AN EXPERT VIEW ON CHALLENGES IN MANAGING IT COSTS IN THE DIGITAL AGE

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ABSTRACT

In the digital age, information technology (IT) is a strategic asset for organizations. As a result, the IT costs are rising, and the cost-effective management of IT is crucial. Nevertheless, organizations still face major challenges and former studies lack comprehensiveness and depth. The goal of this paper is to generate a deep and holistic view on current management challenges of IT costs. In 15 expert interviews, we identify 23 challenges divided into 7 categories. The main challenges are to ensure transparency on IT cost information, to demonstrate the business impact of IT as well as to change the mindset for the value of IT and overcoming them requires attention to their interactions. Hence, this paper leads to a better understanding of the issues that IT cost management (ITCM) faces in the digital age and builds a base for future research.

KEYWORDS

IT Cost Management, Expert Interviews, Challenges, IT Governance, COBIT Components

1. INTRODUCTION

The increasing demands on companies in terms of digitalization require companies to make strategic investments in technology (Capgemini, 2022). As a result, IT costs have been rising steadily in recent years and are forecast to increase by a further 5.1% in 2023 (Gartner Inc., 2022b). This necessitates IT responsible to choose the right digital initiatives and thereby achieve cost-effectiveness (Gartner Inc., 2022a). Cost-effective use of IT is a goal of IT Governance (Weill & Ross, 2004) and requires a functioning IT cost management (ITCM). It ensures that organizations control IT costs, support decisions on IT investments, IT outsourcing, and IT innovation, and establish a cost-effective IT deployment (Egle, 2008). However, a study of 501 IT managers in 2022 states that 81% of the respondents still have difficulties to ensure spend-efficiency and avoid waste (Flexera, 2022). This is why we aim to understand the specific challenges that organizations face in the digital age when managing IT costs.

The exchange with practice is substantial for academia in order to create knowledge and develop new theoretical approaches that address existing challenges (Strecker & Kargl, 2009). Earlier studies investigate integration deficits between practice and theory in the field of IT cost management: Strecker and Kargl (2009) as well as Walter and Spitta (2004) show that existing research either does not cover the problem or lack application in practice. Recent research develops new approaches on cloud costs and chargeback (Ajeh et al., 2014; Stefanov et al., 2012) and the pricing of new collaboration models or platforms (Grytz et al., 2020). However, it does not face the challenges of the cost management discipline in times of digital transformation. We therefore conduct expert interviews to generate a deep and holistic view on the management challenges of IT costs. Thereby, we contribute to scientific research by shedding light on current challenges and consequently, by highlighting future research directions to solve these challenges. Additionally, practitioners gain awareness through the holistic view of the challenges.

This paper is structured as follows: First, we introduce the research field of ITCM. We then show our research method, which comprises expert interviews and a qualitative analysis. Finally, we present our findings, posit propositions for future research and draw a conclusion.

2. EVOLVING FIELD OF IT COST MANAGEMENT

The discipline of ITCM has a long research history reacting to different challenges often triggered by external influences or transformations such as increasing portions of IT costs (Berghout & Renkema, 2001) or the evolving IT landscape (Drury, 1998; Grytz & Krohn-Grimberghe, 2018b). In the last decade, researchers especially focused on the identification of root causes and drivers of IT costs (Glissmann & Ludwig, 2013; Hamel et al., 2012; Riedinger et al., 2022), the pricing of digital goods and cloud services (Ajeh et al., 2014; Huang & Sundararajan, 2011) as well as the development of cost allocation mechanisms for BI&A systems (Grytz et al., 2020). In order to identify research directions and react to transformations, researchers focus on expert opinions and perform interviews with multinational business groups to determine ITCM requirements (Hamel et al. 2011) or conduct surveys to identify the major challenges in BI&A cost accounting (Grytz & Krohn-Grimberghe, 2018a). Thus, they focus on specific company sizes or subsections of ITCM lacking a holistic perspective of the discipline and the current management challenges. In contrast, latest practical studies (Flexera, 2022; Foundry, 2022) identify the challenges and trends for IT management using quantitative surveys. They include questions on challenges in ITCM but are limited to a predefined subset of questions and assessment scales which impedes acquiring more detailed and in-depth information (Adams & Cox, 2012). "As the pace of change accelerates" (Flexera, 2022) in the digital age, organizations need to gain a deep insight in IT and IT spend in order to keep up. However, the research community lacks a deep and holistic investigation of the current challenges from a broad practical perspective to derive relevant directions for the discipline in the digital age. These shortcomings lead to the research question of this paper: *what are the challenges of IT cost management in the digital age?*

3. RESEARCH METHOD

Academics apply expert interviews to obtain a comprehensive picture of a phenomenon in practice (Saunders, 2019). To understand the changes and challenges of ITCM in practice, we carried out 15 expert interviews (Meuser & Nagel, 2009; Saunders, 2019). The interviews were semi-structured and in-depth (Meuser & Nagel, 2009; Saunders, 2019) to have the opportunity to ask more detailed follow-up questions during the conversation. The leading question was: *which challenges do you currently face in the management of IT costs?* We wanted to cover a broad spectrum of people and functions in the interviews to get as comprehensive an overview as possible. The interviewed persons (P) have various backgrounds coming from different industries, consultancies, platform vendors or academia. As decisive criterion for the selection of the interviewees, we specified that each of the interviewees must have a relevant responsibility and job description. All interviewees were either already part of the network of the research team or were acquired in the network of *VOICE Bundesverband der IT Anwender e.V.*. The interviews were performed by the first author via Microsoft Teams in German language. Finally, we recorded, transcribed, and anonymized all interviews. Table 1 shows an overview of all interviewees (chronological listing based on the date of the interview).

After the interview phase, we conducted qualitative coding (Corbin & Strauss, 2015) for the data analysis, using the tool MAXQDA, which supports researchers during the qualitative content analysis (Santos et al., 2021). In doing so, we assigned respective codes to the data in several iterations. We applied guidelines for open coding to identify challenges (Corbin & Strauss, 2015). In a selective coding, we assigned the challenges to categories aligned to COBIT components. COBIT as established IT governance framework encompasses seven relevant components to build a governance system and achieve management objectives (ISACA, 2018). Through the alignment of the challenges to the categories, we ensure the link to an existing framework (Saunders, 2019) and the holistic view on the ITCM discipline as part of IT governance (ISACA, 2018). In two further iterations, the research team, consisting of four researchers, reviewed and adjusted the coded challenges and their connection to the categories. We identified 23 challenges referring to the following seven categories: (1) People, Skills, and Competencies, (2) Services, Infrastructure, Applications, (3) Information, (4) Culture, Ethics and Behavior, (5) Organizational Structure, (6) Processes, (7) Principles, Policies and Frameworks.

Table 1. Overview Interviewees

ID	Function	Workplace	ID	Function	Workplace
P1	Director IT Governance Global	Multi Industry, 11.250 employees (EMP)	P9	Sales Manager	ITCM Platform Vendor, 1.000 EMP
P2	Chief Information Officer (CIO)	Electrical Engineering, 400 EMP	P10	Process Owner Global Risk and Compliance	Automotive Sector, 172.500 EMP
P3	Project Manager	IT Consultancy, 50 EMP	P11	Head of Global IT Controlling	Transportation, 30.000 EMP
P4	CIO	Construction Sector, 1.850 EMP	P12	Head of IT Governance	Multi Industry, 4.300 EMP
P5	Head of ITCM	Automotive Sector, 172.500 EMP	P13	Head of IT Governance	Financial Services & Insurance, 350 EMP
P6	TBM Advisor	IT Consultancy, 1.000 EMP	P14	CIO	Fashion Industry, 1.300 EMP
P7	CIO	Financial Services & Insurance, 3.000 EMP	P15	Professor	University of Applied Sciences, Business Information Technology
P8	Head of IT Governance	Automotive Sector, 157.500 EMP			

4. FINDINGS AND DISCUSSION

In the following, we answer our research question: *what are the challenges of IT cost management in the digital age?* To do so, we present the different challenges for the management of IT costs and discuss them in the context of their relevance to the experts and their interrelations.

4.1 Practical Challenges in the Management of IT Costs in the Digital Age

In this subsection, we describe the different challenges for the management of IT costs in detail based on the seven categories introduced above. Table 2 shows an overview of all identified challenges.

Table 2. Overview of challenges in managing IT costs

Category	Challenges
People, Skills, and Competencies	• Enhance Awareness of IT Costs and Cost Drivers (P3, P4, P5, P6, P11, P12, P15) • Establish General IT Know-How (P1, P3, P5, P6, P7, P8, P12, P15) • Improve Management Competencies According to Role of IT (P1, P8, P14)
Services, Infrastructure, Applications	• Realize Adequate Tool Support for ITCM (P2, P3, P5, P6, P9, P10, P11, P14) • Ensure Technical Data Supply for ITCM (P1, P5, P7, P8, P10, P11)
Information	• Specify Clear Objective of ITCM (P1, P3, P5, P11, P15) • Provide a Clear and Consistent Definition of IT Costs (P3, P5, P6, P12, P15) • Ensure Transparency of Consistent IT Cost Information (P1, P2, P3, P5, P6, P7, P9, P10, P12, P13) • Demonstrate Business Impact of IT Costs (P1, P3, P5, P6, P7, P9, P10, P11, P12, P13) • Conduct Stakeholder-Oriented Reporting (P5, P8, P10) • Ensure Comparability of IT Costs Internally and Externally (P1, P4, P5, P12)
Culture, Ethics and Behavior	• Establish a Common Language (P3, P6, P8, P9, P10, P15) • Change Mindset about Value of IT (P1, P5, P6, P7, P8, P9, P10, P11, P12, P15) • Accept IT Department as Equal Partner (P1, P6, P9, P11, P12) • Foster Honest and Transparent Cost Discussion (P1, P5, P8)
Organizational Structure	• Overcome Isolated Units (P3, P5, P6) • Establish Dialogue Structure (P3, P5, P6, P12) • Ensure Formal and Informal Decisions Structures (P1, P5, P6, P8, P9, P10, P15)
Processes	• Execute Processes Efficiently (P1, P3, P5, P8, P10, P11) • Ensure Transparent and Complete Processes for ITCM Execution (P1, P11) • Ensure Process Follow-Up (P5, P6, P11)
Principles, Policies and Frameworks	• Provide a Uniform Data Model (P1, P2, P3, P5, P8, P12) • Enable Policy Enforcement (P1, P5)

IT is a critical success factor for business processes in the digital age and its efficient management becomes a competitive advantage (Urbach et al., 2019). **People, skills and competencies** are "required for good decisions, execution of corrective action and successful completion of all activities" (ISACA, 2018). However, experts identify issues concerning IT know-how and competencies relevant for the efficient management of IT costs. They see a challenge in *enhancing the awareness of IT costs and cost drivers*: especially business employees lack understanding the origin of IT costs and how to link them to the value chain and their consumption behavior (P3, P6, P12, P5). This impedes the ability to use cost as a strategic control variable and for long-term decision-making (P11, P15). The skills "to bring cost information and decisions closer together" (P15) and to use cost driver models for more awareness should be built up to counteract the challenge (P6). Furthermore, experts face a lack of competencies to adapt classical controlling mechanisms on ITCM especially because functioning and complexity of IT relations are not known beyond the IT department (P1, P5, P7, P8, P12). The challenge is to *establish this general IT know-how* to perform target-oriented controlling of IT costs and outline the interrelation between cost and provided service (P3, P6, P15). Furthermore, experts see the challenge to *improve management competencies* even if they are required to efficiently make decisions under cost pressure (P14) and in a long-term perspective (P1). This strategic perspective, however, often cannot be fulfilled as IT personnel lacks management skills (P8) and decision competencies (P1).

Services, infrastructure and applications provide organizations with technology for IT processing and management (ISACA, 2018). The finance discipline makes use of tools and methods of data processing and analysis for improved data quality and decision-making (Rikhardsson & Yigitbasioglu, 2018). The experts agree on challenges concerning the infrastructure, technology and applications (ISACA, 2018) for ITCM related to tool support and technical data supply. First, organizations face the issue to *realize adequate tool support for ITCM*: experts state that they still base their ITCM completely or partly on Microsoft Excel as it is well-known, flexible and no change is needed, however they experience the lack of scalability und integrity (P5, P10, P12). Classical cost management tools miss specificity and therefore cannot support the complexity of IT services (P6, P9). Specific ITCM tools require high effort and cost in customizing to display a company's cost structure (P3) and enable cost recording within the system (P14). Those tools need a consistent and clear data supply in order to support management decisions and foster transparency. However, organizations struggle to *ensure technical data supply for ITCM* by establishing an encompassing master data management as single source of truth (P5, P8). On the contrary, there is inconsistent (P7) and inefficient (P11) data capturing as well as a lack of interfaces for data exchange (P1, P10).

In the digital age, IT is a strategic asset (Urbach et al., 2019). Consequently, the management of IT costs must adopt a strategic character (Urbach & Ahlemann, 2019). A strategic orientation in cost management means using cost information to develop and identify overarching strategies and support decision-making that ensures the long-term perspective of a company (Hansen & Mowen, 2006). According to ISACA (2018) **information** is pervasive throughout any organization. It is required for the effective functioning of the governance system of the enterprise and better cost information allows managers to achieve strategic objectives (Cooper & Kaplan, 1988). However, for ITCM the provision and delivery of information poses major challenges, starting with a clear and company-wide *specification of the objective of ITCM*. "Without target, IT costs can be captured but not managed" (P12). However, experts mention this lack of goal as an inhibitor to execute ITCM (P3, P6) and control the effect of the management discipline (P5, P15). In addition, organizations face a challenge to *provide a clear and consistent definition of IT costs* (P11): "IT costs are those allocated to the IT department, but the fact is that many more are costs for IT and digitalization" (P5). Organizations lack this unambiguous demarcation from other cost types (P1, P15) and thereby lose transparency (P3, P5). The effective management and strategic decision-making (P10) requires cost information. However, interviewees mention a challenge *ensuring transparency of consistent IT cost information*: Data is consolidated and aggregated, losing clarity (P9). As a result, information is not always traceable (P1), and a total cost of ownership analysis is not possible (P6). In addition, personnel costs in IT are not differentiated, which hampers their allocation to individual services (P2, P5, P12). Transparency also lacks for cloud costs, as these occur in both business units and the IT department and are not handled in a uniform manner (P3, P13). This lack of transparent information also hinders organizations to *demonstrate the business impact of IT costs* (P9, P10). Experts state that "it is crucial to understand what we spend money on" (P7) and to directly relate IT costs with content (P1, P5, P12, P13) and strategic topics (P11). However, organizations face an issue to transparently illustrate value (P6), the relation between cost and value (P3, P6) and constructively discuss this business impact through IT investments (P5). ITCM discipline aims to deliver supporting information to enable the responsible persons to make the right decisions. However, interviewees mention the challenge to *conduct*

stakeholder-oriented reporting and deliver the necessary information to them (P5). "The multitude of offered dashboards is error-prone" (P8) and organizations are not able to continuously prove the IT cost for IT services to the stakeholders and thereby offer transparency (P10). Furthermore, interviewees find it also challenging to *ensure comparability of IT costs internally and externally*. Internally, missing harmonization of data hampers comparability (P1) and the relation between cost and impact is not transparent in order to benchmark (P5, P12). On the other hand, external benchmarks require standards for cost types and models that are currently insufficiently developed (P4).

"**Culture, ethics and behavior** of individuals and of the enterprise are often underestimated as factors in the success of management activities" (ISACA, 2018). Culture influences strategic decision-making as well as the collaboration between business and IT (Riedinger et al., 2022). Both are relevant for the efficient management of IT costs (Egle, 2008). However, experts display issues on the behavior of employees concerning IT costs or related to the discussion culture within organizations. Several interviewees mention the lack of a *common language* (P3, P8) that prevents business and IT from establishing a constructive discussion culture and "building a bridge between technological and commercial world" (P9). Instead, they face issues in commonly understanding delivered cost information (P10, P15) and through that taking data-based decisions (P6, P9). Furthermore, IT is often still labeled as cost factor and IT leaders face cost-cutting measures (P1, P5). The challenge is to *change the mindset within organizations about the value of IT* (P5, P11, P12). This mindset change "should move beyond numbers and data" (P6, P9). Currently, the "focus is on money instead of content" (P15) or value add (P7), and interviewees mention a low acceptance of IT costs in business when it comes to chargeback (P1, P8, P10). There is a lack of dialog at "eye level" (P9) which stresses the challenge of *IT departments being seen as equal partner in discussions* (P6, P12). IT is seen as a by-product (P11) and the IT department accordingly does not have the power to make decisions (P1). The behavior of all stakeholders also counts as success factor for management activities (ISACA, 2018). However, experts experience dishonesty and manipulation, especially connected to misallocation of IT costs in chargeback mechanisms (P8) and hidden IT budgets (P5). A challenge therefore is to *encourage honest and transparent IT cost discussion* and thereby overcome disregarded specifications (P1) and the pursuit of non-transparent peer support (P5).

Digitalization drives the demand in IT for more flexibility, faster modifications, and a proximity to the business (Urbach & Ahlemann, 2019). This impacts **organizational structures** as key decision-making entities in organizations (ISACA, 2018). The set-up and execution of the roles and responsibilities for decisions relevant for ITCM pose issues for the interviewees. First, the challenge is to *ensure formal and informal decision structures*. Some organizations lack clear governance and thereby formal decision-making entities (P9), others define organizational structures but do not execute them (P10). They cannot ensure those informal decision structures and "power seems to be in the wrong place" (P15). The responsibility then lies with people who do not have the power of control (P5, P8) or especially business executives do not take accountability for their IT-related decisions afterwards (P6, P9). The conversation about IT costs "is only possible together with IT department and business executives" (P6). The isolated consideration of the IT unit (P5) as well as the separation of IT and finance departments hampers the management of IT costs (P5). A challenge for the experts is to *overcome isolated units* and open up rigid organizational structures for a holistic view (P3, P6). They mention that the decision-making parties act individually, even if "a dialogue only works if we can bring business, IT department and finance together at the same table" (P3). However, experts still see the difficulty in *establishing a functioning dialogue structure* throughout their whole organization (P3, P5, P6).

"**Processes** describe an organized set of practices and activities to achieve certain objectives and produce a set of outputs that support achievement of overall IT-related goals (ISACA, 2018)." If these processes are not defined and harmonized for ITCM (P1) or there is no common process understanding throughout the company (P11), there is a challenge to *ensure transparent and complete processes for ITCM execution*. Furthermore, the *efficient execution of ITCM processes* is an issue: the high number of manual activities are error-prone and slow and require additional effort (P1, P10). Often, this effort is invested into detailed cost allocation and reporting instead of strategic ITCM which hampers an efficient ITCM process (P3, P5, P11). In addition, organizations undertake a detailed planning of targets (P11) and „elaborate business cases that are not tracked" (P5). Therefore, they hamper to *ensure a process follow-up* to close the gap through target performance comparison and by taking measures (P6).

The diffusion of IT and the accelerating adoption of new technologies (IBM Corporation, 2021) lead to a continuously growing IT spend partly managed outside the IT department (Harvey Nash & KPMG, 2020). For a holistic view, organizations need a uniform framework to perform ITCM throughout the whole organization. **"Principles, policies and frameworks** translate desired behavior into practical guidance for day-to-day

management (ISACA, 2018)". However, experts mention the challenge to *provide a uniform costing model* as basis for transparency and comparability (P1): costing models lack a detailed mapping of the company structures (P12) or cost types (P5). Therefore, models only partly reflect total IT costs and services cannot be ordered by users at constant prices (P2, P3, P8). Another challenge is to *enable policy enforcement*. Experts describe a defined central governance which then lacks implementation and enforcement (P1, P5). "Central policies of the IT department are not respected" (P1) such as the deregistration of not needed licenses which lead to increasing IT costs (P5).

4.2 Relevance and Interrelations between ITCM Challenges

In this subsection, we discuss the presented challenges in ITCM in the digital age based on their relevance for the practitioners. Therefore, we compare all categories concerning the number of experts and frequency of mentions. We also include in the heatmap in Figure 1 all challenges on a range from "least mentioned" in white color to "most mentioned" in black color. Furthermore, we examine the interrelations of the challenges.

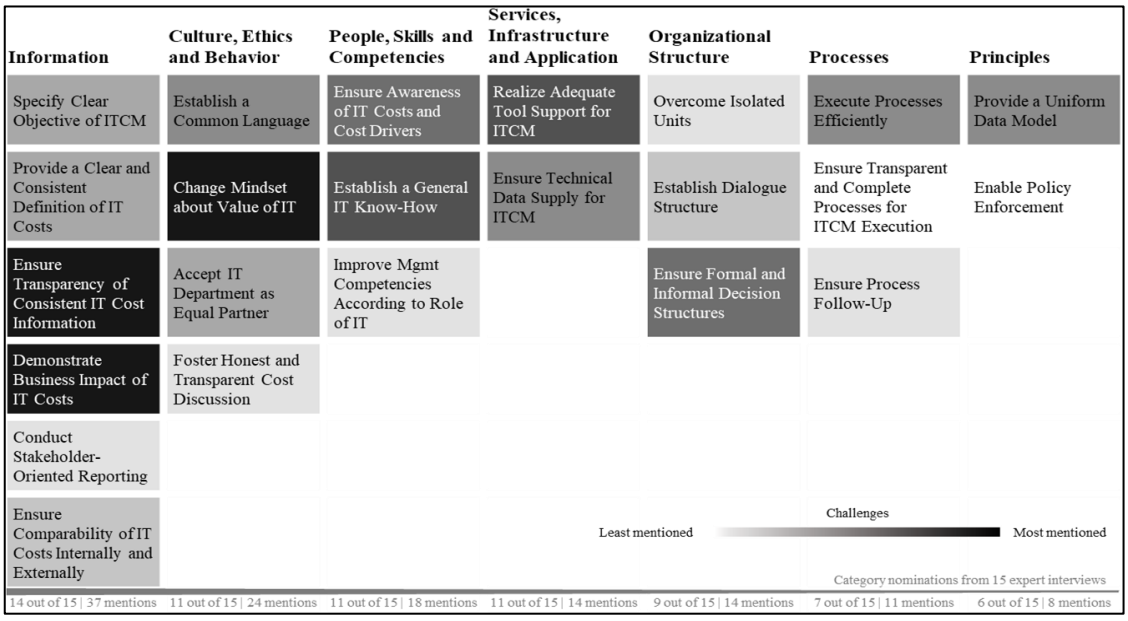

Figure 1. Heatmap of Practitioner Challenges in ITCM

Most practitioners mention challenges concerning **information**. Especially, transparency as well as the presentation of relevant cost information and their impact pose issues for the experts. On the one hand, experts relate those issues in transparent presentation with a lack of tool support or data supply concerning **services, infrastructure, and applications**. On the other hand, most of the experts agrees that the categories **culture, ethics, and behavior** as well as **people, skills, and competencies** have a greater influence on the efficient management of IT costs. As outlined above, the increasing complexity of the IT landscape and greater responsibility in business influence the importance of know-how and cultural change. In addition, required collaboration leads to changes in **organizational structures** and many experts also experience organizational issues for the efficient management of IT costs.

Literature states that the seven used categories do not only individually contribute to a successful management of IT but also interact with each other requiring a holistic perspective (ISACA, 2018). Our results confirm this for a successful management of IT costs. During the interviews, it became clear that the identified issues in ITCM are highly interrelated and overcoming the most mentioned challenges first requires solving other issues. The most mentioned challenges are to *ensure transparency on IT cost information*, *demonstrate the business impact of IT* as well as *change the mindset for the value of IT*. For the *change of the mindset on value of IT*, **organizational structures** need to support collaboration between business and IT (P6) through

formal and informal decision-making (P15) to foster changes in **culture, ethics and behavior**. Furthermore, the mindset change requires a clear understanding and *demonstration of the business value of IT* (P1, P10). However, the findings show that experts often mention difficulties connecting IT costs with content and explaining their direct link to the added value. They require *transparency of IT cost information* on the one hand (P5) and the *awareness of IT cost and cost drivers* on the other hand (P15) to demonstrate the value. Studies outline that the awareness of cost drivers enhances a better understanding of IT cost and business value of IT (Riedinger et al., 2022), however the interviews show that organization still face issues ensuring this awareness. Furthermore, the experts often mention a lack of transparency when it comes to consistent IT cost information. In order to overcome **information** challenges, experts agree on the need of a consistent presentation through an adequate tool (P10), and stakeholders with the competencies to interpret the information to ensure transparency (P7). The experts, however, acknowledge the challenge to *realize adequate tool support for ITCM*. As prerequisite for the appropriate tool the stakeholders need the general IT know-how to make use of the supporting ITCM tool (P5) and to interpret the presented information for decision-making (P6). *Establishing general IT know-how* represents another major challenge for the experts in ITCM. Adequate skill training supports organizations to overcome challenges in both components: **services, infrastructure and applications** as well as **people, skills, and competencies** (ISACA, 2018). The consideration of challenges thus requires focusing on interrelations in a holistic approach.

5. CONCLUSION

Digitalization and increasing IT spend urge ITCM for the effective and efficient management of IT costs. Nevertheless, several challenges arise in the management of IT costs. A deep and holistic overview and discussion of these challenges in the digital age does not yet exist in academia. Therefore, the goal of this publication is the identification and analysis of challenges for practitioners. To reach this goal, we conduct expert interviews and discuss the findings. The mapping to the seven COBIT components ensures a holistic perspective of the 23 challenges. The number of mentions show challenges especially in the categories **information**, **culture, ethics, and behavior** as well as **people, skills, and competencies**. Experts face major issues ensuring transparency on IT cost information, demonstrating the business impact of IT as well as changing the mindset for the value of IT. However, the categories and underlying challenges are interrelated and overcoming the challenges requires a holistic approach involving these interactions.

This paper makes a theoretical contribution by providing a deep and holistic view on current management challenges of IT costs from an expert perspective, and thus by identifying potential future research directions. Moreover, practice gains insight into challenges during ITCM in the digital age from several practitioners' perspectives and the interrelation between those challenges.

However, the study itself has limitations. First, we only interviewed 15 German-speaking experts. We mitigated these limitations by including experts with diverse backgrounds and from different industries and company sizes. Although we cover as broad a spectrum as possible with these experts, further interviews with experts in various roles around the world could enrich the current research findings, add even more validity, and provide the basis for a holistic analysis of different stakeholder group perspectives or differentiated view on organization sizes or industries. Second, we focus on the expert perspective to identify the challenges in the management of IT costs. A comparison of these challenges with the literature enables a broader insight and the identification of integration deficits between theory and practice. In summary, future research should now seek to analyze ITCM research to enhance or develop solutions to overcome the identified challenges.

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