Mutual Trust between the Chief Information Officer and Chief Executive Officer: Insights from an Exploratory Interview Study

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Abstract:
Research on the importance of the chief information officer (CIO) in organizations has received significant attention in the information systems (IS) literature over the past decades. However, research has insufficiently examined mutual trust between the CIO and other top managers, particularly the chief executive officer (CEO), which is problematic because trust is fundamental for all forms of cooperative behavior, which, in turn, determines the success of groups and organizations. Against the background of this significant research deficit, we report on an exploratory interview study that is part of a larger research project in which we investigate CIO-CEO interaction patterns. We report the trust-specific results of this project, based on 24 interviews (the CIO and CEO in twelve Austrian organizations). Our results reveal crucial mechanisms through which mutual trust emerges in CIO-CEO interactions, and we summarize our results in a conceptual framework. We embed findings of this study in a larger theoretical context; specifically, we establish a link to social capital theory, self-determination theory, and network gatekeeping theory.

Keywords: Chief Executive Officer (CEO), Chief Information Officer (CIO), CIO Decision Latitude, Information Behavior, IT Management, Common Language, Top Management, Trust, Trustworthiness.

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1 Introduction

Research on the importance of the chief information officer (CIO) in organizations has received significant attention in the information systems (IS) literature over the past few decades. It has found that CIOs are critical because they can positively influence organizational success through strategic initiatives. Against the background of the CIO’s importance for organizations, several studies have examined antecedents of CIO success. In essence, research has found that both internal (e.g., CIO hierarchical position and reporting structure; Banker, Hu, Pavlou, & Luftman, 2011, Armstrong & Sambamurthy, 1999; Smaltz, Sambamurthy, & Agarwal, 2006) and external (e.g., technological environment; Leidner & Mackay, 2007; Peppard, Edwards, & Lambert, 2011; Preston, Leidner, & Chen, 2008) factors contribute to CIO success and organizational performance.

For organizational performance, one important factor is mutual trust between the CIO and other top managers, particularly the chief executive officer (CEO) (Nelson & Cooprider, 1996; Spitze & Lee, 2012). In particular, in the light of recent business-IT alignment initiatives, trust between the CIO and CEO is an important topic both from a theoretical and practical perspective (Karahanna & Preston, 2013; Luftmann, 2000; Wagner & Weitzel, 2012; Wagner, Beimborn, & Weitzel, 2014). Research findings in several disciplines, in addition to the above-mentioned IS papers, substantiate the notion that research on CIO-CEO trust is an important topic predominantly because mutual trust is an antecedent of critical organizational outcomes. First, evidence indicates that mutual trust between top management team (TMT) members positively affects decision quality (Carmeli, Tishler, & Edmondson, 2011). Second, research shows that intragroup trust in a TMT positively affects conflict processes (Simons & Peterson, 2000). Specifically, Simons and Peterson (2002) found that intragroup trust in a TMT is positively related to task conflict (defined as “a perception of disagreements among group members about the content of their decisions [involving] differences in viewpoints, ideas, and opinions”, p. 102) and negatively related to relationship conflict (defined as “a perception of interpersonal incompatibility [typically including] tension, annoyance, and animosity among group members”, p. 102). Because task conflict predicts group decision quality and affective acceptance of group decisions and relationship conflict negatively affects group satisfaction, group commitment, and group decision quality (for empirical evidence, see sources cited in Simons and Peterson 2000), intragroup trust in a TMT is a critical antecedent of several important outcome variables. Rau (2005) confirmed that a low level of relationship conflict in a TMT positively affects team performance. Third, research has identified several trust-related behaviors with positive valence, such as cooperation, information sharing, or reduction of control (for a review, see McKnight & Chervany, 2001), which suggests that high levels of mutual trust between top managers, such as between a CIO and CEO, are likely to positively affect these behaviors.

Contribution:

Mutual trust between a CIO and other top managers, particularly the chief executive officer (CEO), has received insufficient research attention, which is problematic because trust is fundamental for all forms of cooperative behavior, which, in turn, determines the success of groups and organizations. Against the background of this significant research deficit, we report on an exploratory interview study that is part of a larger research project in which we investigate CIO-CEO interaction patterns. We report the trust-specific results of this project based on 24 interviews (the CIO and CEO in twelve Austrian organizations). Our results reveal crucial mechanisms through which mutual trust emerges in CIO-CEO interactions, and we summarize our results in a conceptual framework. In essence, our study shows that informal communication between the CIO and CEO positively affects the development of a common language, including shared narratives such as shared stories and metaphors. This common language, in turn, positively affects mutual trust between the CIO and CEO, which influences CIO decision latitude (i.e., higher levels of CEO trust in the CIO lead to more CIO decision latitude) and information sharing (i.e., higher levels of mutual trust lead to more information sharing between the CIO and CEO). Understanding the mechanisms that we reveal in our study enables CIOs and CEOs to actively control and interpret specific behaviors to positively affect trust, a fact that is critical in light of the recent calls for improved business-IT alignment.

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1 We emphasize that we focus on the CIO and not on related emerging concepts such as chief digital officer (CDO). We refer the reader to Bharadwaj, El Sawy, Pavlou, and Venkatraman (2013), Matt, Hess, and Benlian (2015), and Horlacher and Hess (2016) who provide insights into digital transformation and corresponding implications for CIOs.
Fourth, evidence indicates that the efficacy of the management-by-objectives (MBO) approach, a major management approach in contemporary organizations (e.g., Wehrlin, 2012), is critically related to trust among the acting protagonists (e.g., Scott, 1980), such as a CEO and CIO. It follows that a modern management approach, such as MBO, builds on mutual trust. Fifth, organizational trust is critical for the success of IT projects (for a recent review, see Jetu & Riedl, 2012). Sixth, research has established that trust is fundamental for all forms of cooperative behavior (e.g., Luhmann, 1979; Riedl & Javor, 2012; Rousseau, Sitkin, Burt, & Camerer, 1998), which, in turn, determines the success of groups and organizations (Jones & George, 1998; Mayer, Davis, & Schoorman, 1995).

Despite its obvious importance, trust between the CIO and CEO has received insufficient research attention. Based on our literature review (see Section 2.2 and the analysis in Appendix A), we draw the following conclusions:

1) No scientific research study has focused on mutual trust between the CIO and CEO (the identified papers only touch on this topic).
2) The few available research papers do reveal some insights into the nature of CIO-CEO trust and its antecedents and consequences. Yet, a cumulative research tradition as we know it from other IS trust research domains (e.g., trust in e-commerce) does not exist.
3) Antecedents and facilitators of CIO-CEO trust have been studied less than the consequences of mutual trust; it follows that we know more about the positive effects of trust (e.g., CIO effectiveness) than about its determinants.
4) Except a few notable examples (e.g., Nelson & Cooprider, 1996: MIS Quarterly; Smaltz et al., 2006: IEEE Transactions on Engineering Management; or Karahanna & Preston, 2013: Journal of Management Information Systems), several papers are more oriented toward practitioners than academics.

Against the background, we focus on stimulating academic research that studies the nature of CIO-CEO trust.

This lack of reference to CIO-CEO trust research is problematic both from a theoretical and a practical perspective. In this paper, we report on an exploratory interview study that is part of a larger research project in which we investigate CIO-CEO interaction patterns. We report the trust-specific results of this project based on interviews that we conducted in twelve Austrian organizations (we interviewed the CIO and CEO in each company). In essence, the findings of our explorative study reveal crucial mechanisms through which trust emerges in CIO-CEO interactions. Thus, this qualitative study provides both a theoretical and a practical contribution.

From a theoretical perspective, our identifying trust's mechanisms. From a practical perspective, understanding these mechanisms enables CIOs and CEOs to actively control and interpret specific behaviors to positively affect trust. Because trust between the CIO and CEO is critical for business-IT alignment (Karahanna & Preston, 2013), which, in turn, affects organizational performance (Gerow, Grover, Thatcher, & Roth, 2014), the study of trust is essential from an IT management perspective (e.g., Guillemette & Paré, 2012). Importantly, because we have investigated both the CIO and CEO perspectives, the present study offers a richer picture than a purely CIO or CEO perspective alone could offer.

This paper proceeds as follows. In Section 2, we define trust and related work and show that empirical findings in the research domain of this paper are sparse. In Section 3, based on this foundation, we outline our research methodology. Afterward, in Section 4, we present the results of our interviews, and, based on the results, we develop a conceptual framework on CIO-CEO trust, which signifies the explorative nature of our examination. Importantly, in Section 5, we discuss major findings of our study in the context of three theories (social capital theory, self-determination theory, and network gatekeeping theory) and, thereby, embed our results in a larger theoretical context. In Section 6, we describe the study's limitations and outline potential avenues for future research. Finally, in Section 7, we conclude the paper.
2 Related Work

2.1 Definition of Trust

In this paper, we adopt Rousseau et al.’s (1998, p. 395) seminal definition for trust: “Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (our emphasis). Other scholars also describe trust as a behavior that makes one party, the trustor, vulnerable to the actions of another party, the trustee (e.g., Fehr, 2009), a notion that IS research has also adopted (e.g., Riedl, Mohr, Kenning, Davis, & Heekeren, 2014). Trust-related behaviors include cooperation, information sharing, or reduction of control (e.g., McKnight & Chervany, 2001). Disposition to trust (i.e., “a general propensity to trust others”; McKnight, Choudhury, & Kecmar, 2002, p. 336) and beliefs about the trustee’s trustworthiness (Mayer et al., 1995) influence this behavior in the trustor. Major characteristics of a trustee include ability, benevolence, and integrity (Mayer et al., 1995). Thus, a trustee is trustworthy if the trustee has skills and competencies that are important for the relationship (ability), means well toward the trustor aside from an egocentric profit motive (benevolence), and adheres to a set of generally accepted principles and rules (integrity)².

With respect to the CIO-CEO trust relationship, we note that both parties may act in the role of trustor and trustee. For example, effective business-IT alignment implies that a CIO must develop a good understanding of the organization’s needs and expectations about IT and, hence, must trust, at least to some degree, the CEO, and a CEO must develop a good understanding of the IT function’s capabilities and, hence, must trust, at least to some degree, the CIO (Guillemette & Paré, 2012; Karahanna & Preston, 2013).

2.2 Mutual Trust between the CIO and CEO: What We Know

As we outline in Section 1, little research has examined mutual trust between the CIO and CEO (and other executives). To formally verify this observation, we conducted multiple literature searches via EBSCOhost and Web of Science since the beginning of our larger research project on CIO-CEO interaction patterns several years ago. Based on these searches (the last one was conducted on June 1, 2016), we could identify no paper that specifically focused on this topic (specifically, we searched the title field for: “chief information officer”/’CIO’ AND ‘trust’"). Next, we electronically searched for the term “trust” in all 110 CIO papers in our literature database of the aforementioned larger project to identify text passages related to trust (readers can obtain the list of papers on request from the third author).

We analyze the related work in the following paragraphs. We confine our discussion to four studies in which we identified at least subsections related to trust or passages that went beyond a few lines of text on trust. In Appendix A, we additionally summarize trust statements that we found in the CIO literature. Altogether, our literature review shows that research on trust in the CIO domain is sparse, a fact that holds particularly true if one focuses on high-quality academic papers rather than practitioner-oriented ones. Yet, in analyzing related work, we also found that the literature articulates importance of the topic well.

Nelson and Cooprider (1996) studied the contribution of shared knowledge to IS group performance. They argued that the working relationship between IS executives and managers of other departments can positively affect IS performance. They theorized that shared knowledge is achieved through different mechanisms, one of which is mutual trust. Using path analysis in a study of 86 IS departments, they found that shared knowledge mediated the relationship between mutual trust and IS performance. Higher levels of mutual trust resulted in higher degrees of shared knowledge between IS executives and managers in other departments, which, in turn, was positively related to IS performance.

Smaltz et al. (2006) raised the following research question: what are the major antecedents of CIO role effectiveness? Based on survey data from CIOs and TMT members in the healthcare sector (136 TMT members who represented 106 organizations completed the survey), the authors found that CIOs typically act in six different roles: business strategist, integrator, relationship architect, utility provider, information

² Note that, if compared to theorizing in the past, doubts exist today that trustors regularly evaluate ability, benevolence, and integrity to assess a trustee’s trustworthiness. Rather, recent laboratory and field evidence indicates that perceived trustworthiness (PT) is, at least in some trust situations, represented by a Boolean relationship, where: PT = f{Ability) AND (Benevolence OR Integrity)} (Barki, Robert, & Dulipovici, 2015, p. 484). Thus, benevolence and integrity are, at least in some trust situations, correlated and lack in significant unique effects (Colquitt, Scott, & Lepine, 2007; Schoorman, Mayer, & Davis, 2007). It follows that trustworthiness evaluations are often made based on an “ability + benevolence” judgment or an “ability + integrity” judgment (Barki et al., 2015).
steward, and educator (for details, see p. 216 in Smaltz et al.). Moreover, they found that business and strategic IT knowledge, political savvy, and interpersonal communication make CIOs effective, predominantly in the roles of business strategist, integrator, and relationship architect. From a trust perspective, the authors found that the extent of trusting relationships was significantly correlated with TMT/CIO engagement, which, in turn, was related to CIO role effectiveness. Thus, this study identified trust as an important antecedent of CIO effectiveness.

Karahanna and Preston (2013) investigated the effect of social capital of the relationship between the CIO and TMT on firm performance. They analyzed responses from CIOs and matched TMT members from 81 hospitals in the United States. Among other results, they found that CIO-TMT cognitive social capital (defined as “shared representations, interpretations, and systems of meaning among parties”, p. 20) positively affected CIO-TMT relational social capital (defined as “a multidimensional construct consisting of the TMT’s trust in the CIO and the CIO’s trust in the TMT”, p. 27), which, in turn, positively affected strategic business-IT alignment and also firms’ financial performance. Thus, this study shows that mutual trust between the CIO and other TMT members (including the CEO, p. 29) constitutes an important determinant of positive organizational outcomes.

In investigating CIO behaviors, Spitze and Lee (2012) identified the most critical role-specific CIO career success factors based on examining the career biographies of fourteen successful CIOs (whom a committee of five globally distinguished peers selected). Specifically, the authors conducted the interviews using a set of twelve open-ended “conversation-provoking” questions. In their paper’s results section, Spitze and Lee summarize six “soft attributes” that are characteristic for all successful CIOs, and having “a trusting and trustworthy nature” is among them (p. 84). Based on this finding, Spitze and Lee argue that CIOs must “become trusting and trustworthy” in order to increase their success potential (p. 87). However, they do not describe what exactly might foster trust in the paper.

To sum up, Smaltz et al. (2006), Nelson and Cooprider (1996), and Karahanna and Preston (2013) identified trust as a critical antecedent of individual (i.e., CIO role effectiveness) and organizational (i.e., IS performance and firm financial performance) outcome measures and also revealed mechanisms through which trust affected these measures (e.g., TMT/CIO engagement or shared knowledge). Moreover, the Spitze and Lee (2012) study identified trust in other executives and the CIO’s own trustworthiness as major characteristics of successful CIOs. However, despite the value of these empirical studies, they do not reveal comprehensive insight into the root causes and mechanisms of CIO-CEO trust.

3 Methodology

3.1 Sampling Strategy

As we mention above, the research findings reported in this paper are part of a larger research project in which we investigate CIO-CEO interaction patterns. Trust between the CIO and CEO (and CIO-CEO interaction patterns) in general are elusive concepts and not easily amenable to traditional forms of empirical research such as experiments or surveys. Therefore, we decided to conduct personal interviews with CIOs and CEOs to investigate our research topic in depth. Prior research (e.g., Feeny, Edwards, & Simpson, 1992) has shown that conducting interviews with both CIOs and CEOs may provide significant insight into the CIO/CEO relationship. However, as we know from previous research (Riedl, Kobler, & Roithmayr, 2008), it is not an easy task to convince top managers to serve as informants, particularly when doing so involves participating in a time-consuming qualitative interview. Thus, the sampling strategy is a critical factor for research success.

To gain access to CIOs and CEOs, we relied on the personal contacts of a well-connected former CIO of a multinational corporation listed at the Vienna Stock Exchange (this person expressed interest in and support for our research project). This supporter set up an initial list of 40 CIOs from medium-sized to large corporations across different industries located in Austria. We contacted all CIOs to explain the research project and our domain of interest (the supporter was not involved in the contacting process). Out of 40 CIOs, twelve CIOs (whose firms operate in twelve different industries) agreed to participate. All twelve of these CIOs talked to their respective CEOs about the study, and all twelve CEOs also agreed to serve as informants. Thus, the final sample in the present study comprised 24 top managers (all male) of twelve corporations (we interviewed all managers independently). The average number of employees of our sample organizations was 2,789 (min: 200, max: 7,411) and the average revenue in million Euros was
632 (min: 19, max: 1,909). Appendix B and C provide further details on the organizations and profiles of the participating top managers.

3.2 Interview Design

An a priori developed research model (related to the larger project, examination of CIO-CEO interaction patterns; note that this model does not have a specific focus on trust: it focuses on CIO-CEO communication processes) guided the interview design. Based on this model (see Hütter et al., 2016, for details), we derived an initial set of two interview guides: one for the CIO and one for the CEO (Appendix E summarizes both interview guides; readers can obtain the two original German language documents from the third author on request). Feeny et al. (1992) used a similar procedure to investigate CIO/CEO relationships.

Both interview guides were semi-structured and organized in different interview parts (the first section comprised general questions about the participating person and the corporation; the second section comprised free associations in order to capture the participants’ unstructured representations of CIO-CEO communication and the IT in their corporation; the third section comprised a series of open-ended questions plus some Likert-type scales (e.g., to grade the CEO perception of IT importance for the current and future business); and the fourth section provided an opportunity for each participant to add further comments). As it turned out, when analyzing the interview data, both the CIOs and CEOs provided a number of statements related to trust, including antecedents and consequences, and these statements form the basis of the research findings that we present in the following sections. Note that the interviewer already realized during data collection that both the CIOs and CEOs mentioned aspects related to trust. Hence, the interviewer, in line with the open-ended questions interview style, occasionally integrated questions directly related to trust into the interviews. As an example, the interviewer asked the CIO of Company H: “do you completely trust the CEO in what he is doing?” or “does the CEO trust you?”.

We asked a senior consultant from a multinational technology and consulting corporation with longstanding experience in our research area to examine the content validity of our interview guides by initially reviewing them. We used his comments and suggestions to revise the initial guides. We then piloted the revised guides with an additional CIO-CEO pair from an international corporation (not part of the sample in the main study). The first and second authors met with the executives of this corporation for the interview. During the interviews, these two authors took extensive notes on the entire interview process in order to enhance the accuracy of the data-collection instrument. After completing the interviews, each executive provided further feedback and comments about the instrument. This pre-test, along with a discussion of the pre-tested material with the third author of this paper, resulted in a second revision and adjustment of the interview guides, which we used in the main study. Benlian and Haffke (2016) applied a similar pre-testing logic to examine the bilateral nature and effects of CEO-CIO mutual understanding.

3.3 Data Collection

The first author conducted the entire data-collection process in the first half of 2014. During an initial orientation phase, the first author gave participants the opportunity to ask questions regarding the study’s purpose and assured them their confidentiality. In essence, in this orientation phase, the interviewer indicated that the study’s purpose involved examining CIO-CEO interaction patterns. Interviewees received a one-page information statement via email before the interviews: this statement included information on the following points: study purpose, planned interview duration of 60 minutes, assurance that we would use the data will only for scientific purposes in an anonymized form, and assurance that we would prove the interviewees with our research findings at the end of the project. The interviewer and the interviewees signed a confidentiality agreement to assure them that we would use the data only anonymously for research purposes. The interviewer conducted all interviews in German and tape-recorded them (all interviews took place in Austria). The interviewer worked to elicit each interviewee’s own views and ideas in order to better understand CIO-CEO interaction patterns. Rather than directing questions toward identifying the critical interaction attributes, the interviewer asked open-ended questions to give the interviewees the opportunity to speak in their own voice and to guide the discussion in particular directions of interest. Due to this interview style, the interviews lasted up to 60 minutes and provided a large amount of data in our domain of interest.
3.4 Data Analysis

Before analyzing the data, we transcribed all the tape-recorded interviews and simplified their accentuation in order to standardize the data and facilitate qualitative content analyses (Bryman & Bell, 2011). The tape-recorded interviews had a total duration of more than 13 hours (see Appendices B to E for more details).

For this paper, we analyzed the interview data (from the first, second, and third sections of the interview guides; see Section 3.2) in order to identify text passages that included information about mutual trust between the CIO and CEO. Moreover, based on our interpreting the interview texts, we focused on developing abstractions of the specific statements of our informants. Thus, one can best describe our approach as inductive, and, by omitting details of the specific statements, we derived these more general abstractions of insight. It follows that abstraction was a major principle underlying our data-analysis approach. In general, abstraction is an important principle of qualitative research. Dey (1993), in his book on qualitative data analysis, writes (p. 100): “We have to interpret our data in order to analyse it [and we have] to classify and compare the important or essential features of the phenomena we are studying. This involves a process of abstracting from the immense detail and complexity of our data those features which are most salient for our purpose.”. Moreover, he states (p. 100): “We think in generalities, we live in detail”.

Note that, while our data-analysis approach exhibits features of the grounded theory methodology (GTM), we did not exactly follow this approach. According to the original work by Glaser and Strauss (1967) and as later described in various grounded theory papers both in organizational research (e.g., Martin & Turner, 1986) and in IS (e.g., Vannoy & Salam, 2010), the GTM is rooted in an interpretivist philosophy and focuses on the development of theory through analyzing data (without pre-existing theoretical frameworks in mind). More specifically, with GTM, one typically begins with a question and then collects and reviews data. Next, ideas and concepts become apparent and are tagged with codes. As one collects and re-examines more data, one frequently groups codes into categories, which, in turn, form the foundation of a new theory. Considering this description, one can see that our inductive approach shares similarities with GTM yet differs because we did not formally apply the generalization levels of ideas, concepts, categories. Moreover, we do not claim that the major outcome of our investigation, the conceptual framework of CIO-CEO trust (see Figure 2), constitutes a full new theory as Whetten (1989) define. To mitigate potential bias due to our coding and structuring the transcripts, the third author of this paper, who had not taken part in collecting data and transcribing the interviews, performed the initial analysis (note that all authors developed the a priori developed research model). The third author read all transcripts and marked and coded the relevant phrases; this person also developed the first list of abstracted insights. Specifically, the third author (a senior scholar with significant experience in trust research) read the 206 pages of transcripts (108 pages that resulted from the CIO interviews and 98 pages that resulted from the CEO interviews; see Appendix D) and highlighted (with background color) relevant text passages from a trust perspective. The third author used no coding scheme because we assumed that an experienced trust researcher would be able to directly identify trust-relevant text passages when reading the interview transcripts. After the third author coded the data, the first author reviewed the results. In this review process, the first author focused on identifying potentially inappropriate coding and abstraction and on extracting additional text passages that contained useful information about mutual trust between the CIO and CEO. At the end of this review process, the three authors discussed all findings together, and, after some minor modifications and clarifications, reached agreement on the final results; that is, text passages that contained relevant information from a trust perspective (see Section 4) and abstracted insights (see Section 4 and Section 5). Figure 1 graphically summarizes the data-analysis process.
Figure 1. Summary of Planning, Data-collection, and Data-analysis Processes


4 Results

In this section, we present exemplary key statements from CEOs and CIOs. We structure the citations along three general factors that emerged as a result of the abstraction process. Thus, we inductively derived these three factors based on analyzing the interview transcripts.

The three general factors are:

- **Common language**: the fact that both the CEO and CIO have the capabilities to communicate with the counterpart in appropriate jargon, which usually requires that the CEO has some technical knowledge and the CIO some business knowledge.

- **CIO decision latitude**: the CIO’s freedom to largely act independently and to autonomously make strategic decisions without permanent and close control by the CEO, which implies that the CEO does not exert too much dominance on the CIO.

- **Information behavior**: all behavioral patterns related to information and communication in social interaction between the CEO and CIO, such as withholding or manipulating information.

4.1 Common Language

The first factor we identified as important for the CIO-CEO trust relationship is common language. Below we provide illustrative statements. One informant, for example, stated:

*In the course of our communication we have developed the intuition to see the important topics. The only factor which might negatively affect our communication effectivity is when we are unable to find a meeting date.... I completely trust him.* (CEO, company A)

As we describe next, two CIOs used the label “common language” to refer to what this CEO called “intuition”. Importantly, the comment of one informant suggests that non-bureaucratic and, hence, open communication and the CEO’s technical competence facilitate the establishment of shared knowledge.

*We have short official channels and the principle of open doors. Also, we get along well with each other, because partly we think in the same way und we speak a common language... He [the CEO] also raises the right counter questions, hence an issue can be reflected.... A common language certainly is a factor, it exists in our case, because we talk from technician to technician. Against this background we have a common basis.* [Note: The CEO of this organization has a university degree in computer science and hence a strong technical background.] (CIO, company C)

Another CIO explicitly mentioned a good personal and trusting relationship in the context of shared knowledge, and we interpret this statement to mean that “being on the same wavelength” (a form of sympathy; Wispé, 1991) also has a positive influence on shared knowledge.

*We have a good personal relation and a common language. Moreover, personal contact is critical, also to have a congenial relationship. In my opinion this increases efficiency.* (CIO, company D)

Altogether, our data suggest that a common language is an antecedent of mutual trust between a CEO and CIO. The higher the degree of common language, the higher the level of CIO-CEO trust. Next, we describe major results with respect to decision latitude.

4.2 CIO Decision Latitude

The second factor we identified as important for the CIO-CEO trust relationship is CIO decision latitude. Below we provide illustrative statements. One informant, for example, stated:

*It seems that [the CEO, the informant mentioned the CEO’s last name] has high confidence in me, and hence I have much decision latitude, and this, in turn, relieves him [of work].... He really tries to let staff members in whom he places trust do things on their own initiative. This cannot be taken for granted because many [other companies] face the issue of control. Therefore, I think that [the CEO] enables me to take responsibility for running my own department under basic conditions which he specifies.* (CIO, company B)
The statement of another informant, a CEO, indicated the potential negative effects of CEO dominance over the CIO.

*My dominance might affect the [communication] efficiency. In his situation [the CIO’s situation] I would not feel very comfortable, because our relationship is more like a father-son relationship. If I do not permit specific things, then I hinder him, and this would ultimately lead to a loss of [communication] efficiency.* (CEO, company F)

Another CEO indicated that he trusts his CIO and, therefore, gave him decision latitude. However, the following statement also suggests that the CIO did not fully meet the CEO’s expectations at least not with respect to realizing new ideas based on IT innovation.

*It bothers me that we only have one IT expert in the company. We have to recruit another person to better distribute the knowledge between them…. There is still potential for process automization where IT could be supportive. Partly, I do not have the knowledge to understand how this could be realized. It is the CIO’s responsibility to provide this knowledge. He ensures that everythings works out well, but hardly ever has new ideas.* (CEO, Company F)

Thus, while trust increased CIO decision latitude, the CIO did not properly use this latitude in this case, which potentially reduced the CEO’s trust in the CIO. We can explain this potential trust reduction by a negative perception of the CIO’s abilities, a major determinant of trustworthiness evaluations (Barki et al., 2015; Mayer et al., 1995).

Another CIO brought in an interesting perspective with respect to CIO decision latitude and trust. First, he indicated that he does not fully trust his CEO, and he also stated that the CEO does not fully trust him because the CEO does not have a high level of general trust; general trust, also referred to as disposition to trust, is a person’s tendency to demonstrate a consistent willingness to depend on others across a broad spectrum of contexts (Rotter, 1967). Second, the CIO, in his reflection on the CEO’s position, indicated that some degree of distrust might be reasonable. It follows that giving decision latitude to the CIO might be a good thing, but, at the same time, at least according to this informant, placing some degree of “general distrust” on the CIO seems to be justified predominantly because a CEO has responsibility for the entire firm.

*[Interviewer asked: Do you completely trust the CEO in what he is doing?] …not absolutely, in some areas more, in others less. [Interviewer asked: Does the CEO trust you?] No, his general trust is not really existent. However, his position eventually requires a certain degree of distrust.* (CIO, company H)

Another informant emphasized that his CEO totally trusts him, and he relates this circumstance to the fact that, while his CEO defines strategic objectives, he can decide how to reach these objectives. This result suggests that high levels of trust lead to a high degree of decision latitude for the trusted person.

*[Interviewer asked: Does the CEO completely trust you in what you are doing?] …yes, but sometimes I get the [CEO’s] message: “You have to slash costs by 5 percent”. However, it is largely up to me where I want to slash the costs.* (CIO, company L)

Altogether, our data suggest that a CEO’s trust in the CIO leads to an increase in CIO decision latitude and that CIOs generally perceive this trust as positive because humans naturally avoid being dominated by other people (Mehrabian & Russell, 1974). Moreover, our results suggest that too much control makes CIOs feel distrust. Significant levels of control, in turn, may be a consequence of a CEO’s low trust in the CIO, and, if people feel that others do not trust them, they typically reciprocate it by also placing little trust, or even distrust, in the other party (for a review, see Riedl & Javor, 2012). It follows that a sign of distrust by one party may lead to a vicious circle that impedes both the development of a reasonable level of mutual trust and resulting collaboration. However, this principle of reciprocation also holds true in a positive sense (Zak, Kurzban, & Matzner, 2004, 2005). Thus, an initial signal of trust may lead to reciprocal trust effects and, thereby, establish a foundation for efficient collaboration (Fehr, 2009). Next, we describe our results with respect to information behavior.

### 4.3 Information Behavior

The third factor we identified as important for the CIO-CEO trust relationship is information behavior. Below we provide illustrative statements. We start with two statements that suggest, on the one hand, that
CIOs proactively inform their CEOs about IT initiatives, but, on the other hand, that they should not expect that CEOs, or members of the top management board in general, to proactively inform them.

...proactively inform him [the CEO] or whether he asks for information if necessary. I provide information in a proactive way. However, it is my job to gather information from the CEO. (CIO, company A)

Basically it is mostly information that goes from me to the management board. What I miss from time to time is that business relevant information flows back to me. (CIO, company B)

However, one CEO in our sample had a fundamentally different view. This informant argued that information flow from the CEO to the CIO is highly important and, hence, a matter of course because, without information about strategic plans, it is difficult or even impossible for the CIO to align the IT initiatives with the organization’s general plans.

First and foremost my input, such as an explanation of the future development of our organizational structure, is needed so that the CIO can do his job. Then he is able to decide how he wants to advance the IT department and how to align it accordingly. (CEO, company J)

From the CEO perspective, it seems that specific forms of information behavior, particularly dissemination of information instead of withholding information, are critical for trust perceptions. Most likely, as the following statement suggests, a CEO might interpret a CIO’s withholding information as a deficit in openness, a factor which likely negatively affects perceived trust. One informant, for example, tellingly described the situation:

I have a straightforward and very clear leadership style, and hence openness is the most important thing. If my staff members have the same openness, then it is very easy for me to put the responsibility for something on them. The human factor is the most important thing to me in our collaboration. Also, it is critical to have a clear information policy to discuss problems, this is related to openness.... An area where he [the CIO] has some weaknesses is dissemination of information, despite the fact that he leads the information department, he has always been a bit hesitant [with respect to information dissemination]. (CEO, company B)

Our data also show that CIO reporting structure and information behavior are related concepts. The CIO reporting structure determines to which top manager a CIO reports. A reporting structure is a crucial decision that a company must make because an inappropriate reporting structure impedes a CIO’s work (Banker et al., 2011). Older research suggests that the CIO should always report directly to the CEO in order to promote the importance of IT, and to strengthen the CIO’s influence in the organization (Applegate & Elam, 1992; Raghunathan & Raghunathan, 1989; Watson, 1990). Reporting to the CFO (chief financial officer), in contrast to reporting to the CEO, has long been considered to signify that a CIO has a diminished role because organizations have chosen the CIO-CFO reporting structure in many cases as a means to monitor IT spending.

However, recent evidence challenges this notion: it suggests that a firm’s strategic positioning (differentiation or cost leadership) should be the primary determinant of the CIO reporting structure regardless of IT intensity or IT’s role in the organization (Banker et al., 2011). As a rule of thumb, differentiators should prefer a CIO-CEO reporting structure, while cost leaders should prefer a CIO-CFO reporting structure (Banker et al., 2011). However, while Banker et al. (2011) provide valuable insights into the effects of an (in)appropriate reporting structure, they do not consider possible implications for information behavior. The following CIO statement indicates that directly reporting to the CEO inhibits information filtering by other top managers to which a CIO may report (e.g., CFO):

The hierarchical position has a positive influence. [Note: The CIO reported directly to the CEO.] If there was a CFO in between, then communication would be more difficult, just because there would be no direct connection. I know other reporting structures, where no direct CIO-CEO communication line exists. If a CFO is in between, then it is possible that the CEO only receives information filtered by the CFO. Fortunately, this is not the case here. The direct contact with the CEO is critical…. If I were not able to discuss issues with the CEO, then it could be difficult, because he would eventually only receive blurred impressions. (CIO, company E)

Against the background of this statement, tone needs to consider how a CIO reporting structure may affect information behavior and trust.
With respect to a CEO’s trust in a CIO, one informant made a statement in which he highlighted a CIO’s communication competence, defined as the ability of the CIO to “communicate clearly, persuasively, and in business terms” (Smaltz et al., 2006, p. 211). This communication competence, a specific facet of ability (a component of perceived trustworthiness), cannot be taken for granted; business executives often complain that their CIOs lack these competencies and that this shortcoming can hinder the CIO’s ability to work effectively with the TMT on strategic objectives (Tan & Gallupe, 2006). Specifically, the informant made the following comment:

We communicate very efficiently. The CIO [the informant mentioned the CIO’s last name] is a highly structured person who gets things to the point, and I do not need to tediously ask around to understand things. (CEO, company K)

Our data also reveal that informal communication is important for a trusting CIO-CEO relationship. This finding confirms prior evidence reported in the CIO literature (Preston & Karahanna, 2004). Two corresponding statements substantiate this conclusion:

If we meet quickly in the hallway, we can also quickly exchange information. (CIO, company J)

Our communication is based on two pillars. First, there is a regular jour fixe in which we collect and discuss topics. In case of urgent matters (e.g., two years ago we had a license problem with a large software firm) we have a straightforward approach, where we can immediately discuss topics…. I think personal understanding for the communication partner constitutes a foundation of every conversation, independent of the communication partner…. He knows what I am interested in, and I know if something is bothering him. It is important that you are a good team. What is also important to me in general is to have a non-bureaucratic approach with respect to communication. No big structures. (CEO, company L)

Altogether, our data suggest that both a CEO’s and CIO’s information behavior may significantly affect mutual trust. First, specific forms of information behavior, particularly withholding of information, is likely to result in distrust perceptions. Second, it is important to consider that a formally implemented CIO reporting structure affects specific forms of information behavior. As an example, if a CIO does not directly report to the CEO (but to another executive such as the CFO), the information the CEO receives is likely to be filtered. One cannot rule out that this filtering process is done in such a way that the interests of the intermediate executive (e.g., CFO) are favored at the cost of other managers (e.g., CEO or CIO). Because benevolence (i.e., the feeling that one party means well toward the other party aside from an egocentric profit motive; Riedl & Javor, 2012, p. 64) has significant influence on trust perceptions in many situations (Barki et al., 2015; Mayer et al., 1995), information filtering, if observable, may strongly reduce trust in the person who has filtered the information. Third, we found that a CIO’s communication effectiveness is important for the CEO to perceive a CIO as trustworthy, particularly because competence affects trust perceptions (Barki et al. 2015; Mayer et al., 1995). Fourth, the possibility for informal communication fosters mutual trust.

4.4 Conceptual Framework

In this section, we describe the relationships among the most important factors that emerged from analyzing our interview data through a trust lens; namely, common language, CIO decision latitude, and information behavior (specifically, CIO and CEO information sharing). We summarize our theorizing in Figure 2 and present nine propositions. Our framework indicates that common language positively affects a CEO’s trust in a CIO and a CIO’s trust in a CEO. This finding is consistent with evidence that shows that CIOs who are proficient in speaking in business terms are more effective in creating a shared CIO-CEO vision than are those who use technical language or frame the issues in terms of technical implications (Feeny et al., 1992; Preston & Karahanna, 2009). Our study also revealed an important antecedent of common language; namely, non-bureaucratic and informal communication. Based on a CEO’s trust in a CIO, the CEO gives decision latitude to the CIO, and the CIO typically reciprocates this signal of trust with trust in turn. When a CEO highly trusts a CIO, CIOs and CEOs use open and trustworthy information behavior in their interactions. Similarly, a CIO who highly trusts a CEO fosters open CIO information behavior. As an example, mutual trust reduces the probability of detrimental information behaviors such as withholding information. Thus, we found that benevolent information behaviors, particularly information sharing and open communication (Wilson, 2010), increase mutual trust, which instigates a cycle of trustworthy CIO-CEO interaction.
Based on our conceptual framework in Figure 2, we formulate the following propositions:

- **P1**: Informal communication between a CIO and CEO positively affects the development of a common language.
- **P2**: Common language positively affects CEO trust in CIO.
- **P3**: Common language positively affects CIO trust in CEO.
- **P4**: CEO trust in CIO positively affects CIO decision latitude.
- **P5**: CEO trust in CIO positively affects CEO information sharing.
- **P6**: CIO decision latitude positively affects CIO trust in CEO.
- **P7**: CEO information sharing positively affects CIO trust in CEO.
- **P8**: CIO trust in CEO positively affects CIO information sharing.
- **P9**: CIO information sharing positively affects CEO trust in CIO.

5 Discussion of Findings in a Larger Theoretical Context

Based on analyzing the interview transcripts, we inductively derived three factors (i.e., common language, CIO decision latitude, and information behavior) that are major constructs in our conceptual framework of CIO-CEO trust (see Figure 2). In this section, we discuss the three constructs in the context of three established theories and, thereby, embed our major results in a larger theoretical context. As Figure 3 shows, we discuss common language in the context of social capital theory (Nahapet & Ghoshal, 1998), CIO decision latitude in the context of self-determination theory (Ryan & Deci, 2000), and information behavior in the context of network gatekeeping theory (Barzilai-Nahon, 2008).

We chose these three theories because 1) their “theoretical essence” concerns social relationships and 2) their underlying constructs can be integrated into one conceptual framework (see Figure 2). To identify relevant theories, we first screened the list of “theories in IS research” (which constitutes a compilation of “theoretical lenses to explore phenomena of interest” to IS scholars; for details, see https://aisnet.org/page/ISResearch). Second, we extended our search for relevant theories to related disciplines. In the list of “theories in IS research”, we identified social capital theory, and we found two complementary theories in the literature of related disciplines; namely, self-determination theory in social psychology and network gatekeeping theory in information science.
5.1 Social Capital Theory

Social capital theory (SCT) posits that networks of relationships constitute a valuable resource for individuals to conduct social affairs. According to Nahapiet and Ghoshal (1998), social capital refers to “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit [and] thus comprises both the network and the assets that may be mobilized through that network” (p. 243). They distinguish between three forms of social capital: structural (e.g., social interaction ties), cognitive (e.g., shared language and narratives), and relational (e.g., trust).

CIO-CEO interaction is a social activity. Thus, SCT is a theoretical lens through which one can fruitfully analyze this interaction. Wagner et al. (2014) write that “social capital theory is a useful theoretical foundation for understanding how business IT alignment works” (p. 242). Moreover, Karahanna and Preston (2013) indicate that “there is a dearth of studies examining social capital among members of the TMT” (p. 18). Thus, analyzing CIO-CEO interaction from a SCT perspective promises to deliver interesting findings.

Note that SCT constitutes a crucial theoretical foundation for examining various IS phenomena, including the relationship between the business and IT departments (van den Hooff & de Winter, 2011), knowledge sharing in IS development projects (Lee et al., 2015; Xiang, Lu, & Gupta, 2013), reading behavior on intra-organizational blogging systems (Li, Guo, Chen, & Luo, 2015), and usage behavior of Facebook fan pages (Lin & Lu, 2011). In the context of the present study, however, two IS papers that use SCT as a theoretical lens are of particular importance: Karahanna and Preston (2013) and Wagner et al. (2014).

Using survey data, Karahanna and Preston (2013) examined how Nahapiet and Ghoshal’s (1998) three dimensions of social capital (structural, cognitive, relational) affect alignment between an organization’s IT strategy and business strategy. Moreover, they hypothesized this business-IT alignment to mediate the relationship between CIO-TMT social capital and the organization’s financial performance. Their data supported the hypothesized relationships. In reflecting on their findings, Karahanna and Preston write (p. 37):

[T]he results of the study provide evidence that the relationship between the CIO and TMT, and specifically social capital, is consequential to organizational value creation and that IS strategic alignment is a mediating mechanism by which this occurs. This is consistent with social capital theory that suggests that knowledge integration, manifested as IS strategic alignment in our context, is an important mediating variable between social capital and organizational outcomes. Social capital facilitates knowledge exchange and combination, resulting in knowledge integration, which in turn influences organizational advantage.
A detailed look into the construct specification (see Karahanna and Preston, 2013, p. 54) reveals that they used shared language, in addition to shared cognition, to operationalize CIO-TMT cognitive social capital. Because they defined shared language as “the degree to which the CIO and TMT share a common language and terminology in their communication” (p. 54), this dimension resembles what we call common language in our conceptual framework of CIO-CEO trust (see Figure 2). Moreover, they operationalized CIO-TMT relational social capital based on the TMT’s trust in the CIO and CIO’s trust in the TMT. Karahanna and Preston’s (2013) results indicate that cognitive social capital positively influences relational social capital, which is in line with the qualitative findings of our study because we found common language to positively affect a CEO’s trust in a CIO and the CIO’s trust in the CIO (Figure 2).

What are possible explanations for cognitive social capital’s (common language’s) influence on relational social capital (trust)? Combining our results with Nahapiet and Ghoshal’s (1998, pp. 253-255) and Karahanna and Preston (2013, p. 22) theorizing, the following mechanism emerges: language is fundamental for the establishment and functioning of social relations; it is the means by which humans exchange information and ask questions. Thus, to the extent that people have a common language, including shared narratives such as shared stories and metaphors, it facilitates their potential to establish relationships and access information. Moreover, language influences perception (Berger & Luckman, 1966). In this context, Nahapiet and Ghoshal (1998, p. 253) write:

Codes organize sensory data into perceptual categories and provide a frame of reference for observing and interpreting our environment. Thus, language filters out of awareness those events for which terms do not exist in the language and filters in those activities for which terms do exist. Shared language, therefore, may provide a common conceptual apparatus for evaluating the likely benefits of exchange.

Based on this rationale, we can see Karahanna and Preston (2013) argue that “[s]hared language among organizational members allows for a sense of familiarity, which can foster trust among these members” (p. 22). Moreover, they argue that a major benefit of cognitive social capital is solidarity (defined as “the degree to which parties in a relationship subordinate their personal needs to the goals or the objectives of the relationship”, p. 22). Thus, shared language reduces a person’s perception that other social actors in a group will act opportunistically (e.g., withholding information) and, thereby, fosters mutual trust among group members. Our interview data supports this mechanism (see Figure 2).

In this context, we emphasize that we found that informal communication is a main enabler of mutual trust between a CIO and CEO and that common language mediates the relationship. Top managers’ formal communication typically focuses on scheduled meetings, whose content and outcomes are formally documented in protocols, and formalized reporting structures (e.g., a written report is sent from the CIO to the CEO on a monthly basis). This high degree of formalization is, at least partly, caused by legal regulations. However, research has established that the way in which individuals exchange information may significantly affect organizational productivity (e.g., Cross, Parker, & Sasson, 2003). Informal communication significantly affects the development of shared language and narratives, which are, in turn, a driver of mutual trust; formal communication, in contrast, typically does not have such positive effects on the development of shared language and narratives (Nahapiet & Ghoshal, 1998). This theorizing (i.e., informal communication → development of shared language and narratives → mutual trust) is supported by the organization science literature, which has demonstrated the importance of informal organization and informal communication for organizational performance. Krackhardt and Hanson (1993), for example, write: “If the formal organization is the skeleton of a company, the informal is the central nervous system driving the collective thought processes, actions, and reactions of its business units” (p. 104).

Wagner et al. (2014), in contrast to Karahanna and Preston (2013), used SCT to examine business-IT alignment at an operational level and not at a strategic level (i.e., among high-level executives such as CIOs and CEOs). Specifically, Wagner et al. surveyed managers in the banking industry responsible for the operations of the credit business. However, despite the fact that Wagner et al. had a different focus if compared to our study and the Karahanna and Preston study, Wagner et al. obtained interesting insights.

First, our own and Karahanna and Preston’s (2013) findings show that social capital development at a strategic level is a necessary but not a sufficient condition for business-IT alignment and resulting organizational success. It follows that the development of social capital (structural, cognitive, relational) is also important at an operational level. As a result, future studies could use our conceptual framework of CIO-CEO trust (Figure 2) as a basis to study trust between IT managers and users in different
organizational departments (and, thereby, move the focus from the strategic executive level to the operational level).

Second, Wagner et al. (2014) shows that communication per se (a form of structural social capital, which they measured based on frequency of meetings) does not guarantee business-IT alignment. Rather, the influence of structural social capital on business-IT alignment is mediated by cognitive and relational social capital (this finding confirms prior evidence that Karahanna and Preston (2013) report). Wagner et al. comment on this result as follows (p. 260):

\[T\]he effect of structural capital on business understanding is mediated through cognitive social capital. In essence, this means that meetings per se have no positive impact but that those meetings need to be effective in creating and maintaining a common language. The same argument holds for the relational dimension of social capital: Without trust and openness between business and IT, communication/meetings can hardly contribute to the creation of a mutual business-IT understanding.

Wagner et al. (2014) do not report the correlation between cognitive and relational social capital (see the structural model in Figure 2 of their paper, p. 253). Thus, future studies should determine whether cognitive social capital (common language) has a statistically significant effect on relational social capital (trust) at an operational level. If support was found for such an effect, it would extend Karahanna and Preston (2013) and our own findings from the strategic level (interaction among executive managers such as the CIO and CEO) to the operational level (e.g., interaction of IT managers with users).

5.2 Self-determination Theory

Self-determination theory (SDT) is an approach to human motivation and personality that highlights the importance of humans’ evolved inner resources for personality development and behavioral self-regulation (Ryan, Kuhl, & Deci, 1997). According to Ryan and Deci (2000), SDT’s “arena is the investigation of people’s inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration, as well as for the conditions that foster those positive processes” (p. 68). Research has identified three needs that are critical for facilitating optimal functioning of the natural human tendencies for growth and integration and for constructive social development and personal wellbeing: the need for competence, relatedness, and autonomy (for a review of papers in each domain, see Ryan and Deci, 2000).

In this paper, we focus on the need for autonomy because it relates directly to CIO decision latitude, an important factor in our conceptual framework (see Figure 2). Our findings indicate that a CEO’s trust in a CIO positively affects the CIO’s decision latitude, which, in turn, positively affects the CIO’s trust in the CEO (see Figure 2). SDT sheds light on mechanisms which help to better understand these findings and to recognize potential effects of high, or low, decision latitude.

Motivation concerns all aspects of activation and intention, and it is a major determinant of human behavior. Research distinguishes between intrinsic from extrinsic motivation: the former refers to “doing an activity for the inherent satisfaction of the activity itself”, while the latter refers to “the performance of an activity in order to attain some separable outcome” (Ryan & Deci, 2000, p. 71). Comparisons between people whose motivation is intrinsic and those whose motivation is extrinsic have shown that the former, if compared to the latter, have more interest, excitement, and confidence, which, in turn, often results in increased creativity, persistence, and performance (Deci & Ryan, 1991; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Moreover, research has shown high degrees of intrinsic motivation to result in increased vitality (Nix, Ryan, Manly, & Deci, 1999), self-esteem (Deci & Ryan, 1995), and wellbeing (Ryan, Deci, & Grolnick, 1995).

Based on these findings, we can better interpret our results in a way that goes beyond agency theory (AT), a major theory used to study collaboration in economic and organizational contexts (Eisenhardt, 1989). In essence, AT posits the existence of asymmetric information; that is, one party is better informed than the other party (e.g., the CIO is better informed about IT issues than the CEO). Against the background of this situation, the principal (in the example, the CEO) gives decision latitude to the agent (in the example, the CIO). To ensure that the agent behaves in the principal’s (best) interest, the latter, according to AT, should set incentives. Importantly, when deciding on these incentives, the anticipated costs of monitoring and controlling the agent must be considered (Sharma, 1997).
First, our study shows that a principal (CEO) does not only give decision latitude to an agent (CIO) due to information deficits as agency theory suggests. Rather, CEOs also give decision latitude to CIOs to pass on responsibility and to relieve themselves of work. Second, our results, if interpreted through a SDT lens, suggest that CEOs do not necessarily need incentives (such as monetary ones) to reduce opportunistic behaviors in CIOs. Rather, signals of trust from the CEO to the CIO are likely to be reciprocated by trustworthy and, hence, non-opportunistic behavior. Importantly, one important trust signal of the CEO is to give decision latitude to the CIO. SDT explains why such a signal of trust may lead to positive effects. As mentioned, autonomy (decision latitude) increases intrinsic motivation, which, in turn, positively affects creativity, persistence, performance, humanistic factors such as vitality, self-esteem, and wellbeing (Ryan & Deci, 2000).

Deci, Connell, and Ryan (1989) conducted a field study to test SDT (they investigated ―technicians and field managers…in the service division of a major office machine corporation‖, p. 581). Specifically, they explored the interpersonal work climate created by managers for their subordinates based on the degree to which managers’ interpersonal orientations supported subordinates’ self-determination. The authors conceptualized self-determination with three factors: support for autonomy, non-controlling positive feedback, and acknowledgment of the other’s perspective. They found that a management style characterized by appreciation of self-determination significantly correlated with “trust in supervisor” and “trust in corporation”; in discussing their findings, Deci et al. write: “The data indicate that managers’ interpersonal orientations did relate to the target variables, particularly to trust variables” (p. 588). What is the implication of this finding? It explains why CIO decision latitude may increase CIO trust in CEO (see Figure 2) and why a CEO’s level of control may decrease a CIO’s trust in the CEO.

In this context, we point to research that has shown that heavy job demands in combination with low decision latitude frequently lead to negative outcomes, particularly mental strain (a specific manifestation of stress) (see, e.g., Karasek, 1979). Considering the fact that IT managers and CIOs frequently experience heavy job demands (e.g., Moore, 2000; Spitz & Lee, 2012), it follows that CEOs should give high decision latitude to their CIOs in order to avoid negative consequences such as job stress. Moreover, Moore (2000) argues that the lack of autonomy that IT managers experience (measured with items such as “I get few opportunities, if any, to participate in management decisions that affect significant aspects of my job”, p. 166) is an important antecedent of work exhaustion (another manifestation of stress). Considering that research has established a negative relationship between stress and trust (Ditzen et al., 2009; Takahashi et al., 2005), a major implication for practice is that CIOs with low decision latitude are likely to experience higher levels of stress relative to CIOs with high decision latitude, and that such a situation likely results in lowered levels of trust (in other people or in the organization in general, see Deci et al., 1989). Altogether, ignoring the negative effects of low decision latitude (from reduced intrinsic motivation to reduced trust as SDT suggests) may harm organizations.

5.3 Network Gatekeeping Theory

Another topic that deserves close attention is information behavior and its relation to trust perceptions, a fact that recent statements in the CIO literature substantiate: “Organizational actors are more likely to exchange meaningful information, discuss and commit to organizational objectives, and form strategic partnerships with individuals that they trust…; trust facilitates the effective sharing of information” (Karahanna & Preston, 2013, p. 24). We show that trust affects information behavior (see Figure 2, particularly information sharing); this finding confirms Karahanna and Preston’s notion. Importantly, we also found that withholding information, a specific form of information behavior, may negatively affect trust perceptions.

While our data mainly relate to withholding information, other forms of information behavior in social interactions exist. Specifically, network gatekeeping theory (NGT) (Barzilai-Nahon, 2008) describes different forms of information behavior, several of which might play a critical role in CIO-CEO interactions and, thus, also influence trust perceptions and subsequent outcome measures such as CIO effectiveness, business-IT alignment, or even organizational performance.

In essence, NGT indicates that gatekeepers in networks (e.g., organizational networks) have three major functions: 1) to prevent the entrance of undesired information from outside, 2) to prevent the exit of information to the environment if disadvantageous for specific members of the inner circle of the network, and 3) to control information in the network. Researchers have used precursor forms of NGT (Lewin, 1947, 1951; Shoemaker, 1991) to explain changes in interaction among humans based on the interplay between power and information. Applications of NGT and its precursor forms are documented in different
IS domains, such as project management (Tushman & Katz, 1980) or knowledge management (Schultze & Boland, 2000).

NGT describes many specific information behaviors, such as selection, display, manipulation, repetition, disregard, and deletion of information (we refer the reader to Barzilai-Nahon 2008, Table 2, who describes a list of 13 information behaviors). Future research could focus on specific forms of information behavior and their influence on CIO-CEO trust. Importantly, as our data suggests, such examinations must not ignore the role of other top managers, a fact that holds particularly true if the CIO does not directly report to the CEO but to other executives such as the CFO. In such cases, it is possible that the intermediary executive (e.g., the CFO) acts as a gatekeeper, which may affect trust among the top managers and, hence, also outcome variables such as top management team effectiveness (e.g., operationalized via decision quality or acceptance of decisions). It will be rewarding to see what insights these potential studies reveal.

It is of particular importance that future research also examines the link between SCT and NGT. Evidence from IS development projects shows that social capital (particularly relational social capital, which researchers have typically operationalized based on trust measures; Karahanna & Preston, 2013) influences knowledge sharing, a construct operationalized based on items such as “I like to be kept fully informed of what my colleagues know” (Xiang et al., 2013, p. 1039). This influence is either exerted directly (Lee, Park, & Lee, 2015) or indirectly via shared mental models (Xiang et al., 2013); note that shared mental models imply that social actors in a group can understand and predict the behavior of other group members based on common interpretation of group processes and goals (Xiang et al., 2013, p. 1026). Both studies (Lee et al., 2015; Xiang et al., 2013) also show that knowledge sharing predicts team performance. Thus, connecting SCT and NGT has important practical implications predominantly because this connection explains performance effects. A look at our conceptual framework (Figure 2) reveals that the link between SCT (see CEO trust in CIO and CIO trust in CEO) and NGT (see CEO information behavior and CIO information behavior) is inherent in our framework. Thus, interpretation of findings reported in the extant literature (Lee et al., 2015, Xiang et al., 2013) together with our results (see Figure 2) suggests a direct link between SCT and NGT. Future research should test this proposition.

6 Limitations and Future Research

In this explorative study, we investigated an important facet of the CIO-CEO relationship; namely, mutual trust. However, we do not yet see this work as complete (as we discuss in Section 5), nor do we consider it to be without limitations.

First, while our sample size of 24 top managers is relatively large and, hence, probably covers important facets of the CIO-CEO trust relationship, a different sample of informants might lead to different findings due possibly to cultural or legal influences (note that we are not aware of a peer-reviewed scientific interview study on the CIO-CEO relationship that has a larger sample size). We emphasize that we conducted this study in Austria, and it is possible that cultural influences (e.g., Preston et al. 2006) or legal regulations may result in further, not necessarily contradictory, findings. Hence, it is likely that further antecedents and facilitators of trust that future examinations will reveal likely complement a common language, CIO decision latitude, and information behavior. In this context, we indicate that generalizability in our research context mainly relates to what Lee and Baskerville (2003) term “generalizing from data to description” because we used an inductive approach to develop abstracted insights.

As an example, international surveys (e.g., conducted by World Values Survey) frequently measure “interpersonal trust”. The measure of trust used is the percentage of respondents in a country who agree that “most people can be trusted” against the alternative that “you can’t be too careful in dealing with people” (Zak & Knack, 2001, p. 306). A related and frequently used measure is the trust index (TI), where \[ TI = 100 + (\% \text{ “most people can be trusted”}) - (\% \text{ “you can’t be too careful in dealing with people”}) \]. Scores above 100 indicate that a majority of people in a country trust other people, while scores below 100 indicate that a majority of people think that members of a society cannot be too careful in dealing with other people. Results of international surveys (data were mostly collected in the 2000s) indicate that Scandinavian countries have the highest trust scores (> 130). In contrast, Austria has a score of 70.2. The scores of other example countries are: Germany (75.8), Switzerland (107.4), USA (78.8), Australia (92.4), and Turkey (10.2) (for details, see http://www.jdsurvey.net/). These results substantiate our call for others to replicate our study in other countries because cultural, political, legal, and other factors may affect peoples’ trust perceptions in a specific country.
Second, we emphasize that this macro-perspective (i.e., country level) should be complemented by a micro-perspective, which would consider an individual's personality. Research indicates that trust behavior is also influenced by personality traits such as risk aversion or betrayal sensitivity (Thiellmann & Hilbig, 2015). It follows that future studies on CIO-CEO trust should measure such personality traits and correlate them with trust beliefs and intentions and trust-related behaviors (e.g., information sharing). Based on what we know from prior studies (see Thiellmann & Hilbig, 2015), we surmise that higher levels of risk aversion and betrayal sensitivity will predict lower levels of trust beliefs and intentions and lower levels of trust-related behaviors.

Third, in our study, the unit of analysis is each individual interview, and we inductively generalized our findings to develop a conceptual framework of CIO-CEO trust (see Figure 2). An alternative approach would have been to collect trust-related data on each CEO’s opinions, each CIO’s perceptions of the CEO’s opinions, the CIO’s opinions, and the CEO’s perceptions of the CIO’s opinions. We recommend such a research design for future work. A recent research example that used a similar research design (specifically, a matched-pair survey design) is Benlian and Haffke’s (2016) examination of the bilateral nature and effects of CEO-CIO mutual understanding. This examination, along with related research on dyadic trust perceptions (Yakovleva, Reilly, & Werko, 2010), may serve as a conceptual basis for the design of future studies. Among other reasons, one needs to consider Benlian and Haffke (2016) study because they found that CIOs’ understanding of their CEOs plays a more critical role in predicting the quality of CEO-CIO collaboration than CEOs’ understanding of their CIOs. This finding suggests that, in order to establish a trusting relationship with the CEO, a CIO should make the first step to signal trust and, thereby, instigate the development of mutual trust based on the principle of reciprocity (Zak et al., 2004, 2005). Future research should test this proposition.

Fourth, we cannot separate how we interpreted the facts and our resulting conceptual framework (see Figure 2) from our own, sometimes even unconscious, beliefs. Michael Polanyi (1891–1976), a Hungarian-British polymath, argues in his book Personal Knowledge that objectivity is a false ideal because all knowledge claims rely, at least to some extent, on personal judgments (Polanyi, 1958). Similar notions can be found in the IS literature. Walsham (2006), quoting the American anthropologist Clifford Geertz (1926–2006), tellingly writes: “What we call our data are really our own constructions of other people’s constructions [here the interviewed CEOs and CIOs] of what they and their compatriots are up to” (p. 320). Considering that our work is idiographic in nature, it is critical that future studies, both qualitative and quantitative in nature, complement and perhaps revise our findings.

Fifth, in Section 3, we outline that, out of 40 CIOs that we contacted, twelve agreed to serve as informants, and all twelve of these CIOs talked to their respective CEOs about the study, and all twelve CEOs also agreed to serve as informants. Hence, we can assume that our sample mainly reflects CIO-CEO pairs who have relatively good relationships and, hence, have a relatively high level of mutual trust. A post hoc analysis of data that we collected in the context of the larger research project shows that this assumption is true. Specifically, we collected data on the CIOs’ assessment of the CEOs’ ability, benevolence, and integrity (the three trustworthiness components) and vice versa based on a seven-point scale (1 = lowest value and 7 = highest value). The results were as follows (M/SD): ability CIO: 6.6/0.5, ability CEO: 6.4/0.7, benevolence CIO: 6.4/0.8, benevolence CEO: 6.8/0.6, integrity CIO: 6.7/0.9. Thus, based on our informant-selection procedure and the measured trust values, we stress that our findings may not apply to CIO-CEO pairs with low levels of trust (despite the fact that several informants of the present study provided comments on antecedents and consequences of low trust levels).

In this context, we note that neuroIS research has shown that trust and distrust perceptions activate different brain areas (Dimoka, 2010; Riedl, Hubert, & Kenning, 2010). This finding suggests that trust and distrust are not the two ends of one single continuum but rather constitute two different constructs, each of which may have different antecedents and consequences. It follows that future studies on CIO-CEO trust could be based on a 2 (CIO, CEO) × 4 (trust: high, low; distrust: high, low) factorial design. However, we

---

3 Also, we collected data on the CIOs’ and CEOs’ disposition to trust (self-reported, based on a five-item instrument developed by Gefen, 2000, p. 735). We measured each item (e.g., “I generally trust other people.”) with a seven-point scale that ranged from strongly disagree (1) to strongly agree (7). It follows that the maximum disposition to trust was 35 and the minimum was 5. The results for disposition to trust were as follows (M/SD): CIOs (27.4/3.9, max: 33, min: 19) and CEOs (27.1/4.6, max: 32, min: 17). Thus, the analysis showed no extreme outliers (i.e., values smaller or larger than 3 × SD: Barnett & Lewis, 1994), and the disposition to trust values are comparable to results reported in the IS literature (e.g., Riedl et al., 2010).
foresee that it might be extremely difficult to get access to a sample of CIO-CEO pairs who provide their honest opinion on a highly sensitive topic such as distrust, which we even consider as more sensitive than trust. Hence, surveys and interviews are presumably not the best methods to study CIO-CEO distrust. Rather, we recommend an ethnographic approach because direct observations in organizations are likely to reveal (more) credible research findings on a highly sensitive issue such as distrust among members of a firm’s management board.

Finally, because we specifically examined CIO-CEO trust, an open question concerns whether the results we present in this paper also pertain to a CIO’s trust in 1) other executives (e.g., CFO) or 2) executives in general. We call for broad participation in investigating this important question in future studies.

7 Concluding Comments

Despite its obvious importance, trust between the CIO and other top managers, particularly the CEO, has received little attention in IS research. This paucity of CIO-CEO trust research is problematic considering that trust is critical for successful business-IT alignment (Karahanna & Preston, 2013; Wagner et al., 2014). Against this research background, we analyze a rich dataset that we collected in the context of a larger research project that examines CIO-CEO interaction patterns. Specifically, we analyze the transcripts of 12 CEO and 12 CIO interviews. We identify common language, CIO decision latitude, and information behavior as crucial factors in the CIO-CEO trust process and, thereby, complement the view of existing studies in this research domain. Based on our findings, we develop a conceptual framework of CIO-CEO trust. Moreover, we discuss the three major factors of our framework in the context of established theories (social capital theory: common language, self-determination theory: dedicion latitude, network gatekeeping theory: information behavior) and, thereby, embed our major results in a larger theoretical context. We hope that our study instigates future examinations into the nature of trust in CIO interaction with other top managers.

Acknowledgments

We thank the twelve CEOs and twelve CIOs who spent their valuable time and served as informants. Also, we thank two anonymous reviewers, as well as the editor, for their work in providing guidance on ways to improve the paper.
References


Peppard, J., Edwards, Ch., & Lambert, R. (2011). Clarifying the ambiguous role of the CIO. *MIS Quarterly Executive, 10*(1), 31-44.


Appendix A: Statements in the CIO Literature Related to Trust

In addition to the four discussed studies (see Section 2.2"), other statements in the CIO literature also substantiate the conclusion that 1) trust is a key determinant of CIO success and resulting organizational performance (see statements 1-6) and 2) important antecedents and facilitators of trust in the CIO domain do exist (see statements 7-12). We identified these statements based on a systematic keyword analysis ("trust") of the 110 CIO papers in our literature database.

<table>
<thead>
<tr>
<th>Source</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enns, Huff, &amp; Higgins (2003, p. 168)</td>
<td>…trust was a key factor underlying the success of personal appeal behaviors. If the CIO had a good track record with IS projects and had established a relationship of trust with a peer, then it was likely that the peer would be swayed by personal appeal behaviors. As one of the executives remarked, “a lot of people do not understand much about technology; it costs a lot of money, and they want someone they can trust”.</td>
</tr>
<tr>
<td>2. Kaarst-Brown (2005, p. 297)</td>
<td>In some cases, IT projects may need to be „railroaded“ through, especially when competitive advantage or organizational survival is at stake. However, it’s better to encourage involvement and trust these business folks to see the weaknesses and risks in plans. They might even become strong supporters.</td>
</tr>
<tr>
<td>3. Kettinger, Zhang, &amp; Marchand (2011, p. 158)</td>
<td>Leadership scholars… consider leadership as a function of being aware of yourself and your situation (sensemaking), having a vision that is well communicated (charting the map), building trust and influence among colleagues and subordinates, and taking effective action toward your vision (mobilizing).</td>
</tr>
<tr>
<td>4. Preston &amp; Karahanna (2004, p. 475)</td>
<td>…the CIO should focus on formal mechanisms rather than focusing on engaging in social interaction with the TMT to build SMMs [shared mental models]. However, informal interactions may be important in terms of building trusting relationships that may facilitate the development of SMMs.</td>
</tr>
<tr>
<td>5. Preston, Karahanna, &amp; Rowe (2006, p. 202/203)</td>
<td>…a CIO’s credibility, communication ability, and political savvy, as well as the level of trust between the CIO and the TMT may all be important antecedents of shared understanding and their relative importance may be culturally dependent.</td>
</tr>
<tr>
<td>6. Watts &amp; Henderson (2006, p. 137)</td>
<td>Perceived integrity is a necessary precursor to fostering strong relationships…. Trust generates commitment, and commitment ensures effort that is cooperative and innovative.</td>
</tr>
<tr>
<td>7. Watts &amp; Henderson (2006, p. 137)</td>
<td>…credibility helps to foster personal trust between the CIO and other top execs [executives], including the CEO.</td>
</tr>
<tr>
<td>8. Johnson &amp; Lederer (2005, p. 233)</td>
<td>…it is reasonable to expect that frequent communication between the CEO and CIO would result in exchanges of information about the organization’s future domain. Frequent exchanges would promote mutual trust and understanding about the organization’s strategy and how IT could be deployed to support or enable that strategy.</td>
</tr>
<tr>
<td>9. Stemberger, Manfreda, &amp; Kovacic (2011, p. 430)</td>
<td>…membership of the top management board and informal interactions with it also strengthen the business knowledge of a CIO … and increase the trusting relationship the CIO has with top management.</td>
</tr>
<tr>
<td>10. Peppard (2010, p. 86)</td>
<td>A leading European academic suggested that a CIO can assess how the CIO’s contribution is viewed: “If the CEO of your business unit is putting together people for golf and business discussion over the weekend, would he consider the CIO amongst one of those foursomes, not because the CIO is a golf player but because at the 19th hole, there’s going to be a lot of business discussion and the CIO has to be a trusted member of the team—a colleague, not just a supporter of the team.”</td>
</tr>
</tbody>
</table>
Table A1. Statements in the CIO Literature Related to Trust

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>This paper argues that expertise alone does not inspire trust and credibility. Rather, successful IT executives work on their trustworthiness and build good relationships with non-IT people. Based on this argument, the authors describe antecedents and facilitators of trust, including 1) similarity and likability (i.e., humans tend to trust similar humans more than dissimilar ones; for example similarities that positively affect likability are common interests and language), 2) prolonged interaction (i.e., frequent meetings, particularly one-to-one meetings, promote development of trust), 3) appropriate behavior (i.e., behaving according to others’ expectations increases trust), and 4) consistent behavior (i.e., behaving consistently makes people more predictable and hence trustworthy). In the concluding section of their article, the authors offer a list of nine factors that IT people should consider to build trust, such as “establish[ing] regular, one-on-one meetings with line managers” or “us[ing] business jargon [and] not…technical jargon that customers do not already use correctly”.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Preston &amp; Karahanna (2009, p. 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The authors state that many business executives do not have enough IT knowledge to appropriately evaluate the value of IT investments; hence, it is often unclear what may be achievable through IT adoption. Against the background of this knowledge deficit, CEOs and other top managers must trust their CIOs. Thus, trust is a mechanism to compensate for knowledge deficit. From a CIO perspective, developing and maintaining a trusting relationship with the TMT is critical. The authors describe four actions to develop trust with the TMT: CIOs could 1) engage in social networking with other executives, 2) establish personal credibility through successful IT projects, 3) avoid opportunistic behavior (i.e., behavior that benefits IT at the expense of other departments within the organization), and 4) manage non-IT people’s expectations (which are often unrealistic).</td>
</tr>
</tbody>
</table>
Appendix B: Organizational Characteristics of the Sample

Table B1. Organizational Characteristics of the Sample

<table>
<thead>
<tr>
<th>Corp. ID</th>
<th>Industry</th>
<th>Number of employees*</th>
<th>Revenue in € millions*</th>
<th>Top management consists of*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Manufacturing</td>
<td>1,500</td>
<td>800</td>
<td>CEO, CFO, CTO</td>
</tr>
<tr>
<td>B</td>
<td>Manufacturing</td>
<td>800</td>
<td>250</td>
<td>CEO, CTO</td>
</tr>
<tr>
<td>C</td>
<td>Manufacturing</td>
<td>500</td>
<td>150</td>
<td>CEO, CFO</td>
</tr>
<tr>
<td>D</td>
<td>Retail Trade</td>
<td>2,500</td>
<td>1,000</td>
<td>CEO, CFO, 4 x head of division</td>
</tr>
<tr>
<td>E</td>
<td>Retail Trade</td>
<td>3,500</td>
<td>500</td>
<td>CEO, COO, CMO</td>
</tr>
<tr>
<td>F</td>
<td>Manufacturing</td>
<td>200</td>
<td>20</td>
<td>CEO</td>
</tr>
<tr>
<td>G</td>
<td>Manufacturing</td>
<td>6,500</td>
<td>2,000</td>
<td>CEO, CFO, COO, CCO</td>
</tr>
<tr>
<td>H</td>
<td>Manufacturing</td>
<td>400</td>
<td>80</td>
<td>CEO</td>
</tr>
<tr>
<td>I</td>
<td>Manufacturing</td>
<td>6,000</td>
<td>1,000</td>
<td>CEO, CFO, COO, CMO</td>
</tr>
<tr>
<td>J</td>
<td>Manufacturing</td>
<td>2,500</td>
<td>800</td>
<td>CEO, CFO, CTO</td>
</tr>
<tr>
<td>K</td>
<td>Manufacturing</td>
<td>1,500</td>
<td>250</td>
<td>CEO</td>
</tr>
<tr>
<td>L</td>
<td>Manufacturing</td>
<td>7,500</td>
<td>1,000</td>
<td>CEO, COO, CMO</td>
</tr>
</tbody>
</table>

Note: * data collected from the annual reports. CCO = chief commercial officer, CEO = chief executive officer, CMO = chief marketing and sales officer, COO = chief operating officer, CTO = chief technology officer. In order to guarantee anonymity, classification of industry is based on the highest possible abstraction level; also, we rounded the number of employees and revenue.
Appendix C: Profile of the Participating Top Managers

Table C1. Profile of the Participating Top Managers

<table>
<thead>
<tr>
<th>Educational level</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctorate</td>
<td>1</td>
<td>3</td>
<td>8.3 %</td>
<td>25.0 %</td>
</tr>
<tr>
<td>Diploma and master</td>
<td>8</td>
<td>6</td>
<td>66.7 %</td>
<td>50.0 %</td>
</tr>
<tr>
<td>Bachelor</td>
<td>0</td>
<td>0</td>
<td>0.0 %</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Lower educational level</td>
<td>3</td>
<td>3</td>
<td>25.0 %</td>
<td>25.0 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational field</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer science</td>
<td>2</td>
<td>1</td>
<td>16.7 %</td>
<td>8.3 %</td>
</tr>
<tr>
<td>Economic sciences</td>
<td>3</td>
<td>6</td>
<td>25.0 %</td>
<td>50.0 %</td>
</tr>
<tr>
<td>Engineering sciences</td>
<td>2</td>
<td>2</td>
<td>16.7 %</td>
<td>16.7 %</td>
</tr>
<tr>
<td>Information systems</td>
<td>4</td>
<td>1</td>
<td>33.3 %</td>
<td>8.3 %</td>
</tr>
<tr>
<td>Law</td>
<td>0</td>
<td>2</td>
<td>0.0 %</td>
<td>16.7 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years of employment in current organization</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 or more</td>
<td>3</td>
<td>2</td>
<td>25.0 %</td>
<td>16.7 %</td>
</tr>
<tr>
<td>10 to 12</td>
<td>1</td>
<td>1</td>
<td>8.3 %</td>
<td>8.3 %</td>
</tr>
<tr>
<td>7 to 9</td>
<td>4</td>
<td>1</td>
<td>33.3 %</td>
<td>8.3 %</td>
</tr>
<tr>
<td>4 to 6</td>
<td>3</td>
<td>5</td>
<td>25.0 %</td>
<td>41.7 %</td>
</tr>
<tr>
<td>3 or fewer</td>
<td>1</td>
<td>3</td>
<td>8.3 %</td>
<td>25.0 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Former field of work</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>1</td>
<td>7</td>
<td>8.3 %</td>
<td>58.3 %</td>
</tr>
<tr>
<td>IT</td>
<td>10</td>
<td>3</td>
<td>83.4 %</td>
<td>25.0 %</td>
</tr>
<tr>
<td>Technical</td>
<td>1</td>
<td>2</td>
<td>8.3 %</td>
<td>16.7 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of recruitment</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal hire</td>
<td>5</td>
<td>8</td>
<td>41.7 %</td>
<td>66.7 %</td>
</tr>
<tr>
<td>External hire</td>
<td>7</td>
<td>4</td>
<td>58.3 %</td>
<td>33.3 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>CIO absolute frequency</th>
<th>CEO absolute frequency</th>
<th>CIO relative frequency</th>
<th>CEO relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>12</td>
<td>100.0 %</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>0</td>
<td>0.0 %</td>
<td>0.0 %</td>
</tr>
</tbody>
</table>
Appendix D: CIO/CEO Interviews and Transcripts Length

<table>
<thead>
<tr>
<th>Corp. ID</th>
<th>CIO interview length (h:m:s)</th>
<th>CIO transcript page length*</th>
<th>CEO interview length (h:m:s)</th>
<th>CEO transcript page length*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>00:47:41</td>
<td>11.5</td>
<td>00:44:46</td>
<td>10.5</td>
</tr>
<tr>
<td>B</td>
<td>00:32:30</td>
<td>10.5</td>
<td>00:36:44</td>
<td>10.0</td>
</tr>
<tr>
<td>C</td>
<td>00:50:09</td>
<td>9.0</td>
<td>00:39:25</td>
<td>8.0</td>
</tr>
<tr>
<td>D</td>
<td>00:42:18</td>
<td>9.0</td>
<td>00:27:16</td>
<td>8.0</td>
</tr>
<tr>
<td>E</td>
<td>00:36:45</td>
<td>9.5</td>
<td>00:51:30</td>
<td>8.5</td>
</tr>
<tr>
<td>F</td>
<td>00:15:19</td>
<td>7.5</td>
<td>00:20:15</td>
<td>7.5</td>
</tr>
<tr>
<td>G</td>
<td>00:48:35</td>
<td>10.5</td>
<td>00:19:26</td>
<td>7.5</td>
</tr>
<tr>
<td>H</td>
<td>00:22:40</td>
<td>7.0</td>
<td>00:20:46</td>
<td>7.5</td>
</tr>
<tr>
<td>I</td>
<td>00:39:30</td>
<td>9.5</td>
<td>00:21:32</td>
<td>8.0</td>
</tr>
<tr>
<td>J</td>
<td>00:28:01</td>
<td>8.0</td>
<td>00:28:22</td>
<td>8.0</td>
</tr>
<tr>
<td>K</td>
<td>00:29:00</td>
<td>8.5</td>
<td>00:16:50</td>
<td>7.0</td>
</tr>
<tr>
<td>L</td>
<td>00:48:44</td>
<td>7.5</td>
<td>00:16:05</td>
<td>7.5</td>
</tr>
<tr>
<td>Sum</td>
<td>7:21:12</td>
<td>108.0</td>
<td>5:42:57</td>
<td>98.0</td>
</tr>
</tbody>
</table>

* We used Arial with size of 11 points and line spacing at 1.5 for all transcripts.
Appendix E: CIO/CEO Interview Guide

Please note that the two original German language interview guides (CIO, CEO) are available from the third author on request.

Part 1: General questions regarding the interviewee and interviewee’s company
1.1) Only CIO: What is your current position called?
1.2) How many years have you been working in your current position? What position did you have before?
1.3) Only CIO: Are you a member of the top management board? If not, at which management level do you work?
1.4) Only CIO: To which manager do you report?
1.5) Only CIO: Are you also responsible for other functions beside IT (e.g., organizational development)?
1.6) What is the highest qualification you hold? In which area do you have this qualification?
1.7) How do you define the term information technology (IT) in your company?

Part 2: Associations
2.1) When you think about IT within your organization, what do you spontaneously associate with it? (max. five terms)
2.2) When you think about the communication with your CEO/CIO, what do you spontaneously associate with it? (max. five terms)

Part 3: Main part
3.1a) How do you rate the effectiveness of your communication with your CEO/CIO?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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3.1b) Please give an example that illustrates your point of view.

3.2) Do you communicate directly with your CEO/CIO about IT issues? If not, with whom do you communicate about them? If so, with who else do you communicate about it?

3.3) How often do you communicate with your CEO/CIO about IT issues during a typical month? How frequently communication take place (in your opinion)?

3.4) Which communication channels do you use with your CEO/CIO (face-to-face, videoconference, telephone, e-mail, memo)? Please estimate their frequency of use (as a percentage).

3.5) About which IT topics do you communicate with your CEO/CIO?

3.6) What influences the effectiveness of the communication with the CEO/CIO from your point of view? What could be improved?

3.7a) How do you rate the importance of IT for your business?

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3.7b) Please describe how IT supports the business areas and strategies of your company?
3.7c) How do you rate the future importance of IT for your business?

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3.7d) Please describe how IT should support the business areas and strategies of your company in the future?

3.8) How would an IT breakdown affect the business activities of your company? In the short-term? In the long-term?

3.9) Please describe the contribution of IT to your business success (in your opinion)?

3.10) How do you measure the performance of IT?

3.11) Who decides whether an investment in IT is made or not? How is it decided?

3.12) Only CEO: Do you participate in IT discussions about IT use within the organization? If so, how?

3.13) Only CEO: How satisfied you are with the organization’s IT?

3.14) Only CEO: How strong was your influence on the selection of the CIO?

**Part 4: Summary and conclusion**

Have we forgotten something important? Do you have any questions? Thank you.
About the Authors

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