceptance of the CIO's role as a crucial hierarchical position for the success of the organization.

2 Theoretical Framework

2.1 CIOs – Their Hierarchical Position in the Organization

We are becoming increasingly aware that ICT is a vital part of the 21st-century organization's strategy [2]. Successful organizations are founded on a clear hierarchical structure based on the principle: the higher the level, the greater the responsibility. For this reason, the CIO must be in an appropriate hierarchical position in order to perform his job well and meet the expectations of users and superiors [2]. Being at the appropriate level in the hierarchy gives them the opportunity to participate in the decision-making process and to take responsibility for ICT [4–6]. The CIO usually reports to the Chief Executive Officer (CEO) or Chief Financial Officer (CFO). However, organizations where the person responsible for the entire system and superior to the CIO possesses an adequate level of ICT literacy and understands the importance of ICT for the organization, have a significant competitive advantage [7]. Research shows that the management board's ICT literacy has a positive effect on the success of the organization [8].

In the early 1980s, during the initial attempts to scientifically explore this topic, Rockart et al. argued that the CIO must be a part of the organization's management to effectively perform his function [1]. This would enable CIOs to take explicit responsibility for ICT [4]. However, it is not enough to only appoint the CIO as a member of the board to ensure the success of ICT [9]. In order for him to take on a strategic role, he needs to be recognized as an executive manager [10]. However, there is no universally optimal hierarchical position for the CIO, [11] because each organization must determine the appropriate hierarchical structure and position of the CIO for itself. Nevertheless, a strong position in the organizational structure will enable the CIO to fulfill his business tasks more efficiently [12]. This is especially important when the organization faces greater instability [13] and changes in market conditions.

The CIO's primary tasks usually include providing high-quality services and ICT solutions, as well as coordinating costs and financial plans within the organization they work for. A high level of user satisfaction with ICT and its functionality is also an important and permanent task. In contrast, CEOs are focused on business performance, costs, and new projects that will improve the efficiency of employees and the business system

in general, which ultimately results in a good financial condition of the organization. How to reconcile these two different approaches and priorities is an additional challenge that requires considerable energy and time from the CIO. CIOs build a relationship with their superior based on their results and through a major contribution to optimized work processes in the organization. For this reason, it is necessary to build a good relationship between the CIO and the management, all for the purpose of better organizational results [2].

Feeny et al. emphasize that such a relationship between the CEO and the CIO will result in improvement in three areas, more specifically:

1. in the strategic planning of ICT,
2. in the cooperation between the IT sector and business operations,
3. in the involvement of the executive director in IT management [5].

In order for the CIO to establish good relations with the management, and thus achieve a higher position to make important decisions within the organization, it is also important to possess interpersonal skills and knowledge [14]. Such a position is directly related to the level of awareness of the CIO's power, which is based on his position in the organization [13].

With the development of ICT and complex relationships within organizations, about a decade after Rockart, Feeny et al. created and studied the concept of a successful relationship between the executive director and the CIO through the analysis of his previous career, achievements, aspirations, and position in the organization. They believe that the inclusion of the CIO in the board of directors is more important for success than reporting directly to the CEO [5]. However, the notion that the CIO is an outsider among managers on the board of directors is incorrect [15]. Such an unfavorable position would pose a problem for decision-making as well as taking on responsibilities.

Further examination of the importance of the CIO's role over time leads to some contradictory conclusions. The analytical company CIO predicted in 2003 that the importance of the CIO would diminish. Their research showed that in one year the number of CIOs reporting to the CFO increased from 11% to 22%, which puts the CIO in a disadvantageous position. Their salaries have decreased by 16% for the first time since 1985, with organizations looking for younger and cheaper experts to take over the role of CIO [16]. Research conducted in America between 1997 and 2007 brought completely opposite results and showed that in most companies the CIO is a member of the management board [17]. This certainly indicates that the attitude towards their role and hierarchical position is positive. However, in that period, there was also a European research that was conducted in the German-speaking area (Germany, Austria, and Switzerland), which showed that the person responsible for ICT is a member of the management board only in every fourth organization. This is mostly the case in organizations such as banks, insurance companies, and branches such as transport and logistics [18]. The result of this latest research is closer to the research conducted by the analytical company CIO. It is obvious that the significance of the role and hierarchical position of the CIO has its ups and downs.

Recently, organizations have been faced with great demands from the market and competition, which is why they are showing that there is a considerable level of awareness that a high hierarchical position is important for the success of the CIO. This is supported

by the latest research of the analytical company CIO published for the year 2023, which confirms that the largest percentage (49%) of CIOs report to the CEO [19]. Figure 1 shows how the CIOs' superiors are distributed. A comparison between 2023 and 2008 reveals an almost 20% increase in CIOs reporting to the CEO, while the number of those reporting to the CFO has decreased by more than half.

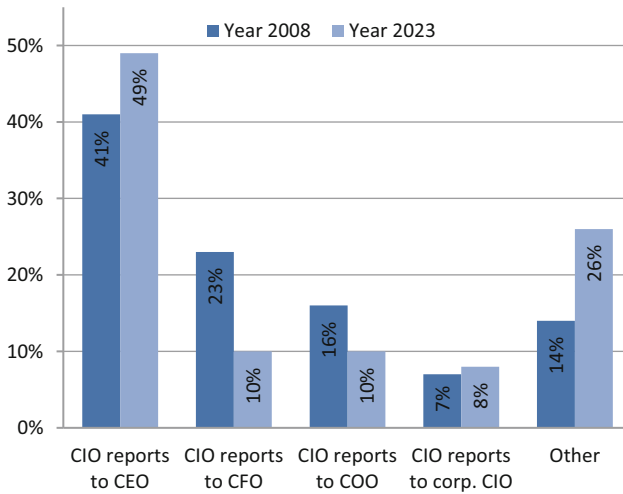


Fig. 1. Whom does the CIO report? Adapted according to the CIO Magazine 2023 [19]

According to all of the above, there is still no unified opinion about the most appropriate position of the CIO in the organization's structure [11], but everyone agrees that a higher hierarchical position gives them greater influence in the decision-making area. In many organizations, the CIO reports directly to the CEO and is a member of the board, but this does not always have to be the case as the specifics of each organization must be taken into account. Nevertheless, the strategic positioning of the CIO can help the status of IT as a sector and the efficiency of the organization in general [11]. It should be noted that nowadays more and more CIOs have a seat on the board and manage matters of strategic importance for the organization they work for [20], and this is certainly a big step forward.

2.2 The Cultural Gap Between the CIO and the Management Board

Peppard also points out that there is a gap in most organizations in the relationship between the business of the organization on the one hand and IT on the other [21]. The problem is that management often perceives the CIOs as outsiders [15] because it is considered that they, with their knowledge of business and finance, are not competent enough to be part of the management board [22, 23].

A cultural gap can be the cause of a *problematic marriage* between the IT sector and the business aspect of the organization [21]. This creates frustration for both *ICT*

and business managers, [24] which results in a bad work climate and indirectly leads to poor results. In order to correct this, it is important to align the cultural and political interests of the interested parties [25]. This alignment of interests is important, not only in terms of competitive advantage but also for the survival of the organization [26]. By investing in their competencies, CIOs can achieve a higher hierarchical position and have more opportunities to influence the reduction of the cultural gap. However, differences in perspectives between the business sector and the IT sector will never completely disappear [27]. It is the CIO who needs to worry about the acceptable level of these differences because this will allow him to be successful in this challenging position [28]. Otherwise, the importance of the CIO will decline.

2.3 Structural Strength of the CIO

The role and position of the CIO have evolved from the *new kid on the block* to a valued and equal partner in the organization's management board [29]. In order to control and manage the ICT strategy, the CIO must have a high formal position in the organization [3]. Today's CIOs are in most cases members of senior management who take on more influential roles, but their hierarchical position should not always be observed as an indicator of their strength and influence in the organization [11].

When observing the position of the CIO in the organizational hierarchy, one of the key aspects is often their structural strength [30]. The rapid changes in the role of the CIO and their position within the organization [1], coupled with their involvement in the board of directors, allow for informal interactions with other members of the executive team, thereby enhancing their understanding of business operations [22]. On the other hand, with the development of the CIO's level of business knowledge, his efficiency also increases. Consequently, his competencies can then play a crucial role in obtaining a proper hierarchical position as well as contributing to the structural strength within the organization [30]. There is a significant positive connection between the organization's strategic ICT vision and the CIO's position in the organization's structure and his structural strength [31].

Thus, the CIO's structural strength ensures his position in the organization's hierarchy [32]. CIOs who report to higher levels of management and are in a higher position in the organization have greater influence and control over the ICT strategy [33]. The CIO's greater structural strength amid market turbulence indirectly gives the organization a significant competitive advantage [13]. Modern CIO should be a member of TMT (top management team) but this is not enough because he also has to give additional business value [34].

2.4 (Non)Fulfillment of Management Expectations

Being a part of the management board allows the CIO to have a direct impact on decisions, ICT policies, and the direction of the organization, thereby making a significant contribution to better business results. However, the position of a CIO is very unstable [35]. Few companies have CIOs working for 5 or more years in the same position because the management board is generally very sensitive to any minor shortcomings or financial downturns. When poorer results emerge and the business suffers losses, the organization

starts searching for the causes and weaknesses in the system. The CIO is often the first person to feel the pressure. CIOs are expected to create additional value through savings and more efficient ICT, but this is not always easy to achieve. An additional burden on the CIO's back is the possibly poor level of ICT literacy of the management board, which has a weaker understanding of the importance of ICT for the organization [7]. And this subsequently has a negative impact on the success of the organization [8].

3 Research Methodology

3.1 Research Purpose and Research Samples

The purpose of this research is to examine the level of awareness about how important the appropriate hierarchical position of the CIO is in fulfilling his role and creating new value in the organization he works. The research was conducted in the Republic of Croatia. Furthermore, the objective is to compare the results with modern European and global trends because this is an important topic that often influences the success of the entire organization [36].

When selecting respondents, the following criteria were taken into account:

1. they must be the highest positioned person responsible for ICT in the organization,
2. reports to a maximum of two hierarchical levels above himself,
3. responsible for information systems and telecommunications, customer support and
4. for the strategic planning of ICT resources [37].

Among the surveyed 10 CIOs who come from various business areas such as higher education, production, construction, trade, insurance, and healthcare, there is an even representation of the private and public sectors in the Republic of Croatia.

3.2 Qualitative Research Approach

With the help of a semi-structured in-depth interview with 10 CIOs, we will try to find out which hierarchical position is most suitable for the success of the CIO and the organization he works for.

The *in-depth interview protocol* is based on sources that deal with communication skills and the role and hierarchical position of the CIO. Even though the focus will be on the hierarchical position in the organization, the protocol consists of the following four parts:

1. general information about the CIOs,
2. role and position in the organization,
3. communication role and
4. his skills.

None of the interviews were recorded because the respondents did not give their consent.

4 Results and Discussion

4.1 General Information About the CIOs

All ten interviewed CIOs have at least a university degree. Seven of them have a university degree, two of them have a Ph.D., and one has a Master of Science degree. Four of them are between 30 and 40 years old, four are between 40 and 50 years old, one is over 50, and one is over 60 years old. They have several years of experience in IT and are fluent in at least one foreign language.

4.2 Position in the Hierarchy of the Interviewed CIOs

Seven out of ten interviewed CIOs are in a high hierarchical position. They are either members of the board of directors or extended management, or they report to the CEO. Three of them report to the CFO.

Only three CIOs claim that their management has an adequate level of ICT literacy. Two CIOs rated their management's level of ICT literacy as average [8], while the other five rated their management negatively in terms of their level of ICT literacy.

Management boards that have been positively evaluated by the interviewed CIOs are generally made up of younger people who have an adequate level of ICT literacy. In one case, the CEO himself previously held the position of CIO. However, in practice, this rarely happens, except for organizations whose core business is ICT. Those types of organizations were not taken into account here.

Among the mentioned reasons for the low level of ICT literacy of their management board are the following:

1. they don't have time,
2. there is no will and no knowledge,
3. it's not their "core business",
4. they possess a certain level of knowledge, but only at the user level.

CIOs from three organizations, where the management has an adequate level of ICT literacy, are involved in the strategic decisions of their organization, while in the other 7 organizations, where the management has an inadequate level of ICT literacy, only one CIO is involved in making strategic decisions. This confirms the thesis that if the management has an adequate level of ICT literacy, then they also understand how important ICT is for the organization [7] and consequently will correctly evaluate the CIO and his role and position. Unfortunately, here we cannot compare the success of the mentioned organizations and determine the accuracy of the thesis that the high position of the CIO and the opportunity to participate in decision-making positively affect the success of the organization [8].

In the question about how they themselves assess the importance of their role in the organization and whether it is clear to everyone, 7 of them answered that their role in the organization is very important, two answered that it is partially important, and only one said that it is *not important at all*. It turns out that the importance of the CIO role is not clear enough to the management and all ICT users. *Except in extreme situations.*

Below are answers on how to improve the understanding of the importance of the role and hierarchical position of the CIO. This could be achieved: *through periodic education, for example, by teaching people what the IT sector does, and which interdependencies exist; by letting society's opinion mature through successful ICT projects; it is necessary to improve "internal PR"; through informal education, targeted presentations, conversations on the subject of ICT, targeted communication and education of users and management.* A CIO from a social organization pointed out that it is important *to establish healthy foundations in the public sector, and that management should be evaluated according to success, i.e. efficiency. Only then can a better appreciation of ICT be expected.*

What CIOs are certainly aware of is that it is necessary to build a culture of good relations [38] with the management board, in order to achieve a positive effect and relationship with the "business part" of an organization [20]. One important aspect is communication. CIOs should therefore use business language and not ICT jargon, which the CIOs of this study repeatedly pointed out as important.

4.3 The Importance of an Appropriate Position in the Organizational Hierarchy

The results of this research regarding the position in the organization show that as many as seven CIOs of this research are high on the hierarchical scale. This is consistent with the results obtained by Mađarić et al., where more than half of the CIOs were also highly ranked in the organizational hierarchy [39]. CIOs from this study are either members of the board of directors or extended management, or they report to the executive director (CEO), and only three of them report to the chief financial officer (CFO). Both of these Croatian results are in line with the latest global statistics, where CIOs are represented in the highest structures of the organization by as much as 49% [19].

When asked how much a high position in the hierarchy contributes to a CIO's success, almost everyone mentioned that the CIO's position is important because in this way he is closer to the decision-makers and this gives him the opportunity *to transfer information about problems and solutions, as well as to decide and participate in the decision-making process. The progress of ICT is not possible without the involvement of the CIO and therefore his high position in the hierarchy is very important.* Only one CIO pointed out that a high position in the hierarchy is not crucial, but it certainly helps *because it makes work easier.*

The organizations whose CIOs participated in this survey have excellent foundations for growth and progress. With the involvement of CIOs in the management board or high positions, the organization gets another very important player who can provide added value to the business. However, a paradox was observed in the answers regarding the importance of the CIO's hierarchical position in the decision-making context. Despite having 7 out of 10 CIOs in managerial positions, only 4 out of 10 actively participate in making strategic decisions.

This confirms that for the success of ICT, it is not enough to appoint the CIO as a member of the board [9]; he needs to be recognized and valued as an executive manager [10].

4.4 Limitations of This Research

The main shortcoming of this research is the insufficient number of respondents and the consent to participate in this research. For this reason, it was not possible to apply the research results to a specific area, i.e. differentiate the results according to areas, for example, draw a parallel between the private and public sector. Because of this, we were unable to get a better overview of the state of the ICT profession and the dependence of the role and hierarchical position of the CIO.

The percentage of CIOs who have a seat on the organization's management board is high, which shows that as a society we are aware of how important the high hierarchical position of the CIO is for the success of the organization. But is it only a matter of a high level of awareness? The list of organizations that participated in the research shows that many of them were modeled on foreign organizations or are their daughter companies, which suggests that this awareness somehow "comes from abroad".

4.5 Some Suggestions for Future Research

As with every research of this type, it is necessary to conduct it on a much larger sample with a mandatory division according to fields of activity. Since organizations in the public sector function differently and have different priorities compared to private organizations, it is necessary to make a clearer division here as well. It should also be investigated how the private and public sectors perceive the importance and hierarchical position of the CIOs in the organization with regard to the environment in which they work, but also what are the significant differences between them. It would be important to see how much the CIO's structural strength [30] affects business results. In companies that have outsourced their ICT system, the maintenance of the infrastructure and most of the services are transferred to another entity, and this changes the status, responsibilities, and required skills of the CIO. It would be worth investigating how the CIO's role, hierarchical position, and required skill set have changed in such companies. It would be necessary to examine, based on the Croatian example and by applying appropriate metrics, whether the high position of the CIO affects the positive results of the organization [8].

Therefore, it would be advisable to conduct this kind of research on a much larger sample in order to see what affects the status and high hierarchical position of the CIO, but also what technical and managerial skills he needs for this. It would also be useful to investigate what benefits arise for the organization from the CIO's high hierarchical position.

5 Conclusion

In challenging times in which there are constant rapid and major changes in the business environment, it is important to be aware of the importance of the role and hierarchical position of the CIO in the organization. This extremely important role indicates that the CIO should be among other bosses at the same management level – member of TMT. In order to reach that higher hierarchical position and be able to make important decisions, the CIO needs to possess a certain level of business knowledge and competencies, as

well as interpersonal skills. The CIO's superior is determined by the business philosophy and structure of the organization, and there is no indication that this will ever be unified in terms of defining the best place in the organization's hierarchy. Besides being one of the CEO's direct reports and thus having a higher rank in the hierarchy, there are also greater opportunities to obtain funds for ICT projects. This allows the CIO to significantly influence decisions, and, consequently, the success of the IT sector and the entire organization. In this research, where 7 out of 10 CIOs are board members, it seems that in these organizations the IT sector is viewed as a strategic department. Nevertheless, the answers indicate that the level of ICT literacy of the management board is not satisfactory for the majority of the interviewed CIOs. In this way, the CIO cannot really "use" his hierarchical position and bring significant advantages to the organization in the form of new projects and optimized processes. At the same time, only 4 out of 10 CIOs are involved in strategic decision-making. This shows that most of them, even though they are in a high hierarchical position, are not properly valued by their management. For the success of an organization, it is necessary to have a correct vision of ICT development and a high-quality leader of the IT sector i.e. CIO. The quality of a CIO is manifested through their professional, managerial, and communication skills, as well as human ethical values. That is precisely why it is the most important factor in the success or failure of an organization. In this context, it is of great importance how the CIO is perceived in his organization and where he is placed in the organizational hierarchy. His level of influence on the board of directors determines the level of his efficiency.

References

1. Rockart, J.F., Ball, L., Bullen, C.V.: Future role of the information systems executive. *MIS Quar.* **6**, 1 (1982). <https://doi.org/10.2307/248989>
2. Jerry, L.: IT-business alignment and the evolving role of the CIO and IT: 2017–18: Trends and Projections (2018)
3. Carter, M., Grover, V., Thatcher, J.B.: The emerging CIO role of business technology strategist. *MIS Q. Exec.* **10**(1), 19–29 (2011)
4. Stephens, C.S., et al.: Executive or functional manager?: yhe nature of the CIO's job. *MIS Quar.* **16**(4), 449–467 (1992)
5. Feeny, D.F., Edwards, B.R., Simpson, K.M.: Understanding the CEO/CIO relationship. *MIS Quar.* **16**(4), 435–448 (1992)
6. Earl, M.J., Feeny, D.F.: Is your CIO adding value? *McKinsey Q.* **2**, 144–161 (1995)
7. Aron, D.I.S, Jeffrey, L.: Understanding IT: a manager's guide. Prentice Hall, Financial Times, Essex (2003)
8. Anant, J., et al.: Board IT competence and firm performance. In: ICIS 2019 Proceeding, vol. 16. Munich (2019)
9. Peppard, J., Edwards, C., Lambert, R.: Clarifying the ambiguous role of the CIO. *MIS Quar.* **10**, 1 (2011)
10. Smaltz, D.H.: The elevation of CIO roles: organizational barriers and organizational enablers. *J. Healthc. Inf. Manag.* **14**, 1 (2000)
11. Banker, R.D., et al. CIO reporting structure, strategic positioning, and firm performance. *MIS Quar.* **35**(2), 487–504 (2011)

12. Ayat, S., Farajkhah, S.: Relation of CIO roles, IT and business alignment, and organizational performance. *J. Math. Comput. Sci.* **09**(02), 123–132 (2014). <https://doi.org/10.22436/jmcs.09.02.05>
13. Feng, C., Patel, P.C., Fay, S.: The value of the structural power of the chief information officer in enhancing forward-looking firm performance. *J. Manag. Inf. Syst.* **38**(3), 765–797 (2021)
14. Smaltz, D.H., Sambamurthy, V., Agarwal, R.: The antecedents of CIO role effectiveness in Organizations: an empirical study in the healthcare sector. *IEEE Trans. Eng. Manage.* **53**(2), 207–222 (2006). <https://doi.org/10.1109/TEM.2006.872248>
15. Grover, V., et al.: The chief information officer: a study of managerial roles. *J. Manage. Inform. Syst.* **10**(2), 107–130 (1993)
16. IMJ. CIO Role Is Being “Dumbed Down”, Study Says. *Inform. Manage. J.* 14 (2004)
17. Karanja, E., Zaveri, J.: IT leaders: who are they and where do they come from? *J. Inform. Syst. Educ.* **23**(2) (2012)
18. Riedl, R., Kobler, M., Roithmayr, F.: Zur personellen Verankerung der IT-Funktion im Vorstand börsennotierter Unternehmen: Ergebnisse einer inhaltsanalytischen Betrachtung. *Bus. Inform. Syst. Eng. Int. J. Wirtschaftsinformatik (Wirtschaftsinformatik)* **2**(50), 111–128 (2008)
19. CIO Magazine. State of the CIO, 2023: Building business strategy. CXO Media Inc. (2023). <https://www.cio.com/article/465327/state-of-the-cio-2023-building-business-strategy.html>. Cited 6 January 2024
20. Enns, H.G., McFarlin, D.B., Huff, S.L.: How CIOs can effectively use influence behaviors. *MIS Q. Exec.* **6**, 1 (2007)
21. Peppard, J.: Bridging the gap between the IT organisation and the rest of the business: plotting a route. *Inform. Syst. J. ISJ* **11**(3), 249–270 (2001)
22. Armstrong, C.P., Sambamurthy, V.: Information technology assimilation in firms: the influence of senior leadership and IT infrastructures. *Inform. Syst. Res.* **10**, 304–327 (1999)
23. Chen, D.Q., Preston, D.S.: Understanding CIO role effectiveness: the antecedents and consequents. In: *HICSS 2007 Proceedings of the 40th Annual Hawaii International Conference on System Sciences*. IEEE Computer Society, Washington, DC, USA (2007)
24. Remenyi, D., Grant, K.A., Pather, S.: The chameleon: a metaphor for the chief information officer. *J. Gen. Manag.* **30**(3), 1–11 (2005)
25. Weiss, J.W., Anderson, D.J.: CIOs and IT professionals as change agents, risk and stakeholder managers: a field study. *Eng. Manag. J.* **16**(2), 13–18 (2004)
26. Gottschalk, P.: The chief information officer: a study of managerial roles in Norway. In: *Proceedings of the 35th Hawaii International Conference on System Sciences – 2002* (2002)
27. Manfreda, A., Štemberger, M.I.: The business-IT relationship: towards a partnership relation. *Issues Inform. Syst.* **14**(2), 359–366 (2013)
28. Brenner, W., Brenner, B.: Digitalisierung: welche Rolle spielen CIOs heute und in Zukunft? *HMD Praxis der Wirtschaftsinformatik* **59**(3), 741–761 (2022). <https://doi.org/10.1365/s40702-022-00868-7>
29. Enns, H., Huff, S., Higgins, C.: CIO lateral influence behaviors: gaining peers’ commitment to strategic information systems. *MIS Q.* **27**(1), 155–176 (2003)
30. Cohen, J., Dennis, C.M.: Chief information officers: an empirical study of competence, organisational positioning and implications for performance. *South African J. Econ. Manage. Sci.* **13**, 2 (2010)
31. Al-Taie, M.Z., Lane, M., Cater-Steel, A.: The relationship between organisational strategic IT vision and CIO roles: one size does not fit all. *Australas. J. Inf. Syst.* **18**(2), 59–89 (2014)
32. Chen, D., Preston, D., Xia, W.: Antecedents and effects of CIO supply-side and demand-side leadership: a staged maturity model. *J. Manag. Inf. Syst.* **27**(1), 231–272 (2010)
33. Gottschalk, P., Taylor, N.J.: Strategic management of IS/IT functions: the role of the CIO. In: *Proceedings of the 33rd Hawaii International Conference on System Sciences – 2000* (2000)

34. Shawosh, M.: When do CIOs matter? the influence of CIO presence in TMT and shared domain knowledge on firm performance, p. 1. University of Georgia ProQuest Dissertations Publishing (2020)
35. Hillebrand, P., Westner, M.: Success factors of long-term CIOs. *Inform. Syst. e-Bus. Manage.* **20**(1), 79–122 (2021). <https://doi.org/10.1007/s10257-021-00546-z>
36. Bendig, D., Wagner, R., Piening, E., Foege, J.N.: Attention to digital innovation: exploring the impact of a chief information officer in the top management team. *MIS Quar.* **47**(4), 1487–1516 (2023). <https://doi.org/10.25300/MISQ/2023/17152>
37. Stephens, C., Loughman, T.: The CIO's chief concern: communication. *Inform. Manage.* **27**(2), 129–137 (1994)
38. Engesmo, J., Panteli, N.: Digital transformation and its impact on it structure digital transformation and its impact on it structure and leadership. In: 11th Scandinavian Conference on Information Systems, vol. 4 (2020)
39. Mađarić, M., Krakar, Z., Lovrek, V.: Roles and responsibilities of modern CIO – status and analysis of trends in Croatia. *CECIS* **2009**, 167–176 (2009)