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An Assessment of Digitalization Impact

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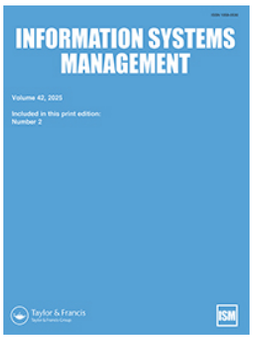

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From Elusive to Opaque Boundaries of the F&A Function: An Assessment of Digitalization Impact

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ABSTRACT

Previous research on digital transformation of Finance & Accounting is largely conceptual, lacking insights into financial specialists' roles in adopting and implementing digital technologies. By employing Resource Orchestration Theory, this study examines digitalization's impact on F&A functions through four case studies. Findings reveal diverse adoption strategies, evolving F&A processes, and data-driven decision-making. The results show that due to the adoption of digital technologies, the elusive boundaries of F&A functions have become opaque. This paper contributes to F&A functions literature and provides new knowledge on how to seize the opportunity arising from the more elusive boundaries of F&A within diverse organizations.

KEYWORDS

Finance and accounting; digital transformation; digital technologies; decision-making

Introduction

Digitalization has captivated the attention of Finance and Accounting (F&A) functions (Firk et al., 2024) as both endogenous and exogenous developments affect specialists in their work (Bhimani & Willcocks, 2014). As an example, firms need to comply with EU driven standards (e.g. Corporate Sustainability Reporting Directive – CSRD), in which the F&A function needs to report corresponding goals. F&A functions use computerized Information Systems (IS) to collect, store and analyze information (Porter & Heppelmann, 2014) and report on (non)financial information (Atkins, 2020). Consequently, the F&A function is part of a continuous digital transformation (Lindvall & Iveroth, 2011), in which digital technologies provide both challenges and possibilities that influence specialists' future skills (Bhimani & Willcocks, 2014).

Although a uniform understanding of the term digitalization is lacking (Knudsen, 2020), literature provide various views, including the "interpretation and management of the world through processes" (Clarke, 2019, p. 59), "emergence of technological platforms of information and communications technology" (Corrocher & Ordanini, 2002, p. 9), and "manifold sociotechnical phenomena and processes of adopting and using these technologies in broader contexts" (Legner et al., 2017, p. 301). As we address the importance of F&A skills and the role of digital technologies specifically, we build on the definition of El Sawy et al. (2020), who defines digitalization as "the process of transforming the structure, processes, people skills and culture of the entire organization, so it can use digital technologies to create and offer products, services and experiences that customers, employees and partners find valuable" (p. 142).

Jackson et al. (2022) studied the impact of digital technologies on the desired skills of F&A specialists and found that "the implementation of digital technologies has led to F&A roles shifting from transaction focused tasks to using data generated by technology to inform stakeholder strategies, resulting in changing skill requirements (p. 548)." This finding corresponds to IS. The implementation of IS, however, is a complex organizational business undertaking as it affects financial business processes as well as technology integration and consequently involve both F&A and IT departments (Epizitone & Olugbara, 2019; Jagoda & Samaranayake, 2017). Literature describes this type of IS as "heavyweight IT" (Bygstad, 2015) as they constitute a barrier to organizational change (Bouwman et al., 2011). Today, firms focus on supporting work processes by means of digital technologies, such as robotic process automation (RPA), process mining, machine learning (ML), and artificial intelligence (AI), that contribute to business innovations (Rahman & Ziru, 2022). In contrast to IS that focus on technology and platforms, digital technologies are termed as "lightweight IT" as

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they focus on the support of end users in their daily work (Bygstad, 2015).

In this paper, we focus on the role of digital technologies (lightweight IT) and how they influence the work of F&A specialists and affect decision-making. Bygstad (2015) demonstrates that the lightweight nature of digital technologies enables a more organic implementation. Kilfoyle et al. (2013) argues that this "kind of implementation process is rather informal, akin to vernacular accounting systems: systems that are "self-generated by managers and/or specialists and not officially sanctioned in the organizational hierarchy" (p. 382). The discussion on digital transformation of the F&A function is mainly conceptual (Knudsen, 2020), while exceptions have focused on empirically investigating the technology prerequisites for the digital transformation of the F&A function (Firk et al., 2024). Knudsen (2020) argues that "F&A specialists can seize the opportunity arising from the more elusive boundaries of accounting to become key constituents in their organizations" (p. 15). The author underpins the call for more research to empirically investigate how F&A specialists operate in the adoption and implementation processes of digital technologies (p.15). The aim of this paper is to highlight how F&A's digital initiatives, such as data-driven decision-making and process automation, set a foundation for wider digital transformation across the organization, aligning F&A with overall business strategy and innovation. Given the importance of digital technologies, our assumption is that F&A specialists may play an essential role in shaping the elusive boundaries of the F&A function. To address this gap, the focus of this research is on the role of F&A specialists, who are faced with opportunities to use digital technologies. Therefore, the leading research question in this paper is:

RQ 1: *How do F&A specialists adopt and implement digital technologies to transform financial processes and enhance decision-making in their organizations?*

To attain these research objectives, we conducted four in-depth exploratory case studies. These empirical case studies were carefully analyzed to evaluate the extent to which F&A specialists are able to adopt and implement digital technologies. The findings of this research contribute to the F&A and digitalization literature. We provide evidence that digital technologies cause a shift from elusive to opaque boundaries. We applied the Resource Orchestration

Theory (ROT) that posits that managers must orchestrate firm's resources by structuring, bundling, and leveraging resources such as F&A services (Sirmon et al., 2007, 2011). ROT is useful to address the complexities of orchestrating F&A services in the context of adopting and implementing digital technologies. This paper is organized as follows. First, we address the theoretical background and next, we present the research method in Research methodology and findings are described in Findings. Subsequently, discussions and conclusions are presented in Discussion and Conclusion, respectively.

Literature background

This section introduces the relevant literature for developing empirical research, presenting an overview of the Resource Orchestration Theory, and method to identify factors that influence adoption and implementation processes. Lakshmi et al. (2020) found that in F&A functions technology is largely considered as a game changer and such organizations are increasingly adopting digital technologies in their processes to engage efficiently and accomplish higher-value objectives.

Resource orchestration theory

ROT focuses on the integration of asset orchestration and resource management (Sirmon et al., 2007, 2011) and argue that "managers need to orchestrate their resources to realize any potential advantage" (Chirico et al., 2011, p. 310). Literature shows that the role of managers is underdeveloped in terms of initiating resource-related processes and actions to initiate oversight (Kraaijenbrink et al., 2010). For example, a study of Crook et al. (2008) identified unspecified contingences related to managers' "strategic choices." Literature shows that after resources have been acquired, managers must effectively structure, bundle, mobilize, and deploy resources to create value (Chadwick et al., 2015). Consequently, firms rely on managers' skills in generating synergetic effects by deploying resources (Sirmon et al., 2007). In this research, we emphasize on the integration of resources to support the adoption and implementation of digital technologies (Sirmon et al., 2011, p. 1392). The bundling arguments could be further developed by theorizing that the adoption and implementation of digital technologies is affected by various factors, which, in turn, need to be orchestrated carefully (Patil & Wongsurawat, 2015).

This research proposes that F&A managers, following ROT, orchestrate resources by structuring, bundling, and leveraging digital technologies and human expertise can drive F&A digital transformation. Thus, we introduce the following proposition:

F&A functions that effectively bundle internal digital teams with IT departments will achieve higher efficiency in decision-making and process automation.

Factors that influence adoption and implementation processes

A systematic literature review was performed that include three databases: Web of Science, Scopus, and Google Scholar to identify factors that correspond to the adoption and implementation processes of digital technologies by F&A specialists, and publications in the period 2000 to 2023. Search terms used include "centralized finance and accounting function," "F&A specialists and digital technologies," "organization," "adoption," "implementation," "determinants," and "factors." The selection was based on two main criteria. First, publications that include at least one search term in the title, abstract or keywords were selected. Second, only peer-reviewed journals, book chapters and conference proceedings with more than 50 citations were selected to ensure the reliability of the data collection. Based on the analysis of selected papers, the following five overarching factors in the context of adoption and implementation processes of digital technologies were identified: F&A processes, digital technologies, decision-making, customer-orientation, and digitalization impact on F&A functions.

F&A processes

To support the adoption and implementation of digital technologies, firms are modularizing F&A processes (McLoughlin et al., 2021). Sanchez and Mahoney (1996) define modularity as "a special form of design that intentionally creates a high degree of independence or 'loose coupling' between component designs by standardizing component interface specifications" (p. 65). Reijers (2021) argues that applying a modular approach to design business processes results in sub-processes that contribute to service flexibility. Hence, modularization requires the dynamic coordination of business processes as opposed to procedures developed from a specified static sequence, in which the preceding process must be completed before beginning the next. From an ROT view, a firm's management aims to synchronize the tasks of IT specialists via dynamic orchestration of their F&A processes.

Digital technologies

During the last decade, we witnessed a tremendous interest in the automation of accounting services through what has been coined as digital technologies. Recent examples include Robotic Process Automation (RPA), Machine Learning (ML), Artificial Intelligence (AI), Process Mining (PM) and Task Mining to name a few (Lacity & Willcocks, 2021). As literature lacks a clear definition of digital technologies, we build on the work of Gong and Ribiere (2021) by arguing that "the use of emergent digital technologies are applied to replace human capabilities, particularly those involving cognition such as learning and problem solving, for the execution of work tasks that were previously carried out by a human." Digital technologies may address the need for fostering collaborations and knowledge exchange in the organizational environment that may re-configure the role of F&A professionals (Mancini et al., 2021; Perdana et al., 2023). According to Agostino et al. (2022) digitalization is redefining accountability relationships which result in blurred accounting boundaries.

Decision-making

Governance is associated with a firm's responsibility to manage business services. Franke and Hiebl (2023) underpin the importance of governance as the quality of (big) data sources is associated with higher perceived levels of decision quality. We define governance, and more specifically decision rights, as "a firm's overarching capacity and responsibility for directing and monitoring organizational responsibilities to manage business services activities as well as its operations" (Westphal & Sohal, 2013). Zhao et al. (2021) analyzed how different resource allocations impacts the development of strategic relationships, such as the relationship between an F&A and IT department. The authors find that decision rights are perceived as a dynamic process rather than unchanging decision results that influence various resource allocations. According to the ROT, managers need to manage the decision rights of F&A and IT resources regularly as information-intensive processes have become more dispersed.

Customer-orientation

Firms must improve their F&A services on a regular basis and strengthen their resources to deliver higher value. This requirement refers to the factor customer-orientation, which is defined as a "means of demonstrating the business rationale of producing value for customers that meets the needs of their target groups" (Osterwalder et al., 2005). Customer-orientation implies that F&A services fit with internal customers' needs. According to ROT, firms' managers must evaluate internal and external customers' needs frequently and adapt the deployment of F&A resources when needed. Managers may orchestrate F&A services by means of internal distribution channels to exchange value (Sjödin

et al., 2022). This includes the identification of *relationship expectations that may influence the provision of F&A services. We may conclude that* managers safeguard the quality of F&A services by applying a customer-orientation view.

Digitalization impact on F&A functions

A study of Bhimani (2020) shows that digitalization within firms results in large quantities of data, which are growing continuously. Various academics recognized the possibilities of F&A investigation where datafication prevails or is growing (Moll & Yigitbasioglu, 2019; Raffoni et al., 2018). The rapid pace of digitalization and use of data in F&A functions will impact on the role and tasks of F&A experts, for instance by implementing automated controls. Consequently, this may lead to ethical and legal concerns around the analysis of how decisions are made. An actual business challenge is how to manage compliance regulations in case AI solutions have been implemented (Dwivedi et al., 2021). This may result in compliance issues. By applying an ROT lens firms may develop strategies to bundle F&A and IT resources and as such overcome compliance challenges.

In summary, this paper focuses on how F&A functions use digital technologies to enhance financial processes and could expand on how these efforts contribute to broader organizational digital transformation. F&A plays an important role by providing critical financial insights, optimizing operational efficiency, and collaborating with IT departments, thereby influencing cross-departmental digital adoption.

Research methodology

Due to the complex nature of the adoption and implementation of digital technologies, we decided to adopt an exploratory, case study-based approach. Our basic assumption is that this provides us a deeper understanding of the subject under examination (Yin, 2018). Case study research is a common method in the field of IS (Orlikowski & Iacono, 2001) and useful when it comes to answering "how" and "why" questions (Benbasat et al., 1987). Through an extensive research protocol protecting the interests of the participating firms, we were able to interview various firm representatives. To select relevant case study organizations, we used two main criteria. First, in the context of F&A, firms increasingly use digital technologies solutions to automate "the last mile." As such, we may assume that they created insights in the use of digital technologies and its effect on the factors in scope. Second, we address the need to select firms that are acting in multiple industries. This enables us to identify similarities and distinctions as part of a cross-case analysis. In short, we consider including in total four case studies.

Case study introduction

The presented four cases exemplify the resilience of diverse industries in their digital transformation journey and in the face of unprecedented challenges. For example, in Europe, a logistic service provider (Case 1) swiftly embraced digital solutions during the COVID-19 pandemic. A global employment agency (Case 2) navigated the evolving landscape by emphasizing rapid response times and adaptability. Simultaneously, a longstanding construction and development organization (Case 3) focused on creating sustainable living environments. Lastly, a global financial services provider (Case 4) strategically integrated technology, acquiring a banking license to deepen their understanding of financial services.

Data collection

To avoid "elite bias," we interviewed multiple F&A management and employee representatives. This is relevant because respondents express their personal opinion about how they perceive situations such as the implementation of digital technologies. Hence, we may assume that their opinions are at least partially subjective. To select participants, we have used two criteria. First, interviewees were selected from a strategic level as they are able to create oversight and as such look at their F&A function as a whole and identify relationships with business units and IT department.

Secondly, at operational level F&A, specialists were selected as they are involved in the adoption and implementation of digital technologies. In-depth interviews were conducted with 16 participants who were all directly involved in the topics under study (see Table 1). This was to ensure internal consistency within each firm. The interviewed respondents have a minimum of 5 years of experience regarding F&A services and digital technology solutions (functionally or technically). We apply a cross-section within the firms that yield to establish a holistic view. Due to confidentiality requirements of the firms, we cannot disclose the details (names) of firms and their representatives. Interviewees were all located in the Netherlands and India. All the respondents were interviewed in the period May 2022 and June 2023. Interviews varied from 50 min to 90 min in length and they were conducted via a semi-structured design with many open-ended questions. All interviews were

Table 1. List of experts interviewed from case study organizations.

Case study	Number	Role	Date	Duration
Logistic Service Provider	1	Manager FSSC	20052022	60 min
	2	Manager Process & Change management	10062022	60 min
	3	Senior RPA developer	10062022	90 min
	4	Data specialist	10062022	90 min
	5	CFO BU Customer Excellence & Digital	15062022	60 min
	6	Manager Accounts Payable FSSC	15062022	60 min
Employment Agency	7	Principal Staff Manager Business Services	10062022	60 min
	8	IT Director	10062022	60 min
	9	Director Business Unit Inhouse	20062022	60 min
	10	Product Owner Process & RPA	10072022	60 min
Construction and Building Company	11	Director FSSC	15072022	60 min
	12	Manager Business Consultancy	15072022	60 min
Financial Services Provider	13	Senior Vice President Europe	29062023	60 min
	14	Director Financial services	22022023	50 min
	15	Delivery Manager	10052023	60 min
	16	Digital Solution Architect	22052023	60 min

recorded and transcribed, and next confirmed by the respondents for approval to ensure accuracy and reliability. The text of each case study as a whole was also reviewed by the firms' senior management to avoid uncertainties. Next, the case study outcomes were confirmed by senior management. As suggested by Yin (1994), we developed a case study protocol that consists of (a) an interview protocol (see Appendix A), (b) information of the focal firms, and (c) a case database.

Data analysis

We analyzed the data in a number of systematic steps in order to ensure that the process was consistent and replicable. First, we studied context-related information from a broader organizational F&A and IT relationship. The aim was to create a basic understanding of what type of digital technologies were implemented. Second, we conducted a thorough analysis of interview transcripts and archival data, verifying the data as needed via follow-up telephone calls and e-mails. By triangulating the interview transcripts with supplementary key documents (e.g. webinar input, whitepapers, factsheets, field notes), we were also able to triangulate sources (Denzin, 2012). This allowed us to validate the steps included in the research process and improve the internal validity of the expert interviews. All interview data were subject to cross-examination by two researchers, and any errors were corrected, resulting in additional triangulation of the available data.

We used coding and clustering techniques (Yin, 2017) and followed the advice of Miles and Huberman to divide coding among two researchers (Miles & Huberman, 1994, p. 64). More specifically, Atlas.ti v. 24 was used to code and combine interview data of the 16 respondents into concept maps which resulted in a total of 141 codes. We conducted four rounds of concept aggregation. As suggested by Langley (1999), we applied a temporal bracketing strategy to organize the data in the first round. This round resulted in a set of constructs, categories, and codes (see Table 2). During the first three rounds, a number of concepts that were closely aligned to each other were aggregated into a single code. For example, the code "key performance indicators" was closely aligned to the code "performance indicators." Moreover, we reduced the number of codes by ignoring concepts that are perceived as influencing attributes. In round four, we identified 32 codes (concepts) that represent the most important elements of our research framework. Next, we discussed the findings and clarified any disagreements. Following the coding process, we created insight into relevant concepts and mutual relationships, and labeled the relationships "Is part of," and "Is associated with" (see Appendix B).

Findings

In the pursuit of standardizing and enhancing their F&A processes, the interviewed firms showcased innovative strategies driven by digitalization. In the following subsections, we present the findings in relation to F&A processes, digital technologies, decision-making, consumer-orientation, and impact of digitalization on F&A specialists.

F&A processes

Case 1 exemplified a shift from manual data entry to exceptions handling, achieved through the implementation of RPA bots and ML for invoice tasks. Their approach not only decreased complexity in end-to-end F&A processes, but also increased the value of their F&A

Table 2. Interview coding and sub-codes.

Constructs	Codes	Sub-codes	Indicated by interviewee
F&A processes	Business processes	Standardization, Harmonization, Integration of subprocesses, E2E processes	1, 2, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16
	Monitoring	Business consultants	2, 5, 7, 10, 12, 14
	Outcomes	Increase of efficiency, decrease process lead times, Faster process lead times, Low error rate	2, 6, 9, 11
	Purchase order	Receipt, Invoice detection, Invoice handling	3, 4, 6, 11
	Client satisfaction	Client experience, Chatbots	1, 2, 5, 6, 12
	KPI	Absence KPIs, Targets	6, 11, 12, 13
	Collaboration	IT team, IT architect	1, 3, 4, 5, 7, 8, 16
	F&A center	Site manager, Service provider, Administration, Operations department, Business unit	2, 6, 8, 9, 11, 12
Digital technologies	Process automation	RPA, Process mining, Task mining	1, 2, 3, 4, 7, 8, 9, 10, 11, 13, 15, 16
	Intelligent automation	AI, ML, ChatGPT, Google AI, Configurable systems	1, 2, 3, 7, 8, 9, 10, 11, 13, 15, 16
	Digital format	PDF, XML, Dashboards	2, 3, 4, 8, 9, 11, 15
	Minimum Viable Product (MVP)	IT director, Architecture, Pilot, Testing, Change board, Improvement project	2, 3, 9, 10, 11, 15
	Data	Single source of truth, ERP, Data strategy, Data taxonomy, Data accuracy, Unstructured data	2, 3, 4, 6, 8, 9, 10, 13, 16
	Data science	Events	1, 3, 4, 8, 15, 16
	Digital issues	Exception handling, Fragmented solutions	3, 4, 6, 16
Decision-making	Complaints	Frustration	7, 11
	Fraud detection	Ghost invoices, Client reliability, KYC, Compliance	2, 6, 8, 9, 13, 14, 15
	Budget	Investments	1, 6, 11, 13, 15
	Automated governance	Predictive decisions, Data governance, Governance rules, Automated calculations	2, 3, 4, 7, 10, 14, 16
	Organizational structure	Dedicated team	1, 7, 9, 12, 15
Consumer-orientation	Business cooperation	Business departments	3, 4, 5, 6, 8, 9, 11, 12, 13, 16
	Internal ecosystem	Dedicated F&A team, Internal ecosystem	1, 5, 8, 9, 14, 15, 16
	Monetization	New services	13, 15
	Analysis client requests	Proactive analysis	7, 11, 14
Impact of digitalization on F&A specialists	Knowledge and skills	Task automation, Change, Adoption, Digital skills, Super user, Reskilling	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 15, 16
	Jobs	Fear of losing jobs, Job satisfaction, Routine work	1, 2, 6, 9, 12
	Barriers	Elderly employees, Employee resistance, Customization, Threat	1, 2, 3, 4, 7, 9, 10,11, 12
	Culture	Mindset	1, 5, 7, 10
	Employee satisfaction	Change program, Ambassadors, Retention, Human value, Townhall meetings, Digital open-door policy, Incentives	1, 2, 6, 7, 9, 13, 15, 16
	Training	Education, Knowledge sharing	1, 3, 4, 6, 11, 16
	Roadmap	Planning, Professionalization, Incremental change	3, 4, 8, 14
	Work/Life balance	Disturbance	1, 9, 11, 13, 16

function through improved understanding and analysis of these processes. Employee involvement and proactive information sharing played crucial roles, leading to higher satisfaction scores and openness toward digital initiatives.

Case 2 prioritized standardization and uniformity in their digitalized F&A processes, focusing on core functions like hiring, development, and onboarding. They employed RPA solutions to automate financial process-related tasks, ensuring a seamless and error-free process. The emphasis was on coordination, ensuring coherence in interdependent sub-processes, and managing complexities in large end-to-end processes. Challenges in process mining tools were addressed through innovative solutions, highlighting their adaptability and commitment to efficiency.

Case 3 strategically implemented digital technologies, aiming to streamline processes, enhance collaboration, and improve risk management. The application of digital tools such as RPA promised significant reductions in process duration, enabling operations teams to focus on control points and customer satisfaction. Their modularized F&A processes formed the foundation for digitalization efforts, allowing for customization based on varying customer ERP landscapes. Notably, a deep dive into business process logic facilitated continuous streamlining and optimization.

Case 4 emphasized modularization as a prerequisite for digitalizing F&A services. Their strategies ranged from extending existing ERP systems with digital technologies to building entirely new ERP environments. These approaches significantly reduced lead times, enabling rapid approvals and efficient onboarding processes. Continuous monitoring and identification of

process improvements became the norm, underscoring their commitment to digital innovation.

In essence, these firms leveraged modularization, digital technologies, and a focus on customer satisfaction to streamline processes, minimize errors, and adapt to evolving market demands. Collaborative efforts, data-driven decision-making, and the integration of innovative tools were pivotal in their digital transformation journeys.

Digital technologies

In the realm of digital technologies, diverse approaches emerge, tailored to the specific needs of various sectors. Our analysis revealed that **case 1** adopts a digital and data-driven strategy, emphasizing F&A process optimization and customer value. Based on E2E processes, resources are deployed in two core entities: (1) a digital team as part of the F&A function that build and maintain solutions like RPA, machine learning and process mining/task mining, and (2) the IT department that is responsible for running and maintaining (cloud) platform services. Due to this distinction, each entity is able to apply their specific skills and expertise.

> We intensively collaborate; for example, with the consultants of the regular IT teams to inform them about changes that may occur when new releases of Salesforce or SAP are implemented. The F&A function digital team is involved in release test activities to ensure a sound performance, and we are jointly involved in quarterly Product Increment (PI) events to develop new digital solutions. (Source: Expert 6)

Case 2 digital transformation journey focuses on architectural design, digital dashboards, and a modular approach. The IT landscape is divided into two domains: (a) front-office solutions to support F&A services that are predominantly supported by the IT department and (b) digital technologies that are supported by the F&A function, such as RPA, ML, and AI solutions to streamline F&A processes. Currently, the F&A function is exploring ethical AI applications while planning hyper-automation integration to support F&A processes. Emphasizing F&A data exchange through API configurations, they create an integrated digital platform.

> We are in the middle of a digital transformation journey. From an external view the impact of corporate social responsibility and ESG affects our business as we have to adjust financial processes and show evidence that we are transparent regarding labor conditions. Changing client demands shows that we have to provide information of the educational level of recruited staff automatically by using portals. So, the digital transformation journey aims to provide frictionless business services to internal and external users. (Source: Expert 8)

Case 3 has organized the digitalization and innovation into two departments. IT platforms (ERP, building information systems, cloud services) are managed by the firm's IT department. In contrast, digital technologies are organized by the F&A function by means of a dedicated digital team. The F&A function digital team is piloting 4D and 5D software, emphasizing progress monitoring via data dashboards. This enabled them to control the time-to-cost dimension and identify how progress monitoring added value to their project reporting, which corresponds to F&A processes as well. The digital team supports RPA solutions that are used to automate financial routine decisions such as invoice processing and contract management tasks. This could help to reduce the workload of administrative staff and free up their time for more strategic tasks.

> I think the automated decisions of financial processes will lead to improved efficiency; I mean efficiency is the keyword." Another mentioned that "You reach maybe more controls compliance type of topics. It will help to face out certain steps, eliminate human steps. So, in that sense, it can definitely improve controls, I am sure. (Source: Expert 12)

Case 4 explores emerging technologies, experimenting with blockchain and metaverse applications. Agile working methods facilitate rapid F&A integration, with a focus on customer benefits. API layers interconnect digital technologies, ensuring smooth data exchange.

> We use emerging digital technologies and API layers for data exchange. Our goal is to provide innovative financial services and enhance customer experience. (Source: Expert 16)

The analysis of the four cases reveals several key patterns in their approaches to digital transformation. Automation is a common focus, with all cases implementing technologies like RPA and AI to streamline F&A processes and reduce manual tasks, though Case 2 goes further by exploring ethical AI. Each case shows a division of responsibilities between IT and F&A digital teams, but the level of integration varies. Case 1, have close collaboration, while others, like Case 3, maintain more distinct roles. Customer relations is another theme, particularly emphasized in Case 1 and Case 4, where digital solutions aim to enhance customer value and experience, contrasting with Case 3's focus on operational efficiency. The cases also reflect different levels of digital maturity,

with Case 4 exploring cutting-edge technologies like blockchain and metaverse. Others focus on more established tools like dashboards and automation. Overall, the themes of automation, customer-centric innovation, and collaboration between IT and F&A functions highlight diverse strategies, but a shared goal of improving efficiency.

Decision-making

Managing decision rights in the digital landscape involve intricate considerations, particularly in the context of F&A services. Digital technologies have streamlined routine-based decisions, enhancing efficiency. However, challenges arise in automating ad-hoc or multifaceted decisions, where human judgment remains pivotal. Digital decision rights are automated, yet complexities emerge in tasks requiring cross-source validation.

> The code review is very important. . .to automate the separation of duties as we have to meet quality and compliance standards. (Source: Expert 3)

In case 2, decision rights are automated for routine tasks, ensuring swift, error-free operations. However, dynamic scenarios pose challenges, lacking automated solutions.

> You reach maybe more controls compliance type of topics. It will help to face out certain steps, eliminate human steps. So, in that sense, it can improve controls. (Source: Expert 7)

Case 3 explores automation's potential in project management, quality control, and customer experience enhancement. While automation enhances balancing risks and benefits, the firm focuses on achieving efficiency opportunities by automating routine-based decision-making.

> "I think the automated decisions of financial processes will lead to improved efficiency; I mean efficiency is the keyword." (Source: Expert 9)

In **case 4**, digital decision-making aids routine F&A services, employing configurable systems for simplified decisions. However, complex financial decisions still rely on human judgment.

> Taking financial-related decisions by means of fully automated digitalized decision-making may result in financial risks and compliance issues. (Source: Expert 16)

These cases highlight the balance in managing decision rights, showcasing the intersection of automation's potential and the necessity of human expertise. They also show the different impact of digital technologies on decision-making in F&A services. Automation, particularly through RPA, ML, and AI, has streamlined routine decisions across all cases, improving efficiency and control. However, challenges persist with more complex, ad-hoc decisions that require human judgment, especially in tasks needing cross-source validation, as noted in Case 1. Case 2 automates routine tasks effectively but struggles with dynamic scenarios that lack automated solutions. Similarly, Case 3 emphasizes efficiency in project management and quality control through automated decision-making. Case 4 uses configurable systems for simplified decisions but still relies on human intervention for more intricate financial decisions due to concerns about financial risks and compliance. Overall, automation improves efficiency in routine tasks, but human judgment remains crucial for handling complex, nuanced decisions across the board.

Customer-orientation

In all four cases, a customer-oriented approach was central to the digitalization strategies of the firms. In case 1, the efforts were made to develop seamless services by exploring digital ML features to simplify F&A processes like Purchase2Pay. The F&A function actively sought ideas from internal departments and conducted practical pilots to improve financial services through digitalization. However, a strong emphasis was placed on rigorous evaluation, particularly in cases involving costly solutions like process mining tools, ensuring the investment aligns with tangible benefits. **Case 2** showcased continuous alignment between F&A function specialists and business representatives to meet evolving business needs. Various proofs of concepts were initiated, employing technologies like RPA and Artificial Intelligence (AI) for predictive analysis. The F&A function expertise in digital solutions facilitated this collaboration, fostering a high degree of trust.

In **Case 3**, a customer-oriented approach was evident in the demand management strategy. The F&A function focused on meeting service levels, emphasizing quality and quantity, as demanded by both internal and external customers. The implementation of intelligent automation aimed to enhance employee satisfaction, reducing frustrations associated with manual tasks and ensuring job contentment. For **Case 4**, a proactive customer-orientation was evident through their contact center, which actively analyzed customer requests and provided proactive feedback. By collecting and discussing relevant data, the F&A function ensured that financial services were tailored to meet customer needs effectively. Digital technologies were harnessed to

explore opportunities, emphasizing the importance of coherent data relationships in identifying avenues for improving F&A services.

Across these cases, the F&A functions exhibited a clear commitment to customer satisfaction, and leveraging digital technologies not only to facilitate operations but also to proactively engage with customers, understand their needs, and enhance the quality of financial services provided. In Case 1, the F&A function jointly discussed opportunities with business departments to simplify financial processes and conducted pilots to verify results. Case 2 demonstrated continuous collaboration between F&A specialists and business representatives, leveraging RPA and AI for predictive analysis to meet evolving business needs. In Case 3, customer-orientation was reflected in the demand management strategy, where AI improved both service levels and employee satisfaction Case 4 emphasized proactive customer feedback through their contact center, using data analytics to tailor financial services to customer needs and explore opportunities for improvement. Overall, all cases demonstrate a commitment to enhancing customer satisfaction through digital technologies.

Impact of digitalization on F&A specialists

Digitalization has transformed the landscape of F&A functions under study. In case 1, the F&A function aimed to be a digital native entity, prioritizing a "*Digital First*" approach. The emphasis was on centralization, elimination of redundancies, and standardization through automation, cloud adoption, and data-driven solutions.

> Our main strategy is based on five pillars: 'Digital First,' becoming a digital native, intensifying collaboration with business departments, enhancing employee agility, and centralizing financial activities. (Source: Expert 1)

Challenges were identified in adapting to changing laws, cybersecurity, and online fraud, demanding strategic planning for sustainable operations.

> Changing laws and legislation, such as International Financial Reporting Standards (IFRS), may impact our F&A processes and reporting. We have to develop strategies to overcome potential challenges. (Source: Expert 2)

In **Case 2**, the F&A function initially faced resistance from specialists concerned about job displacement due to automation. However, as market dynamics and internal pressures intensified, digital solutions were embraced. The F&A function utilized technologies like RPA and AI to streamline operations.

> The rise of digital solutions posed challenges. Specialists only face the output of automated transactions that refer to exceptions, which affects their job satisfaction. This requires attention from an enterprise cultural perspective. (Source: Expert 9)

Challenges arose in managing the retention of specialists, balancing standardized tasks with exceptions, and ensuring job satisfaction in an environment where digital solutions focused on errors, impacting morale. The F&A function's approach involved careful digital education, emphasizing process knowledge, and addressing specific pain points.

> Our aim is to achieve a higher degree of bonding with temporary workers. As we are closely aligned with primary business services, we must develop strategies and create business-driven insights (Source: Expert 7).

In **Case 3**, digitalization led to fundamental changes in job roles, necessitating adaptability and continuous learning. While digital technologies streamlined processes and improved efficiency, challenges surfaced in areas such as onboarding, invoice processing, and maintaining work–life balance. The company focused on clear processes and uniform inputs to harness the potential of digital tools.

> Digital technologies are tools to align processes. When working with digital tools, F&A specialists noticed that clear and uniform inputs are necessary. It helps to get processes organized in a better way (Source: Expert 1).

Specialists underwent training to handle emerging technologies, fostering an environment where upskilling was seen as a shared responsibility between F&A function management and their specialists. Management emphasized intrinsic motivation, recognition, and personal growth of specialists to mitigate attrition risks.

> We must ensure that onboarding is smooth. If the business unit lacks onboarding capabilities, new F&A specialists can feel lost and unproductive for one or two months. (Source: Expert 12)

Case 4 recognized the need for a skilled F&A workforce to navigate the rapidly evolving digital landscape. They invested heavily in internal capability and competency units, fostering a culture of continuous learning.

> Change is constant! If you do not have the skills, you are out. Technology changes so rapidly and becomes so complex that even skilled colleagues are severely challenged. (Source: Expert 15)

By dedicating a portion of F&A specialists' time to training, offering incentives, and encouraging exploration of digital focus areas, F&A management ensured specialists remained motivated and up to date with the latest technologies.

> Attention to education and training mitigates the risk of attrition. F&A specialists who are motivated intrinsically perform better in practice. (Source: Expert 14)

Similar to Bhimani and Willcocks (2014), and Fernandez and Aman (2021), the overarching findings of the case study analyses show that the digitalization of F&A functions has significantly transformed the role of F&A specialists. For example, Case 1 adopted a Digital First approach, in which F&A specialists collaborated with business departments and as such became more agile to cater for changing circumstances. Case 2 initially faced resistance from specialists concerned about job displacement due to automation but later embraced digital solutions like RPA and AI (Sathya et al., 2023). The challenge shifted toward focusing on centralization, eliminating redundancies, and standardizing processes through automation and cloud-based solutions, aging job satisfaction and specialist retention as digital tools primarily handled exceptions. In Case 3, digitalization reshaped job roles, emphasizing the need for adaptability and continuous learning (Galanti et al., 2023). In addition, upskilling was prioritized to embrace the potential of digital technologies, with management focusing on fostering motivation and reducing attrition risks. Similar to Ciarli et al. (2021), Case 4 recognized the importance of a skilled workforce in navigating the rapid evolution of digital technologies, investing heavily in training and capability development to keep specialists up to date and motivated. Overall, all cases showed the impact of digitalization on F&A specialists, specifically in terms of workforce adaptation.

Comparative analysis on the adoption and implementation of digital technologies

Across all cases, a common theme emerged: the need for F&A specialists that could seamlessly integrate digital solutions into their daily operations. F&A specialists had to evolve in tandem with the technology they were using. Resistance, initially prevalent in some cases, was gradually overcome through strategic measures. Retraining and upskilling initiatives played a crucial role, allowing F&A specialists to feel empowered rather than threatened by digitalization. Addressing challenges such as job displacement fears, work–life balance, and adapting to evolving technologies were central themes across all cases. Moreover, the cases highlighted the importance of a holistic approach, encompassing not just technical training but also addressing psychological factors, intrinsic motivation, and individual growth aspirations. Digitalization also brought forth new challenges, highlighting the need for a proactive, adaptive, and empathetic approach toward F&A specialists. This transformation was not just about adopting digital tools but fostering a culture where specialists felt supported, motivated, and capable in the face of technological advancements.

Throughout the case study analysis, the findings can be explicitly linked to ROT by illustrating how F&A managers orchestrate resources. In Case 1, managers structured a dedicated digital team within the F&A function to focus on automation, aligning with the ROT concept of structuring resources. Case 2 emphasis on integrating IT and F&A teams shows resource bundling, while leveraging digital technologies like AI for predictive analysis highlights the resource leveraging aspect of ROT. Each finding demonstrates the application of ROT principles in a practical setting. We summarized our findings in Table 3.

Discussion

We discuss our findings by analyzing how managers orchestrate their resources to answer the research question: How do F&A specialists adopt and implement digital technologies to transform financial processes and enhance decision-making in their organizations?

Under the lens of ROT, we focus on the integration of resources to support the adoption and implementation of digital technologies (Sirmon et al., 2011, p. 1392).

Resource orchestration

The findings extend ROT by demonstrating its relevance in digitally transforming F&A functions by illustrating how F&A managers orchestrate resources. Managers structured a dedicated digital team within the F&A function to focus on automation, aligning with the ROT concept of structuring resources (case 1 and 3). From a resource bundling perspective managers put emphasis on integrating IT and F&A teams (case 2 and 4). When addressing resource leveraging all case studies show that ROT can be applied not only to human resources but also to digital technologies when mobilizing and coordinating resources. From a digital technology view, some human decision-making management tasks are automated introducing digital managers. As a result, we refine ROT by

Table 3. Key findings across four case studies.

Constructs	Case 1	Case 2	Case 3	Case 4
F&A processes	Increased value of the F&A function through improved understanding and analysis of E2E business processes	Prioritized standardization and uniformity in their digitalized F&A processes	Streamline business processes and enhance collaboration by means of robotization	Modularization of business processes as a prerequisite for digitalizing F&A services
Digital technologies	Digital technologies are coordinated by a dedicated digital team as part of the F&A function	Digital technologies are integrated with the firm's global IT and digital transformation journey	Digitalization is organized into two departments 1) IT platforms by the IT department and 2) digital technologies by the F&A function	Digital technologies support the F&A function with a focus on realizing customer benefits
Decision-making	Digital technologies are used to streamline routine-based decisions to enhance efficiency	Decision rights are digitalized for routine tasks specifically	Focus on achieving efficiency opportunities by automating routine-based decision-making	While automating routine-based decision-making complex financial decisions still rely on human judgment
Consumer-orientation	Development of seamless financial services by exploring digital features that simplify F&A processes and increase employee satisfaction	Continuous alignment between F&A function specialists and business representatives to meet evolving business needs	F&A function applies a customer-oriented approach that is based on a demand management strategy	F&A function ensures that financial services are tailored to meet customer needs effectively
Impact of digitalization on F&A specialists	F&A function aims to be a digital native entity, prioritizing a "*Digital First*" approach	Initial resistance from F&A specialists concerned about job displacement due to automation.	Digitalization led to fundamental changes in job roles, necessitating adaptability and continuous learning	Focus on a skilled F&A workforce by investing in internal capability and competency units supported by a culture of continuous learning

including technological resource orchestration. This refinement helps managers balance the integration of human judgment with automated decision-making, offering new insights into managing the intersection of digitalization and resource orchestration in complex, data-driven environments. Consequently, managers show an empowering leadership style to overcome resource integration barriers by facilitating F&A specialists to collaborate with business and IT representatives intensively.

Based on the analysis, the mobilization and orchestration of resources are crucially influenced by the actions of managers. We found various examples in which managers mobilized internal resources. For instance, F&A managers proactively aligned their financial processes with business managers and IT department managers to explore improvements by means of digital technologies. By mobilizing resources, they discussed the way F&A processes and digital technologies can be standardized to further improve the effectiveness of F&A services. F&A and IT managers paid attention to how to integrate resources in the domain of F&A. This is consistent with the findings of Grøgaard et al. (2022) who find that firms that integrate certain activities and resources are better able to free up resources that were used for non-value creating activities. We found that managers made agreements about who will be responsible for coordinating these activities, which refer to the factor decision-managing (Alreemy et al., 2016). Our findings operationalize the governance challenge stated by Arnaboldi et al. (2017) as digital technology responsibility split has been established between the F&A digital team and IT department.

Based on our analyses, we find that the F&A digital teams collaborated intensively with business and IT department specialists as knowledge sharing has become an important element in providing knowledge-intensive services. Literature indicates that knowledge transfer between departments and specialists is an important aspect that may overcome digital anxiety (Firk et al., 2024). The findings of our study shed light on how F&A, IT and business departments develop mechanisms (townhall meetings, awareness sessions, videos, and demos) that may overcome digital anxiety. To actualize F&A services on a regular basis, it is vital to verify if the required quality of services still fits with the provided F&A services functionality (Wisna, 2013). We suggest that firms invest in building knowledge sharing mechanisms supporting information exchange.

Shifting boundaries

Knudsen (2020) argues that the effects of digitalization on a firm's F&A function are assumed to impact the boundaries of accounting, and as such the F&A function. Our analysis revealed that indeed, digitalization is the impetus for increasingly elusive boundaries of F&A. We operationalized Knudsen's (2020) assumption by focusing on firms' F&A function, which established an internal digital team to experiment and manage digital technology solutions. As F&A and digital technologies services are intertwined, we argue that the F&A function

operates in a hybrid mode providing F&A services as well as "lightweight IT" services. As a result, the boundaries of the F&A function itself become more unclear.

Our analyses show that end-users of F&A services are unaware of the shifting boundaries of the F&A function as they focus on the service functionality strictly. This corresponds to the concept of "opaque indifference" as the organizational entity who provides digital technologies are not seen or known. Literature on "opaque indifference" in the context of business process outsourcing, which include F&A services (Thion et al., 2016), shows that end-users are indifferent to location of the service (F&A function or IT department) as long as the service "meets their expectations in terms of efficiency, effectiveness, assumption of risk and price" (Wreford et al., 2012).

We find that digital technologies are predominantly managed within the F&A function. Interviewees responded that the rationale to develop and maintain these "lightweight IT" solutions provide new insights and learnings as experimenting digital technologies contribute to innovate F&A services. This finding is consistent with research of Willcocks et al. (2018) who argued that capabilities required for digital innovations are developed over time, which contrast with a transactional or ad-hoc approach. Consequently, our findings provide insights into how digitalization enables a shift that go beyond transactional F&A tasks (Bhimani & Willcocks, 2014) by developing digital capabilities within the F&A function.

The concept of "From Elusive to Opaque Boundaries of the F&A Function" reflects the evolving nature of F&A roles as digital technologies are integrated into these functions. As digitalization progresses, the traditional boundaries of the F&A function, which were once clear and well defined, are becoming more elusive and harder to pinpoint. With the growing use of digital technologies, F&A specialists are no longer confined to routine transaction processing. Instead, they engage in more strategic roles that overlap with technology management. This shift creates "opaque" boundaries, where it becomes increasingly difficult to distinguish the F&A function from digital and IT responsibilities. As F&A teams take on tasks traditionally managed by IT, such as managing RPA and AI implementations, their role becomes more hybridized, requiring both financial expertise and technological proficiency.

Based on our analysis, we developed a practical framework for the transformation of the F&A function. As digitalization is the impetus for increasingly elusive boundaries of the F&A function, Figure 1 shows that both digital technologies, and the need to focus on customer-orientation affect F&A specialist's skills and capabilities. Moreover, they transform existing End-2-End F&A processes continuously as new digital technologies evolve over time. In parallel, digital technologies and customer-orientation also transform decision-making as they can be digitalized step by step (see Figure 1).

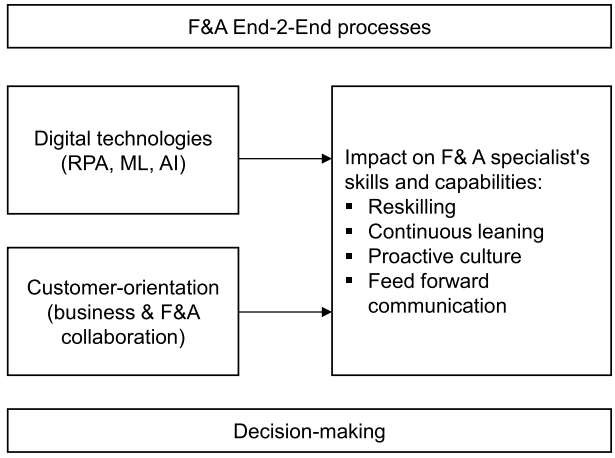

Figure 1. Framework for the transformation of the F&A function.

Conclusion

The present research investigates how digitalization shapes the elusive boundaries of the F&A function. Literature demonstrates that most of the studies on digitalization in the F&A domain are largely conceptual (Appelbaum et al., 2017; Arnaboldi et al., 2017; Knudsen, 2020). However, there are some exceptions, such as the impact of digitalization on the controller's job roles (Oesterreich et al., 2019), and digital anxiety in the finance function (Firk et al., 2024). Based on four case studies positioned around the F&A function, we contribute to the call of Knudsen (2020), suggesting for more research to empirically investigate how F&A specialists operate in the adoption and implementation processes of digital technologies (p.15). The results of this research enable us to better understand how digitalization shifts the boundaries of the F&A function, and more specifically how digital technologies impact the role of F&A specialists. The research findings also support the proposition that bundling internal digital teams with IT departments enhances F&A efficiency in decision-making and process automation. By collaborating closely, these teams streamline the integration of digital technologies, enabling faster, data-driven decisions. This synergy allows for more effective deployment of technology, improving both the accuracy of financial operations and freeing up resources for strategic tasks, ultimately leading to higher overall efficiency in F&A functions.

Practical implications

The practical implications for managers and practitioners in F&A functions are significant. To effectively navigate the digital transformation of F&A, managers should prioritize continuous upskilling and training of their teams to reduce the risk of job displacements and adapt to emerging digital technologies. Additionally, fostering close collaboration between F&A and IT departments will be crucial for implementing and maintaining digital solutions that optimize processes and decision-making. Managers should also balance automation with human oversight, particularly for non-routine tasks, to ensure compliance and risk management. Lastly, a customer-oriented approach, leveraging digital technologies to enhance service quality and satisfaction, can drive value for both internal and external stakeholders.

Limitations and future research

This research is not without limitations. First, we only studied four case studies, which therefore limit the generalizability of the results, as the unique contexts of these cases might not reflect broader trends in F&A digitalization across different sectors. Since the data is collected from interviews with F&A specialists and managers, there is a possibility of bias or subjectivity in the responses. Personal opinions and experiences could influence the insights, which may not fully capture objective realities. We acknowledge this limitation and encourage other researchers to study this phenomenon in more detail. Interestingly, future research may delve deeper into specific F&A roles. It can be assumed that digitalization will affect the required knowledge and skills of F&A specialists significantly. The research examines firms that have successfully adopted digital technologies, potentially overlooking challenges or failures in less successful implementations, which might provide a more comprehensive view of digital transformation in F&A functions. Furthermore, as F&A functions established internal digital teams, future research may study how various types of data (structured/unstructured) influence the elusive boundaries of F&A. Exploring the nuanced dynamics of cross-boundary collaborations, delving deeper into the role of digital technologies, and investigating the impact of environmental factors on resource orchestration represent promising avenues. Lastly, this research focuses on lightweight digital technologies and may not account for the impact of other emerging technologies or broader digital strategies that could affect F&A functions in different ways. Future research may address other emerging technologies and explore how evolving digital strategies may affect the F&A function.

Finally, while this paper discusses the efficiency gained through automation but did not delve into the ethical considerations, particularly in algorithmic decision-making. Issues such as transparency, accountability, and bias in AI-driven financial processes are critical. Future studies are suggested to address concerns about how automated decisions, especially in areas like fraud detection or compliance, may impact fairness, lead to unintended consequences, or pose risks if not properly overseen. Emphasizing the need for a governance framework to manage these ethical challenges would add depth to the discussion on F&A digitalization.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendices

Appendix A

Interview questions

(1) How does digitalization affect <client's name> F&A strategy?
(2) What strategic goals can be expected or achieved when applying digital technologies?
(3) How do digital technologies affect F&A business processes? Please do elaborate on the type of digital technology that is used.
(4) How do digital technologies affect F&A decision-making mechanisms? Please do elaborate on the type of digital technology that is used.
(5) How do digital technologies affect F&A customer-orientation? Please do elaborate on the type of digital technology that is used.
(6) When using digital technologies, how does this affect employees' knowledge (or their daily routine processes)?
(7) How are employees' skills affected when applying digital technologies? Do they need to acquire new skillsets? Did you experience any resistance or hesitation toward implementing digital technologies?
(8) What type of mechanisms are used to strengthen employees' digital technologies knowledge and skills (e.g. education, learning on the job)? Specifically, do they need to improve their AI literacy skills through training and workshops?
(9) What barriers can be identified when adapting employees' knowledge and skills?
(10) How does the use of digital technologies cause degradation or enhancement of human worker skills over time?

Appendix B

Atlas.ti Concept map