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REVIEW

Characterising the digital transformation of IT consulting services–Results from a systematic mapping study

Meikel Bode | **Maya Daneva** | **Marten J. van Sinderen**

Services & Cyber Security, University of Twente, Enschede, Netherlands

Correspondence

Meikel Bode, Services & Cyber Security, University of Twente, Enschede 7500 AE, Netherlands.
Email: m.bode@utwente.nl

Abstract

Currently, the digital transformation of the provisioning of IT consulting services to clients forces many companies to reinvent their business models. While the importance of digital transformation is well recognised, very little has been done until now to closely examine the concepts characterising this phenomenon in the domain of IT consulting. This paper aims at mapping out what is currently known in scientific literature about the digitalisation of IT consulting service provisioning and its characterising concepts and approaches. Analysing 20 selected articles, we identified 10 concepts characterising the digital IT consulting and 14 areas considered to be candidates for inclusion in the design of digital IT consulting services. Moreover, we found only one approach to the digitalisation of service provisioning that was empirically evaluated. We conclude that (i) the digital transformation is multifaceted and characterised through many aspects; (ii) digital IT consulting services are primarily explored from business perspective, while research of stakeholders' needs, technical requirements, and designs of relevant artefacts is scarce; (iii) while individual solutions and practices that worked in real-world contexts are reported, very little empirical evaluation was done. Finally, we reflected on the limitations and on the theoretical and practical implications of this work.

1 | INTRODUCTION

IT consulting is a subsector of the service industry [1]. Scholars in Information Systems Research [2–4] define this sub-sector as the business of advising clients on how to conduct the digitalisation of their business processes. IT consulting is a highly integrative and knowledge-intensive activity strongly depending on the qualifications of both consultants and clients [1, 5]. In turn, consultants, especially their knowledge, experience, and current location, have a significant impact on the effectiveness, the efficiency, and the quality of the IT consulting service provisioning process.

In this paper, we use the term 'digitisation' to mean the transformation of physical resources (e.g., documents, letters) into digital resources; we refer to the term 'digitalisation' as to the use of digitised resources by IT systems to improve efficiency of the business; and we use the term 'digital transformation' to mean the leverage on digitalisation by adapting business processes to improve effectiveness of the business. This understanding of the three terms is in line with the definitions of Gartner [6, 7].

Currently, digital transformation of the provisioning of IT consulting services has been recognised as a necessary and disrupting phenomenon [8]. For example, the digital transformation renders the IT consulting increasingly more location-independent, which in turn calls for reinventing the ways in which client-consultant relationships are thought of and managed. As these relationships are at the heart of any IT consulting business, it also means reinventing the very business models of IT consulting. One example is McKinsey, a global management consulting firm, with its digital consulting offering called McKinsey Solutions [9]. It no longer requires a consultant to deliver services, which is a truly disruptive shift for a company that classically focuses on people and their knowledge.

The transformation to digital services and the adaption of existing business models to exploit those digital services and related processes in the context of IT consulting is investigated

in both the disciplines of Information Systems and of Consulting Research [10, 11]. The research output of these fields indicates increased interest of both scholars and IT consulting companies in approaches and artefacts supporting digitalisation initiatives in the IT consulting sector. For example, approaches such as the Decision Process for Virtualisation [12] and Overby's Process Virtualisation Theory (PVT) [13] as well as artefacts such as the eConsulting Store [14] and the McKinsey Solutions [9] have been designed to assist IT consulting companies in the digital transformation of their own service provisioning processes. However, despite the importance of digital transformation in IT consulting and the intense design activity towards artefacts and methods, a comprehensive state-of-the art review on the topic is still lacking, hampering the complete understanding of the characteristics of this phenomenon. To the best of our knowledge, very little work has been done so far to consolidate the publication output of the two research communities and, in turn, to provide an overview of published state-of-the-art knowledge on how the digitalisation of IT consulting happens, what concepts are used to characterise it, and what variety of approaches is there to help IT consulting companies realise digital IT consulting with predictable success.

Our paper addresses this gap by reporting results from a systematic mapping study (MS) of scientific literature published in the period January 2017–November 2021. We uncovered what is currently known about the phenomenon of digitalisation of IT consulting service provisioning and the concepts used to characterise it, according to existing peer-reviewed publications. Our motivation to map out the state-of-the-art research in this area is traceable to the following. First, if we have a deeper understanding of the phenomenon, we will be able to prioritise sub-areas and research questions (RQ) for the immediate attention of researchers. Second, if approaches to the digitalisation of IT consulting have been published along with evaluations indicating the strong and weak aspects of these approaches, then practitioners in IT consulting could benefit from potentially good practices that they might be willing to explore for fit in their projects.

This paper is organised as follows. Section 2 provides background and related work. Section 3 is on our research method, our RQ, our search strategy and its execution. Section 4 presents our findings and Section 5 discusses them. Section 6 is on the limitations of this work. Section 7 summarises our answers to the RQ and includes our reflection on the implications for both practitioners and researchers. Section 8 is on future work.

2 | BACKGROUND AND RELATED WORK

This section first provides the background for the most important forces that paved the way for the digital transformation of IT consulting services (Section 2.1). We then summarise the related work on digital transformation in IT consulting (Section 2.2).

2.1 | IT consulting and digitalisation

Scholars in Information Systems Research and in Consulting Research (e.g. [15]) indicate two important forces causing the digital transformation phenomenon of the IT consulting services: (i) globalisation [16, 17] and (ii) demographic changes [18]. As clients' organisations become global, IT consulting companies follow suit by establishing new locations in physical spaces and by entering digital spaces. Physical globalisation of IT consulting services means the provision of IT consultants on site, which in turn implies high costs and less flexibility. In contrast, digital globalisation avoids high expenditure on travel and buildings that allow working at a physical location, by investing instead in digital solutions to achieve digital consulting.

Second, demographic changes fuel the digital transformation of IT consulting due to reduced availability of experienced consultants and some generation-conditioned changing needs and expectations of the workforce in both IT consulting organisations and client organisations (e.g., 'Generation Y' or 'Millennials') [18]. Reduced availability of consultants often translates in consulting projects that are either under-staffed or last unacceptably long, which may ultimately mean loss of revenue. Moreover, generation-conditioned expectations and needs are causing a shift from traditional face-to-face consulting to constantly available, responsive, and flexible digital services consumed through the Internet on any device. This effect is observable much more clearly at the present time due to the Covid-19 pandemic. To address these needs, new digital consulting platforms and digital IT consulting services are necessary. In the IS field, to the best of our knowledge the topic of platforms and their contribution to the increased use of professional services has been investigated by [19]. These authors hypothesise that platforms might increase access to professional services such as medical and legal advice.

2.2 | Secondary studies on IT consulting digitalisation

In the fields of Information Systems Research and Consulting Research, there are four literature reviews [2, 20–22] that form the related work for our study. As part of preparing this paper, we compared them based on their authors' research goals and scope (Table 1). In what follows, we summarise the points made in these reviews and their implications for our work.

Kumar et al. focus on scholarly peer-reviewed journal papers published in a period of 30 years (1987–2017). Regarding this scope, Kumar et al. identified what they call 'major focus of IT consulting practices'. More in detail, based on 36 selected publications pertaining to the IT consulting as a facet of management consulting, Kumar et al. identified eight topics that formed the focus of IT consulting practices: IT training, auditing, project management, knowledge transfer, IT economics, security, competitiveness, and applications. The systematic literature review (SLR) of Kumar et al. had no emphasis on digitalisation of IT consulting itself. In contrast, our work is focussed explicitly on this phenomenon.

TABLE 1 Comparison between relevant Research and our Work

Reference	Research goal	Focus/Purpose of the literature study	Type of study	Is there emphasis on digitalisation of IT consulting?
[22]	To find IT practices adopted by IT firms for consulting with their clients and issues associated with them.	To identify 'major focus of IT consulting practices', the challenges associated with them and the solutions to deal with the challenges, by various firms and researchers, both in industry and academia	SLR, guidelines are not explicitly mentioned.	No.
[20]	To understand the streams of research in management consulting by looking at the ambivalent roles of consultants in driving management innovation as well as management fashions.	1. To identify drivers for management consulting success 2. To identify the roles of consultants. 3. To characterise client–consultant (c-c) relationships.	SLR, based on the guidelines of [23].	No.
[2]	To understand the digital business models in knowledge-intense service companies.	1. To identify the digital business models for management consulting.		
		2. To identify the ways in which these digital business models are developed.	SLR based on the guidelines of [24].	No. DT is recognised as part of digital business models; DT is treated from a business perspective, exclusively.
[21]	To analyse innovation process theories and approaches with a specific focus on service and digital innovation.	1. To identify how innovation processes are specifically shaped in different theories and approaches.		
		2. To identify which specific characteristics need to be added, changed, or removed to construct a service innovation process. 3. To identify how the influence of digital technologies is described in innovation–especially service innovation–process literature.	SLR, guidelines are not explicitly mentioned.	No.

Abbreviations: DT, Digital transformation; SLR, systematic literature review.

Furthermore, the work of Cerruti et al. reviews 50 years (1947–2017) of scholarly research on management consulting to uncover streams of research for the future [20]. The authors focussed on the drivers of consulting success, the role of consultants in the 21st century economic climate and the client-consultant relationships. The authors' conclusions emphasise the importance of the 'digital revolution' [8] as a disrupting phenomenon, however their SLR does not focus at all on digital transformation in the IT consulting sector.

Next, the review of Helmer et al. examines existing scientific and practice-oriented theories and approaches on innovation management and innovation processes to understand process aspects of service innovation [21]. The authors wanted to know how existing theories shaped service innovation. Based on a search in the innovation process literature, the authors selected 55 papers which provided insight into 25 approaches to innovation processes. The authors found only two approaches on innovation of digital services and conclude that 'important theories and approaches considered in practice might be missing' ([21], p. 2805). In contrast to these authors who took a single perspective as a theoretical lens, our work is focussed on the multitude of perspectives relevant to describe and understand the digital transformation (DT) phenomenon as it happens in the IT consulting services sector.

Finally, the work of Greff et al. concentrates on business models in knowledge-intense areas, including management consulting [2]. These authors treat the topic of DT one-sidedly and specifically from the business perspective. In contrast to Greff et al., in our research we want to know what other perspectives and concepts are used by the authors of publications on DT in consulting services. As we will see in our results (Section 4) and in our discussion (Section 5), our research extends what these authors reported.

3 | RESEARCH METHOD

For our research process, we adopted the guidelines of [25]. As these methodologists suggest, we devised a review process that includes three main phases:

Phase I. Planning the review. This involved the identification of the need for a review, the formulation of our RQ and the development of our research protocol.

Phase II. Conducting the review. This involved the identification of publications, the selection of studies, the quality assessment, the data extraction, and the data synthesis.

Phase III. Reporting the review. This phase involved the dissemination mechanism and the formatting of the review. The result of this work is presented in this paper.

Our planning work started in July 2019. After creating our research process and research protocol, we searched for literature sources at two points in time: first in August 2019, and second in November 2021. This two-step search was very important to cover the most recent publications in our area of interest. In what follows, we first describe our RQ (Section 3.1), then our search and selection strategy (Section 3.2).

3.1 | Research questions

The research objective of our systematic MS is to identify the state-of-the-art in IT consulting digitalisation. To this end, our MS sets out to answer the following exploratory [26] RQ:

- **RQ1**: What concepts for digital consulting exist and what synonyms are used for these concepts in published literature?
- **RQ2**: What are the themes treated in the literature on digitalisation of IT consulting?
- **RQ3**: What areas do published literature sources deem important for IT consulting organisations to include in the design of digital IT consulting services?
- **RQ4**: What are the applications of digital IT consulting reported in the published literature?
- **RQ5**: Which approaches to conduct the digitalisation of IT consulting are reported in the published literature?

We pose RQ1 because currently there are various terms used as synonyms to refer to the phenomenon of digital consulting. Uncovering the synonyms that published papers use will be a step towards establishing terminological clarity. It would also be helpful for researchers to get orientation when they want to identify and compare publications on this topic.

Furthermore, RQ2 is motivated by the need to understand the clusters of knowledge present in scientific publications. It is expected to reveal those themes that the authors write about in their papers on digitalisation of IT consulting.

RQ3, RQ4 and RQ5 build upon RQ2. RQ3 zooms into those areas that need to be considered for inclusion when designing digital IT consulting services for the future, according to the published literature. RQ4 is expected to shed light on the real-world applications of digital IT consulting. This helps us to understand the contexts in which digitalisation platforms, solutions, and solution-based practices were tried out. RQ5 is to understand the existing approaches that are proposed and evaluated. This is of help to everyone involved in the development or the use of digitalisation frameworks.

Since research in the context of the digitisation of IT consulting is a relatively young research field, our exploratory RQ aim to obtain as comprehensive as possible a picture of the state-of-the-art in the context of the digitisation of IT consulting. In doing so, we pave the way for subsequent research to be guided by potential research gaps.

3.2 | Search and selection strategy

We searched for articles in Scopus. We chose this digital library, as it is known as one of the very comprehensive databases of peer-reviewed literature [27, 28]. To define our search queries, we compiled a list of relevant search terms in Table 2.

To only get the latest results, we limited our search to sources published after January 1, 2017. Based on the listed terms in Table 2, we defined 24 search queries as presented in Table 3. All defined queries used the Scopus-specific field

TABLE 2 Basic terms for search queries

Perspective	Search terms
IT consulting	Service, consulting, IT consulting, business service, IT service, professional service, knowledge-intensive business service (KIBS)
Digitalisation	Digital transformation, digitalisation, innovation, software-defined business, API economy , virtualisation, data driven
Digital IT consulting	Consulting trends, digital consulting, asset-based, platform-based, service platform, online consulting, e-service, consulting platform, consulting service system, description language
Academic perspective	Consulting research

Abbreviation: API, Application Programming Interface.

TITLE-ABS-KEY meaning to incorporate the title, abstract and author-defined keywords into the search.

All search strings (Table 2) were experimented with by the first author (Bode), while the second author (Daneva) independently executed 25% of the strings. The two researchers worked in two different locations and had no interaction between themselves. The results of using the strings were compared and discussed multiple times with all co-authors until consensus was reached on the final set of strings [29].

In Table 4 we present our inclusion and exclusion criteria used during study selection.

As already indicated in Section 3, we searched for literature in two points of time, namely in August 2019 and in November 2021. After each search, we executed the steps of applying the inclusion and exclusion criteria (see Table 4), extracting data and synthesising the finding. The results of the second search (November 2021) have been incorporated into the findings of the first search. In Section 3.3 we present our two executed searches in detail.

3.3 | Processing the search results

3.3.1 | First search: 2019

Our paper selection process is depicted in Figure 1. By executing all queries, we ended up with 101 results (Stage 1). By applying inclusion and exclusion criteria as listed in Table 4 we filtered out 75 publications. After that stage, only 12 papers remained, which we processed further.

Table 5 presents these 12 papers. In this table, the third column indicates the type of research being reported in each paper. For this column, we classified the papers according to the research type facets proposed by [30] to investigate whether the contributions were of more conceptual nature or more empirical nature. We chose the classification schema of [30], because it has been recommended by SLR methodologists, for example, [29], and also because other authors of SLRs found it useful. As per [30], publications fall in the following categories: solution proposal research (articles proposing methods, techniques, and tools to problems) and evaluation research (i.e. articles analysing existing problems and the state-of-the art, or assessing methods and tools in context). The 12 papers range from case studies, literature reviews, empirical studies, design studies, overview articles, to SWOT analysis.

We searched the other digital libraries (Google Scholar, Association for Information Systems Electronic Library, Web of Science) for papers but could not find any which we could add to our list. There is an inherent problem related to the task of running the same query over multiple libraries. As methodologists acknowledge [29], each digital library has its unique facility and rules for forming strings and therefore a certain amount of manual work is needed to achieve an exact replication of a Scopus-based search in another library. We repeated the search only for those queries that included the most frequently observed keywords. These form around 30% of the 24 queries reported in Table 3. This, however, did not bring new papers.

3.3.2 | Second search: 2021

This section describes how we proceeded after executing the second systematic search (in November 2021). As we already mentioned, we repeated the search based on our 24 search queries (see Section 3.2). As before, we used Scopus. An overview of the search results is presented in Table 6. We found 1530 matches in sum for all our 24 queries. We analysed all results by reading their title and we selected 37 papers for reading their abstract which resulted in 8 papers which we read completely. All these 8 papers were then finally decided to be relevant.

Among the 8 papers in our final selection, two papers are from 2020 and 6 papers are from 2021. None of these 8 papers was dedicated to IT consulting only. The identified papers are presented in Table 7.

The following section reports the results of our analysis of the total of 20 papers (12 coming out of our first search and 8 coming out of our second search). We integrated the findings of the second batch of 8 papers with the findings of the first batch and will report them jointly throughout the result section.

3.3.3 | Data extraction and coding

After the selection of the 20 papers of our two searches, we started the data extraction process. For this, we followed the procedure of ([43], pp. 115–119). Specifically, to categorise the contained data, we applied the coding practices of ([43], p. 115) on each paper's content. We chose coding as our data analysis strategy based on the recommendation of Wolfswinkel et al.

TABLE 3 Search queries

ID	Query string
Q01	TITLE-ABS-KEY ('consulting') AND (TITLE-ABS-KEY ('digitalisation') OR TITLE-ABS-KEY ('digital transformation')) AND PUBYEAR >2016
Q02	TITLE-ABS-KEY ('it consulting') AND (TITLE-ABS-KEY ('digitalisation') OR TITLE-ABS-KEY ('digital transformation')) AND PUBYEAR >2016
Q03	TITLE-ABS-KEY ('it consulting') AND TITLE-ABS-KEY (innovation) AND PUBYEAR >2016
Q04	TITLE-ABS-KEY ('it') AND TITLE-ABS-KEY ('business service') AND TITLE-ABS-KEY ('innovation') AND PUBYEAR >2016
Q05	TITLE-ABS-KEY ('digital consulting') AND PUBYEAR >2016
Q06	TITLE-ABS-KEY ('data driven') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q07	TITLE-ABS-KEY ('asset based') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q08	TITLE-ABS-KEY ('service platform') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q09	TITLE-ABS-KEY ('platform based') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q10	TITLE-ABS-KEY ('consulting research') AND PUBYEAR >2016
Q11	TITLE-ABS-KEY ('software-defined business') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q12	TITLE-ABS-KEY ('API economy') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q13	TITLE-ABS-KEY ('it consulting') AND TITLE-ABS-KEY ('virtualisation') AND PUBYEAR >2016
Q14	TITLE-ABS-KEY ('it service') AND TITLE-ABS-KEY ('description language') AND PUBYEAR >2016
Q15	TITLE-ABS-KEY ('e-service') AND TITLE-ABS-KEY ('it consulting') AND PUBYEAR >2016
Q16	TITLE-ABS-KEY ('digital service') AND TITLE-ABS-KEY ('it consulting') AND PUBYEAR >2016
Q17	TITLE-ABS-KEY ('online consulting') AND PUBYEAR >2016
Q18	TITLE-ABS-KEY ('data driven') AND TITLE-ABS-KEY ('professional service') AND PUBYEAR > 2016
Q19	TITLE-ABS-KEY ('consulting platform') AND PUBYEAR >2016
Q20	TITLE-ABS-KEY ('service computing') AND TITLE-ABS-KEY ('IT consulting') AND PUBYEAR > 2016
Q21	TITLE-ABS-KEY ('kibs') AND TITLE-ABS-KEY ('consulting') AND PUBYEAR >2016
Q22	TITLE-ABS-KEY ('digital service') AND PUBYEAR >2016
Q23	TITLE-ABS-KEY ('professional service') AND PUBYEAR >2016
Q24	TITLE-ABS-KEY ('consulting service system') AND PUBYEAR >2016

Abbreviation: API, Application Programming Interface.

[44]. The practices of Saldaña include three rounds of coding called 'initial coding', 'second cycle coding', and 'third cycle coding'. The overall process is presented in Figure 2.

Our data extraction and coding process was executed by the first author in the leading role. For the data extraction, the first author set up a form, in which the following pieces of information were collected: title, authors, year of publication, type of study, language, country context, main ideas of the paper, passages of text that pertain to RQ1, to RQ2, to RQ3, to RQ4 and to RQ5, respectively.

For the coding, the first author took the lead in analysing the passages of text pertaining to each RQ. The second and the third author served as reviewers and did 'member-checking' [43], which gave them the opportunity to correct errors and

TABLE 4 Inclusion and exclusion criteria

ID	Criterion	Justification
IC1	The source should discuss digitalisation and/or innovational aspects related to consulting in general or IT consulting.	Many authors refer to the digitalisation in consulting in general as an emerging field and treat it from the perspective of innovation [8]. Therefore, we consider for inclusion innovation-focussed papers reporting digital transformation results of consulting in general, next to publications purely presenting digital transformation approaches in IT consulting.
IC2	The source should either be an empirical study dedicated to one or more consulting topics or should be a secondary study aggregating knowledge from other existing sources on the theme (i.e., a review).	We allow secondary studies to be included if published in 2017–2021, as these may treat published research dated before 2017 that is related to our topic of interest.
EC1	Sources which are not in English or in German are excluded.	In addition to English, we also allow German, as German universities have schools with a long tradition of research on business information systems and journals such as the international journal of Wirtschaftsinformatik (Business informatics) with a 50-year long history. In addition, SAP, one of the world's leading providers of digital transformation solutions and services, is a German company actively participating in industry–university research projects with German academic institutions. Since its founding in 1972, SAP has fostered the development of a large IT consulting ecosystem in the German-speaking countries of Austria, Switzerland, and Germany. Therefore, it was realistic to expect some relevant German-language contributions to our research.
EC2	Sources which are not published in peer-reviewed journals, conferences, or workshops are excluded.	We allow only sources that went through a peer-review to filter out low quality results.
EC3	Sources that are duplicated.	If a journal paper of the same authors on the same topic has been published after a conference or workshop paper, we consider for inclusion the most recent publication, that is, the journal paper.
EC4	Sources available only in the form of abstracts or PowerPoint presentations	To assure the quality of our sources, we include only scientific publications in the form of whole papers.

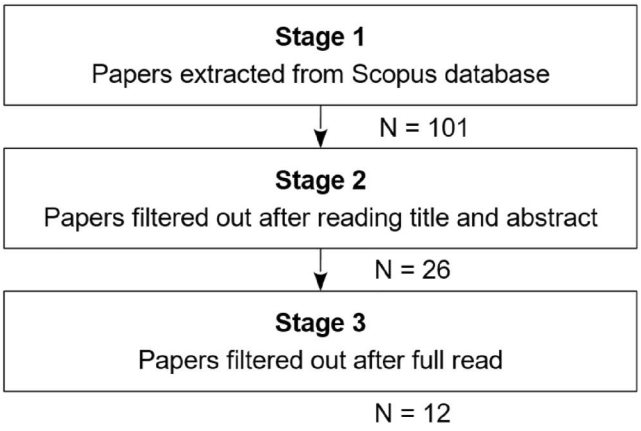

FIGURE 1 Stages of the paper selection process

challenge possibly wrong interpretations. The process worked as follows (Figure 2): First, we read all the papers multiple times to develop a good understanding of their content and the methodology used. Second, we conducted multiple rounds of coding. Starting with the first read of the papers, we marked relevant paragraphs and we took notes directly in the PDF documents. During subsequent reads, the marks and the notes were extended. With the final read of the papers, we started the first coding cycle using a spreadsheet. We copied all marked paragraphs from each paper to the spreadsheet. The spreadsheet contained the following columns: Text segment, Initial Code, Second Cycle Code, Third Cycle Code, Own Notes/Rephrased, Source and Page. We assigned the initial codes intuitively to all text segments. These are receivable from the authors upon request. During the second coding cycle we

TABLE 5 Overview of the final paper set in our first review

ID	Publication	Type of research	Context	Country/Language
P01	[31]	Evaluation (case study)	German IT company	Germany, English
P02	[16]	Evaluation (empirical quantitative study)	Public and company specific job portals	Germany, English
P03	[32]	Solution proposal (design study)	Prototype of a self-service platform	Germany, English
P04	[2]	Evaluation (systematic literature review)	Analysis of digital business models in consulting	Germany, German
P05	[33]	Evaluation (SWOT analysis)	Digital consulting in financial consulting	Germany, English
P06	[17]	Evaluation (overview article)	Analysis of trends in IT service	Russia, English
P07	[34]	Solution proposal (design study)	Consulting business models in the digital era	Germany, English
P08	[22]	Evaluation (systematic literature review)	IT consulting	India, English
P09	[11]	Evaluation (overview article)	Current state of digital transformation of business consulting in Germany	Germany, English
P10	[18]	Solution proposal (case study)	Organisation of future IT consulting firms	Germany, English
P11	[35]	Evaluation (empirical quantitative study)	Value creation in HR e-consulting	India, English
P12	[36]	Evaluation (empirical content analysis)	Analysis of consulting portfolio of major consulting companies	Germany, German

Abbreviations: HR, human resource; SWOT, strengthes, weaknesses, opportunities, threats.

TABLE 6 Query results from 2019 to 2021

Total matches	Results selected for abstract read	Results selected for full read	Final selection
1530	37	8	8

TABLE 7 Overview of the Final Paper Set for second Review

ID	Publication	Type of research	Context	Country/Language
PU1	[37]	Evaluation research (qualitative comparative analysis)	Digital transformation in management consultancies	Romania/English
PU2	[21]	Evaluation research (literature review)	Review of digital innovation literature in services	Germany/English
PU3	[38]	Evaluation research (case study)	Algorithmic consulting platforms and their success factors	Germany/English
PU4	[39]	Solution proposal (case study)	Strategic consulting through digital platforms in public administration	Ukraine/English
PU5	[40]	Evaluation research (longitudinal multiple case study)	Digital transformation in management consultancies	Italy/English
PU6	[41]	Solution proposal (a conceptual framework and approach)	Digital consulting in financial consulting	Canada/English
PU7	[19]	Evaluation research (literature review)	Digital platforms in professional services	Brasil/English
PU8	[42]	Evaluation research (empirical quantitative study)	Task automation in professional services firms	USA/English

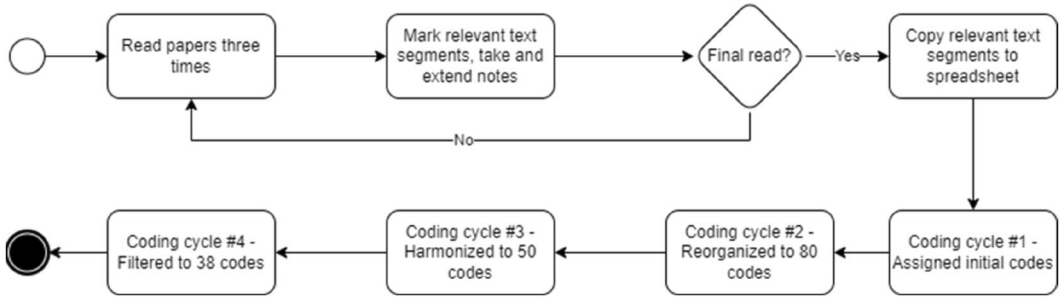

FIGURE 2 Our data extraction and coding process

reorganised the codes, rephrased, and generalised them so that we ended with 80 codes.

During our third coding cycle we re-read all text segments and redefined the codes from the second round. After the third cycle, we finally reduced the number of codes to 50. As these became very general, we also reworked the second cycle codes, so that we were able to use them as less general sub-categories of our third cycle codes (considered as super-categories). After the categorisation, 38 final codes remained (Table 8). In Table 9 we give a short example of our coding process for four text segments which we assigned to our final code 'collaboration models' (this is the rightmost column). We discuss the final 38 codes in detail in the next subsection.

3.3.4 | Our analytical activity: from final codes to theme clusters

The 38 final codes are presented in Table 8 and are ordered by the count of their occurrences (the third column). As we can see, the most frequently mentioned code is 'reasons for digitalisation of IT consulting' (55 occurrences).

Furthermore, our analysis of these codes was targeted on clustering them into higher level categories or themes. These theme clusters are listed in Table 10, in relation to our identified papers. For each combination of theme cluster and paper, Table 10 shows the per-paper theme importance. We define 'theme importance' as the ratio of the number of text segments related to one of the theme clusters to the total amount of text segments we extracted from that paper (Equation 1). The importance level is then used to capture topics and focal points of ongoing discussions in the domain.

Equation 1: Per Paper Theme Importance

$$\text{per paper theme importance} = \frac{\text{number of text segments on theme cluster in paper}}{\text{total number text segments extracted from paper}}$$

The maximum value was 0.78. We defined the clusters to be low ($>0.0 \leq 0.26$), middle ($>0.26 \leq 0.52$) and high ($>0.52 \leq 0.78$). Values of 0.0 indicate that the theme was not reported at all. If we did not find a theme in a publication, we consider it to be 'not reported'. Table 10 shows the distribution of importance levels per paper.

4 | RESULTS

As indicated, in this section we present our combined findings from both searches covering 20 selected papers in total.

4.1 | Findings pertaining to RQ1: digital consulting concepts and synonyms

Our reviewed sources indicate 10 distinctive digital consulting concepts which are presented in Table 11. Therein, the third column describes the meaning of each concept as we perceive it. Possible synonyms are assembled in the fourth columns. The fifths column refers to the publications where the concept occurred. For example, the terms 'Consulting 4.0' and 'E-Consulting' are used interchangeable, whereas 'Technology-Driven Consulting' is a term on its own.

Based on our analysis and the identified digital consulting concepts and possible synonyms we formulate the following definition of digital IT consulting services:

Digital IT consulting services are technology-based consulting services represented by standardised, modularised, re-combinable, reusable, and customisable service assets that carry specific service commitments and are provided either in an automated, hybrid, or manual mode by human and/or technical agents or in a self-service manner and are instantiated, delivered, monitored, and orchestrated by digital consulting platforms.

4.2 | Findings pertaining to RQ2: themes

The answer to RQ2 is grounded on codes in Table 8 shown in Section 3.3.4. As already indicated in Section 3.3.4, we grouped the 38 codes shown in Table 8 into ten higher-level theme clusters. Table 10 matches these 10 clusters against the papers in our selected set of 20 identified during the first and the second search. Therein, the labels TC01 to TC10 stand for 'Theme Cluster' (TC). The second column (number of citations) was added to indicate the impact, assuming that more-cited papers have a higher impact than less-cited papers. The cells in the table indicate the importance level (low, middle, or high) of each TC per publication. If we did not find a theme in a publication, we consider it to be 'not reported'.

TABLE 8 Final codes

ID	IT consulting field	Number of occurrences	Publication
F01	Reasons for digitalisation of IT consulting	55	[2 , 15 , 16, 18, 19, 31, 33 –35, 39–42]
F02	Service automation	31	[2, 15– 17, 19, 31– 33, 38, 39, 41, 42]
F03	IT consulting market	28	[15– 17, 19, 21, 31, 33, 35– 41]
F04	Future IT consultant skillset	26	[15, 16, 18, 34, 36, 38–40, 42]
F05	Platform-based consulting	24	[2, 15, 31–34, 38, 39, 41, 42]
F06	Digital business models	22	[2, 15–17, 31–34, 36–38, 40, 41]
F07	Digital consulting product	22	([2, 31, 33, 38], p. 20; [15, 17, 22, 34, 36, 40])
F08	Digital consulting platform	17	[2, 15, 17, 19, 31, 33–35, 42]
F09	Collaboration models	17	[15, 17, 31, 34–36, 38, 40]
F10	IT consulting digitalisation	17	[2, 15, 16, 21, 31, 35, 37]
F11	Reasons against digitalisation of IT consulting	16	[19, 32, 33, 42]
F12	Digital strategy	15	[15, 17, 31, 34–41]
F13	Digital maturity	13	[15, 16, 18, 19, 34, 35, 37, 41, 42]
F14	Digital culture	13	[17, 18, 31, 34, 36, 39]
F15	Digital mindset	10	[18, 31, 34, 35, 37, 40–42]
F16	Competitiveness	9	[15–17, 22, 33]
F17	Knowledge management	9	[2, 16, 17, 19, 22, 31]
F18	Digitalisation	7	[21, 37, 39, 40]
F19	Digital projects	7	[15, 16, 22, 34, 40]
F20	New generation actors	6	([31, 33], p. 20; [18, 34, 36])
F21	Organisational change	6	[15, 18, 31, 34, 40]
F22	Availability of scientific digital consulting artefacts	6	[2, 15, 32, 38]
F23	Mobile consulting	5	[15, 17, 36, 39]
F24	Consulting digitalisation methodology	5	[15, 21, 33, 34]
F25	Cognitive consulting	5	[15, 17, 40–42]
F26	Complementation of classical and digital consulting	4	([33], p. 20; [15, 38, 40])
F27	New customer segments	4	[15, 33, 34, 39]
F28	Knowledge-intensive services	3	[2, 19, 37]
F29	Relevance of IT consulting	3	[18, 31, 33]
F30	Crowd-based consulting	3	[2, 15]
F31	Globalisation	3	[16, 17, 40]
F32	Digital consulting quality	2	[33, 35]
F33	Demographic change	2	[18]
F34	Co-creation of value	2	[34, 35]
F35	Communication	2	[31]
F36	Digital leadership	2	[34, 36]
F37	IT security	1	[15]
F38	Cloud technologies	1	[39]

TABLE 9 Example of the 3-phased coding process

Text segment	Initial code	Second cycle code	Third cycle code
'This not only means an ongoing development of the consulting as such, especially regarding technical trends and collaboration models' [34]	Collaboration models	Collaboration models	Collaboration models
'Both customers and IT service providers expect new contact models to be used—another trend. This will help make IT outsourcing more interpersonal and financially beneficial.' [17]	New contact models	Collaboration models	Collaboration models
'[e-consulting] It acts as a platform to bridge the gap between the consultants and their client companies' [35]	Platform-based consulting	Digital consulting platform	Collaboration models
'By rethinking the delivery model of consulting, interaction with clients can be redesigned and new customer segments can be opened up' [15]	New interaction models	Collaboration models	Collaboration models

Referring to Table 10, we report in the next subsections our findings as pertaining to each theme cluster. Section 4.2.1 reports findings related to the contextual factors of digital consulting (TC01). Section 4.2.2 elaborates on consulting market related topics (TC2) followed by digital business models (TC3) in Section 4.2.3. Arguments for (TC4) and against (TC5) the digitalisation of consulting are presented in Sections 4.2.4 and 4.2.5. Section 4.2.6 reports prerequisites for consulting digitalisation (TC6) and Section 4.2.7 presents findings on how this can be achieved (TC7). The execution examples of digital consulting (TC8) are topics for Section 4.2.8. Sections 4.2.9 and 4.2.10 report the existing forms of digital consulting (TC9) and findings on the future of digital consulting (TC10).

4.2.1 | Contextual factors of digital consulting

When treating the context of digitalisation of consulting in general, the authors of our included sources paid attention to the following contextual characteristics that potentially influence the ways in which the provisioning of digital consulting services take place:

(i) globalisation as a major trend and driver for transformations, for example, into automation and new business models [16, 17, 38, 40],
(ii) urgency of digitalisation to respond to technology induced dynamics to stay competitive [16, 38, 40, 41], or provide, for example, professional [19], public, and civil services better [39], and
(iii) demographic change that leads to a decreasing availability of sufficiently qualified experts [18, 40].

4.2.2 | IT Consulting Market Change Scenarios

According to 12 of our 20 selected papers, the IT consulting market is undergoing a rapid change. Multiple change scenarios are possible: (i) intensified consolidation and concentration [16, 17, 19, 40] through mergers, acquisitions, and strategic alliances, to achieve better market access; (ii) increasing importance of technology giants and relatively early technology consulting in contrast to the declining importance of IT strategy and operations consulting firms [31], which used to have a sequence of consulting activities that began with the engagement of strategy, then operations, and only finally technology consultancies; (iii) homogenisation of service portfolios across IT consultancies [17] that leads to a decreasing possibility to differentiate IT consultancies from each other. For the consultancies it is hardly possible to differentiate from competitors and for clients as they see themselves confronted by hardly distinguishable service offerings; (iv) increased integration of digital products and solutions into IT consulting service portfolios [11, 40] as a possibility to become again better distinguishable from competitors regarding the IT consulting service portfolio; (v) the melting of clearly differentiable consulting domains to omnipresent digital ecosystems consisting of closely related market entities [36]; and (vi) the increasing provisioning of IT consulting services through internet-based technologies 'to businesses, groups, and individuals' ([35], p. 161).

4.2.3 | Digital business models

In 13 out of 20 papers, the authors touch the topic of digitalised consulting business models [2, 11, 16, 17, 31, 32, 34, 37, 38, 40, 41]. The term 'software-defined business' [31] reflects that discussion well, as it shows that digital business models directly rely on information technology [16, 31, 38, 40, 41] and might be modelled in software. Entire end-to-end value chains are envisioned to be changed or replaced [31]. Digital business models promise to be more cost-effective [40], to be more accessible, and to attract potential new customer segments [33, 38]. This all is assumed to help consulting firms to stay competitive [36]. Comprehensive digitalisation of business models also requires rethinking support processes, like the conception and the introduction of new billing models [11].

4.2.4 | Why digitalise IT consulting?

In 11 of our 20 selected papers in this MS, the authors indicate a variety of reasons for IT consulting companies to digitalise their business models.

TABLE 10 Importance of Theme Cluster related to Digitalisation of Consulting

		Theme clusters									
Source	# Cites	Contextual factors of digital consulting TC01	IT consulting market change scenarios TC02	Digital business models TC03	Why digitalise IT consulting? TC04	Why not digitalise IT consulting TC05	Prerequisites for digitalisation TC06	How to digitalise IT Consulting? TC07	Execution examples of digital consulting TC08	Forms of digital consulting TC09	Future of digital consulting TC10
[31]	3	◇	◇	◇	◇	-	◈	◇	◇	◇	-
[16]	3	◇	◇	◇	◇	-	◆	◇	◇	-	-
[37]	0	◇	◇	◇	-	-	◇	◈	-	-	◇
[32]	2	◇	-	◇	-	◇	-	◇	-	◈	-
[2]	1	◇	-	◇	◇	-	◇	◇	-	◈	-
[21]	0	-	-	-	◇	-	-	◆	-	-	-
[33]	17	◇	-	◇	◈	◇	◇	◇	-	◇	◇
[38]	0	◇	◇	◇	◇	-	◇	◇	-	◇	◇
[39]	5	◇	◇	-	◆	-	◇	◇	-	-	-
[17]	1	◇	◇	◇	◇	-	◇	◇	◇	◈	-
[34]	1	-	-	◇	◇	-	◈	◇	◇	◇	-
[22]	0	-	-	-	◇	-	◈	-	◈	◇	-
[19]	0	◇	◈	-	◈	◇	◇	-	-	◇	-
[11]	0	◇	◇	◇	◇	-	◇	◇	◇	◈	◇
[18]	0	◇	-	-	◇	-	◆	-	-	-	-
[35]	1	-	◇	-	◈	-	◈	◇	◇	◇	-
[42]	8	◇	-	-	◈	◇	◇	-	◇	◇	-
[36]	1	-	◇	◇	-	-	◆	-	◇	◇	-
[40]	5	◇	◇	◇	◇	◇	◈	◇	◇	◇	-
[41]	3	◇	◇	◇	◇	-	◇	◇	◇	◇	◇
Rank		6	5	8	2	10	1	4	7	3	9

Note: TC*xx*: Theme Cluster ID. Importance Level of Theme: ◇ = low, ◈ = middle, ◆ = high, - = Theme not Reported.

TABLE 11 Identified digital consulting concepts and synonyms

ID	Digital consulting concept	Description	Synonyms	Publication
C01	Algorithmic consulting	Consulting by means of automation of building blocks of the consulting process by digital agents or programs	Robo-advisory	[11, 38, 41]
C02	Asset-based consulting	Definition of consulting reusable consulting packages		[11, 40, 45]
C03	Consulting 4.0 (Beratung 4.0)	Reference to the term Industry 4.0	E-consulting	[2, 38]
C04	E-consulting	Electronic consulting	Consulting 4.0	[35]
C05	Platform consulting	Consulting through digital platforms	Platform-based consulting	[32]
C06	Platform-based consulting	Consulting through digital platforms	Platform consulting	[11]
C07	Robo-advisory	Consulting by means of digital agents or programs	Algorithmic consulting	[33, 41]
C08	Self-consulting	Externalisation of parts of the service provisioning to the client	Self-service consulting	[32]
C09	Self-service consulting	Externalisation of parts of the service provisioning to the client	Self-consulting	[11]
C10	Technology-driven consulting	Consulting by means of information technology		[40]

First, the competitors are becoming homogeneous regarding their service portfolio. One possibility to stay competitive [17, 31, 40], create lasting barriers [11, 40], and distinguish themselves from the other competitors in the market is to shift from classical consulting approaches to a digital software-defined business [18, 31, 40] or algorithmic consulting business [38, 41]. This can be realised by introducing innovative services, even if the knowledge of how to conduct that is rarely available yet [11]. Second, start-up companies request other digitalisation services from IT consulting companies as they stand for a new *digital normal* [34]. Third, client companies formulate new requirements regarding the speed, the flexibility, and the reliability of services [31, 39]. Fourth, digital services scale better (over proportional or exponential) than classical analogue services [38–40], which show linear scaling [2]. Fifth, a digital platform-based business is expected to show network effects, for example, due to joint service provisioning of independent partners [38]. Finally, another reason for carrying out digitisation lies in artefacts that have already been digitised, which entail further digitisation activities [37]. We use the term artefact in the sense of design science in line with [26, 46].

4.2.5 | Why not digitalise IT consulting?

We found that there are few arguments against the digitalisation of IT consulting. Only five papers [19, 32, 33, 40, 42] out of our 20 address this aspect. Emrich et al. see 'higher complexity, higher dynamics [and] higher uncertainty' ([32], p. 1309) regarding digitalisation activities. Other authors state that there has been only little experience with digital services until now, which rises concerns [33]. Examples of such concerns are related to the acceptance of digital services on both the clients' and consultants's sides, the need to establish a change process to be successful [40], the limited customisability, and the reduced personal contact or its total loss during the service provisioning [33]. Sampson argues that the professional service jobs are very knowledge-intensive and are therefore hardly to automate, which is linked to their ability to be digitalised [42]. Nishikawa and Orsato think that certain consulting domains, such as 'technology developers […] are less prone to the platform business model' ([19], p. 8).

4.2.6 | Prerequisites for digitalisation

The prerequisites for digitalisation are frequently discussed by the authors of our selected papers. We cluster these prerequisites into actor-related and organisation-related.

First, our selected literature in this MS emphasises that new generations of actors arise [34]. Actors in our sense are the consultants, employees of client firms as well as technical systems (e.g., consulting platforms, robo-advisors). Future consultants need to change their understanding on how to consult. In fact, a future IT consultant skill set is required. It consists out of knowledge of agile methods (e.g., DevOps), coding skills, extensive technical know-how and the ability to translate (business) strategy to the technical level [17, 34, 40]. Additionally, digitalisation requires consultants to develop a digital mindset, which combines 'business-, IT- and data driven-thinking' ([47], as cited in [34], p. 1275) as well the ability to fulfil new roles such as the supervising of digital consulting provisioning processes [38].

At least five of our selected papers focus on relevant organisational topics. The organisational change requires consulting companies to rethink their structures, their roles, and their rules [15, 18, 31, 34, 40]. Furthermore, new payment models for consultants may become relevant [34]. With focus on the management level of the consulting firms, some authors

of papers in this MS require it to develop digital leadership [34, 36]. However, these authors gives no hint what that exactly means, except that it relates to a digital culture [34]. A digital culture is characterised by agility, continuous improvement based on internal and external feedback, constant measurement of defined activities to provide a higher business value, and new models for participative consulting and contracting [31, 34]. Another organisational topic is the development of a digital strategy especially with a focal view on execution of the future business, which will show the melting of innovation-, strategy- and IT consulting [34, 37, 38]. Consulting firms need to develop new digital and software-defined business models [17, 31]. They need to discover new areas for future business, define new targets for growth, and develop innovative services [17]. Furthermore, knowledge management is an organisation related topic, which has been identified as an important competitive advantage in the consulting sector [22]. As the digital technologies are volatile, consulting firms need to conscientiously and permanently, collect and update their knowledge as well as the skills of their consultants [17]. This can be supported by knowledge management systems, such as problem databases [2]. Hence, digital and hybrid learning approaches are becoming more relevant for the consultants [17, 22]. Between consultants, departments, and projects, the transfer of knowledge becomes more important [22], especially from the perspective of agile methodologies [31]. One of the selected papers emphasises the digital maturity of the consulting market, the consulting firms and the client companies including their respective staff [34]. This means that a consulting company could develop and offer highly innovative digital IT consulting services and solutions, but that the client companies are not mature enough to either understand that respective offer or even consume it (or vice versa). Hence, both parties need to reach a certain digital maturity to be able to act successfully within a digitalised IT consulting market.

4.2.7 | How to digitalise IT consulting?

Fifteen out of our 20 papers either implicitly or explicitly discuss the means for digitalisation. The authors of these papers concur on the virtualisation as the means to use. Related to IT consulting, it is the virtualisation of its 'services, sequences, modules or processes' ([34], p. 1275). Virtualisation is the reduction of person-to-person interaction and its substitution with digital equivalents (e.g., replacement of paper-based questionnaires with web-based questionnaires). A methodology for virtualisation is the PVT of Overby [48] mentioned by [11]. However, as a knowledge-intensive service, IT consulting requires special methods to conduct the digitalisation of its business models [2].

As another means to digitalise IT consulting services, some authors discuss to either replace or augment them by artificial-intelligence-based services [17, 33, 41]. Those services could be offered as stand-alone solutions or to monitor the service provisioning of consultants or automated platform-based service provisioning processes.

In any case, the authors of the papers we have selected in this MS argue that the digitisation of consulting is an iterative process [21, 37]. Helmer et al. propose an 'digital innovation process for services' based on the analysis of 25 concepts, that could be helpful also for the digitalisation of IT consulting services [21].

4.2.8 | Execution examples of digital IT consulting

Referring to our findings regarding identifying examples for the execution of digital IT consulting services, the following points are relevant. The execution of digital IT consulting is tightly connected to new external and internal collaboration, contact, and delivery models [15, 17, 31, 34]. Digital platforms serve as bridges between consultancies and clients to provide e-services [35]. Social technologies should also be part of the service delivery process [15, 17, 36]. Overall those platforms support co-creation of value [34, 35].

Related to digital consulting is the execution of digital projects, which are different from classical projects with respect to their structure and phases [16, 22, 40, 47]. Project teams must conduct multiple consulting projects simultaneously, which leads to problems related to project deliverables and required tools [22].

4.2.9 | Forms of digital IT consulting

Ten out of our 20 selected papers provide insights into the building blocks that IT consulting companies might want to consider for inclusion in the designs of their digital processes and services. According to the 10 papers, these building blocks are: (1) knowledge assets [22], such as best practices [17], (2) packaged *softwarised* products [31] such as robo-advisors [33, 41], and (3) technology-based products [36], such as self-learning cognitive consulting services based on artificial intelligence [11, 17, 40–42]. These three types of consulting services can be considered *consulting assets* [11, 40, 45]. Eight papers indicate the following as the possible characteristics of asset-based consulting services: (i) standardisation [11, 17, 33], (ii) customisation [33], and (iii) small-scale modularisation [2, 38]. These asset-based consulting services can be combined to compose more sophisticated digital consulting solutions [34] or software-based solutions [31]. Asset-based consulting services promise cost reductions [32] and they help to distinguish from competitors [11].

Eleven of our 20 papers concern the topic of consulting platforms. Once standardised digital consulting services have been realised, new possibilities for automated [11] as well as algorithmic [17, 39] consulting approaches and their electronic provisioning [32] through digital IT consulting platforms [2, 17] will become more important. This will lead to a new optimised technology-augmented service portfolio and opportunities for cost savings and future growth [11]. As the authors of these 11 papers suggest, digital consulting platforms are expected to

open the floor for cost-efficient [32], flexible [32] and transparent [32, 35, 40] service realisations as they facilitate dynamic combinations of semi- or fully automated approaches [11], innovative forms of externalisation of service activities via self-service consulting to the clients [2, 11, 32], and reshaped customer interactions [11, 34]. Other authors indicate the potential of digital IT consulting platforms to streamline the collaboration of multiple actors who contribute to the service provisioning in the sense of crowd-based services [2, 11, 38, 39] and the mediation of resources like people and products [11]. Furthermore, the authors of four other papers [11, 17, 36, 37] emphasise the role of digital IT consulting platforms as the basis for mobile IT consulting scenarios.

One paper sets the focal point to the methodological perspective. It proposes to introduce the DevOps CAMS principles, which are culture, automation, measurement and sharing, in future consulting approaches [31]. As DevOps is based on the idea of establishing an automated delivery pipeline, based on integrated cloud platform services [31], we can see parallels to the aforementioned platform-based consulting.

4.2.10 | Future of digital consulting

In our MS, five of the 20 papers treat the design of digital IT consulting services and their future co-existence with 'classic' service portfolios. These papers state that digital consulting approaches are less likely to completely replace classic IT consulting approaches. Instead, these authors hypothesise that digital consulting would complement 'classic consulting' [11, 33, 38]. A possible reason for that is a lower attraction to clients in comparison to classic or traditional consulting [33]. But finally, it is the 'ultimate goal … to develop meaningful synergies between classic face-to-face consulting and digital technologies' ([11], p. 333). For example, as robo-advisors in the financial consulting domain, digital IT consulting services might also serve as the knowledge protecting barrier and hinder other consulting domains to enter the IT consulting domain market [41]. As pointed out by [37], the future of digital platform-based consulting will be a step-wise, evolutionary development that will affect different components of the business models of IT consulting companies.

4.3 | Findings pertaining to RQ3: areas for inclusion in the design of digital IT consulting services

Table 12 lists 14 areas that our selected sources deem important for IT consulting organisations to include in the design of digital current and future IT consulting fields. We see from Table 12 that data-analytics, IT security, and cloud technologies are the three most frequently mentioned areas.

Table 12 reports that the most frequently discussed area is 'data analytics' which relates to big data and data mining. In general, it is about data processing to provide data-driven IT consulting services [2, 11, 16, 22, 32, 34, 36, 37].

At the second position it follows the area of 'IT security' that relates to advisory services for software security, coping with cyber-threats, data-breaches, and systems hack avoidance. In addition to that, the training of IT consultants in IT security topics is also important. Such topics are related to advisory enablement, applying security concepts during software development, as well as strengthen the overall awareness [11, 16, 17, 22, 36].

At third position we find the area of 'cloud technologies'. Here we find concepts such as cloud computing, which provides 'scalable and elastic IT-enabled capabilities' [49] as services through the Internet. Further topics in this context are

TABLE 12 Identified areas for inclusion in digital IT consulting process designs

ID	IT consulting area	Publications	Publication
A01	Data analytics	7	[2, 11, 16, 22, 32, 34, 36]
A02	IT security	5	[11, 16, 17, 22, 36]
A03	Cloud technologies	4	[16, 17, 31, 36]
A04	Artificial Intelligence	3	[11, 38, 39]
A05	Internet of things	2	[16, 36]
A06	Business transformation	2	[16, 32]
A07	Product consulting	1	[32]
A08	IT transformation	1	[16]
A09	Data migration	1	[16]
A10	Digital transformation	1	[16]
A11	Robotic process automation	1	[16]
A12	Auditing consulting	1	[22]
A13	Process consulting	1	[32]
A14	Public administration consulting	1	[39]

the interconnection of different cloud-based platforms following a multi-cloud approach [16, 17, 31, 36].

Fourth, consulting in the area of 'Artificial Intelligence' seems to be a potential consulting field [11, 38, 39].

Fifth, we find the areas of 'Internet of Things' and 'Business Transformation' consulting. Consulting Internet of Things would cover, for example, cyber-physical systems and edge-computing related topics which are about connecting, for example, production machines or sensors to networks [16, 36]. Business transformation advisory covers topics such as how technology-based innovations could be applied to leverage opportunities which lay in digital business models [16, 32]. 'IT Transformation' and 'Digital Transformation' are the two other topics strongly related to business transformation. The first sets its focal point on already digitalised means, such as technical systems, and the latter covers the way from, for example, processes to their digital representations supported by technical systems.

Furthermore, 'Product Consulting' relates to advisory services in the context of specific (software-) products, such as SAP Enterprise Resource Planning. 'Data Migration' is related to advisory services on how to manage data transfers and transformation between technical systems which are required during system upgrades.

Next, 'Robotic Process Automation' relates to advisory services in automation of former manual tasks. Robotic Process Automation comes into play in cases when standard interfaces between systems exist but data within one system must be entered into another system to trigger certain action in the target system, for example, filling out an address form in an order system with information from an email.

Finally, 'Auditing Consulting' relates to advisory services for system security or fulfiling legal requirements. Such services provide information and guidance to prepare for an audit or to enhance system security. 'Process Consulting' relates to services to document, design, implement, and optimise business processes with the help of appropriate tools. A newer topic in this area is 'process mining' which is the reverse engineering of real process flows based on logging information, for example, collected from technical systems.

4.4 | Findings pertaining to RQ4: platforms

Even though it is possible to find many examples of digital platforms in other consulting domains, such as in professional consulting, which incorporates, for example, advisory services in health care, science, workforce and recruiting, or legal [19, 41], in our 20 selected papers, we found only three examples of dedicated digital IT consulting platforms (Table 13). However, the scope of application of these platforms remains unclear. There are no published empirical articles with examples of using these platforms in specific contexts. In turn, without knowing what works in a specific context, we could only speculate about the applicability of the platforms. This is an important gap of knowledge and to bridge it, more empirical industry–university research is needed. Only then, practitioners will know what works and in what settings, and researchers would know where to focus their research efforts, so that they come up with possibly solution ideas for practice.

TABLE 13 Identified examples for digital consulting platforms

Name	Status	Source
ARIS eConsulting store	Prototype	[32]
McKinsey solutions	Productive	[11, 38]
Bearing point asset-based consulting	Productive	[11]

Abbreviation: ARIS, Architektur integrierter Informationssysteme.

The 'Architektur integrierter Informationssysteme (ARIS) eConsulting Store' is an a fully integrated online shop that supports the selling and provisioning of digital consulting services to clients. The system is offered by the August-Wilhelm Scheer Institute for Digital Research [50].

McKinsey is a worldwide acting management and technology consulting organisation. They launched 'McKinsey Solutions' already in 2007, to provide their clients with software- and technology-based tools for self-service data analysis based on McKinsey's virtualised consulting expertise [9].

Bearing Point is a worldwide active management and technology consultancy. They offer asset-based consulting services to their clients, for example, through their proprietary ABACUS360 platform or analytics-as-service offerings related to predictive maintenance, risk management, or operational analytics [51].

4.5 | Findings pertaining to RQ5: approaches to conduct digitalisation of IT consulting

Our MS identified only one methodology that might support the digitalisation of IT consulting services. This approach is Overby's Process Virtualization Theory (PVT) [13, 48]. Following Overby, our society becomes increasingly virtualised [13]. That means that traditional and former physical activities are increasingly performed virtually. The term 'virtual' has the meaning of being *disconnected from the physical world*. An example of the traditional activity would be filling out a paper-based form using a pencil. A corresponding–but not the only possible–virtualised activity could be filling out a web-based digital (virtual) form using a computer. It is important to understand that virtualisation is not necessarily the same as digitalisation. A virtual representation would also be a printed sales catalogue instead of a store-based shopping experience [13]. From a digitalisation perspective, virtualisation therefore means to create digital, computer-based representations of physical mechanisms [13]. This goes with the necessity of digitality, which requires corresponding cyber-physical interfaces and sensors for human–machine interaction. The PVT is rather general and was not designed for digitalising IT consulting services. Anyhow, the PVC provides interesting insights into the context of transforming physical mechanisms

to digital representations. The dependent variable is the 'process virtualizability' that relates to the possibility of how good a certain process can be 'conducted without physical interaction between people or people and objects' ([13], p. 279). In our opinion, more dedicated research is necessary to better understand its usability for IT consulting.

Helmer et al. propose another methodology that aims more on innovation of services instead on digitalisation of services, but we mention it for completeness: the 'Digital Innovation Process for Services' [21]. The authors identified and analysed 25 innovation process conceptualisations. The authors structured these concepts based on their foci: 'iterative element', 'digital focus', 'product focus', and 'service focus'. 16 of 25 concepts set their focal points on services and only two concepts of this subset especially also took a digital perspective. Seven of the 16 service-focussed concepts also contained an iterative element. The other concepts had a product focus. Simplified, their model represents a synthesis of all 25 identified concepts and has a three-level structure. The first level contains 6 clusters of an innovation process: 'opportunity identification', 'ideation and idea management', 'concept development', 'service development', 'testing & validation', and 'launch'. The second level contains 19 specific activities which are then more detailed at the third level. The presented approach cannot be used to digitalise services, but it might be applicable during creation of new digital services.

5 | DISCUSSION AND IMPLICATIONS

5.1 | Discussion on our results

In this section, we reflect on our findings presented earlier. First, regarding the concepts and synonyms (Table 11) referring to the phenomenon of digitalisation of IT consulting services, our MS signals a broad variation in ways in which research schools think and reason about our phenomenon of interest. While this is natural for multi-disciplinary research areas, it is important to make steps towards reducing terminological confusion and to explore more in depth the meanings that the research communities consider when using each term. This is a necessary line of research for the future. For this reason, we provided a new definition of digital IT consulting services (see Section 4.1).

Second, looking at the distributions of relevance levels calculated based on our first review results and the rank of each theme cluster (see the rank at the bottom of Table 10), we observe that TC06 'Prerequisites to Digitalisation of Consulting' is the most present theme. It is at rank 1. This shows that the identification of the necessary requirements–both business and technical–preoccupied researchers in their studies. We were surprised, however, that no paper treated this deeper, for example, stakeholders' analyses or discussions on non-functional requirements were missing. Clearly, as the IT consulting organisations need to adapt to the requirements induced by digitalisation, they also need to document them and analyse them first. We therefore hypothesise that future research will be more empirical in nature and will include applications of requirements in engineering techniques to digital transformation projects in IT consulting companies. A deeper understanding of the stakeholders and their unique goals and requirements would be of great value.

The second most common topic is 'Why digitise IT consulting?', in which arguments for digitisation are collected. It is understandable that reasons of efficiency in particular play a role in the decision to digitalise IT consulting services. However, flexibility gains, orchestration of players such as consultants and customers, and the opening of new customer segments are also relevant.

Furthermore, the third most present topic in Table 10 is TC09 'Forms of Digital Consulting'. We identified that asset-based consulting in combination with electronic provisioning through digital consulting platforms is a topic of research interest. We observed that the questions regarding the platform standardisation and modularisation are of particular interest. Moreover, even if platforms are standardised, customisation of services seems to remain important.

Fourth, we found that only a limited number of scientific artefacts of digital IT consulting exist. Those reported in Section 4.4 should therefore be considered only as examples without assuming completeness. It is plausible to expect more artefacts in the future, in line with the assumption for growing demand today due to the Covid-19 pandemics.

Fifth, we found that the most frequently mentioned area for inclusion in the design of digital IT consulting services is data analytics (Table 12). In our view, this is unsurprising as data-science-based approaches are adopted increasingly more in many organisations.

Sixth, our findings only confirm what practitioners signal in industry, namely that no standardised way currently exists to describe digital IT consulting services. This also means that digital consulting platforms are not able to provide those digital IT consulting services in a standardised way. This is problematic as digital consulting platforms are considered to have positive effects on cost-efficiency, transparency, and automation of IT consulting services. Confronting this situation opens opportunities for industry-relevant research towards establishing standards and service description approaches that are grounded on standards.

Finally, we compare and contrast our findings to those published in the literature reviews [2, 19, 21, 22] included in Section 2.2. First, our findings agree with Greeff et al. [2] regarding the importance of digital business models. In fact, 11 of our 20 selected papers point to this. We also make the note that many of these 11 papers have been recently published (in 2020 and 2021). Considering this, our results add up to the body of evidence that has already been produced by Greff et al. and expand these authors' results in at least two ways: first, our findings point out that cost-effectiveness and accessibility are important properties of the digital business models if these are to be adopted and add value in IT consulting. Second, our results revealed important implications, for example, change of whole value chains and necessity to redesign existing processes such as billing.

Furthermore, we compared our 14 areas for inclusion in the design of digital IT consulting services (Table 12, Section 4.3) with the eight 'focal areas' of IT consulting found in the review of Kumar et al. [22]. We found that our results agree with those of Kumar et al., regarding the area of IT security only. In fact, Table 12 shows this area as the second most frequently mentioned in our set of 20 selected papers. However, regarding the other seven 'focal areas' of IT consulting found by Kumar et al. (namely, IT training, auditing, project management, knowledge transfer, IT economics, competitiveness, and applications), we note that our findings do not overlap. Tables 12 and 13 contain new knowledge which our MS contributes to the body of knowledge built onthe work of other authors (i.e., Kumar et al.).

Regarding the reviews of Helmer et al. [21] and Cerruti et al. [20], we think that our findings complement the previously published ones, as we zoomed in on the IT consulting, and contributed concepts characterising the DT phenomenon from a multitude of new perspectives. In this sense, our findings are much more fine-grained as they provide evidence about state-of-the-art knowledge on approaches, platforms, tools, and specific implementational scenarios. Unlike the previously published works that focussed on management consulting, here we revealed the specific characteristics pertaining to the digitalisation of IT consulting services, which could possibly inform future research initiatives aimed at exploring the requirements for tools and platforms from the perspectives of the those in the field (namely IT consultants).

5.2 | Reflection on implications

Our MS has some implications for both practice and research. These are presented in the next sub-sections.

5.2.1 | Implications for IT consulting practitioners

There are four practical implications of this MS for IT consulting practitioners, involved in provisioning of IT consulting services. For clarity, we listed them in Table 14. We note that we deliberately formulated them as actionable statements and take-away messages for practitioners (see the second column in Table 14). Perhaps, the most important is 'Start small, think big' (IP1) in the current pandemic situation. This is because for IT consulting companies to embark on the digital transformation, they first need to start collecting examples of digital consulting services that worked. Our MS provides such examples. We think these examples are important particularly in the time of the current Covid-19 situation. As digital transformation market observers indicate [52], the

TABLE 14 Implications for practice

ID	Implication	Description
IP1	Start small, think big	Due to existing uncertainty, requirements arising from the current Covid-19 pandemic, and the lack of productive examples, IT consulting organisations should start with their digitalisation journey soon to gain experience. Develop first digital IT consulting artefacts, deploy them and gain experience from them. Build on these learnings.For example, start by introducing virtualised, web-based questionnaires to collect service provision-related preparational data from your clients, instead of collecting them in workshops only (see Section 4.2.7).
IP2	Become a digital organisation	Those IT consulting organisations engaged in rethinking their strategy, might find it useful to consider at least hybrid business models combining classic and digital IT consulting services. As our results pointed out, digital consulting would most likely co-exist with 'classic consulting'. Deploy digital IT consulting services and make sure your staff develops a new digital skill set. Learn how your customers accept these new digital offerings and interactions. This will be a first step to fully digitalised business models (see Sections 4.2.2, 4.2.3 and 4.2.6). Think about new services from the digital perspective first. For example, try to provide every project to be conducted with a defined set of digital tools and templates (e.g., file storage, ticketing tool, version control systems, etc.) which then become standard for your organisation (see Section 4.2.8).
IP3	Respect new generation actors	IT consulting firms rely strongly on IT experts if they are to digitalise their business models. It might well be possible that the new generation of IT experts providing IT consulting services and their clients have new or different requirements. These requirements must be identified and considered in the digital transformation of the provisioning process of services. For example, provide these stakeholders with the technologies and tools they expect, and don't stay one step behind what, for example, your consultants are already using privately, or your customers are already using for business (see Section 4.2.6).
IP4	Develop a future-proof IT consulting skill set	IT consulting companies that embrace digital transformation should make sure that their IT consultants continuously keep their necessary technical knowledge up to date, because the technical development is progressing rapidly. Prepare your organisation to enable continuous learning. Identify trends and technologies early on and understand your customers' requirements. Then it is possible to derive training and learning strategies accordingly. Provide evidence of this knowledge by encouraging your employees to obtain certifications (see Section 4.2.6).

pandemic situation is an ideal opportunity for any IT consulting organisation to start small in building positive experiences in digitalisation.

5.2.2 | Implications for research

There are six implications we see for scholars in Information Systems Research, Computer Science, and Consulting Research. These are listed in Table 15. Therein, we present the research gaps that we found and the relevant RQ that we propose in respect to each gap. We also indicate what steps to take to do the future research. In our opinion, the most important research gaps are the identification, the development, and the operationalisation of digital IT consulting business models (see IR1, in Table 15) together with the development of scientific artefacts in digital IT consulting (IR2) and the technical means to describe these artefacts (IR5).

TABLE 15 Implications for research

ID	Research gap	Relevant research questions and research steps for the future
IR1	Digital IT consulting business models, their operationalisations and stakeholders' requirements	What alternative digital IT consulting models are technically implementable and are cost-effective? What are the stakeholders' requirements for the support systems implementing the new business models? What technological solutions meet these requirements? What non-functional requirements are most important? These questions are empirical in nature; therefore, we think that researchers should try to answer them by using empirical research methods and in collaboration with IT consulting companies, for example, to jointly develop and evaluate digital IT consulting business models.
IR2	Design and empirical evaluation of scientific artefacts	To be able to draw evidence-based conclusions about characteristics of the digital transformation phenomenon in the provisioning of IT consulting services, scholars need more examples of digital IT consulting artefacts, such as digital IT consulting platforms and digital IT consulting assets that we can learn from. Designs of such artefacts need to undergo empirical evaluation for usefulness and utility. As in IR1, this research would benefit from doing empirical studies with IT consultancies and client companies to design and evaluate jointly digital IT consulting artefacts, such as platforms to provide digital IT consulting services.
IR3	Cross-organisational requirements for digital IT consulting services and their supporting infrastructure	Building upon IR2, we call for more research on the design of digital IT consulting services. How have these services to be structured? What are the requirements of consultants and clients? How can participating actors be efficiently organised and orchestrated? How can the digital service provisioning be monitored to gain insights?
IR4	Ontological and methodological foundation and standardisation	We call for research on methodological approaches to support the digitalisation of consulting services. Additionally, our results indicated many concepts being used today do describe digital (IT) consulting. Therefore, as part of making proposals for methodological approaches, scholars and practitioners should try to come to a standardised wording.
IR5	Description of digital consulting assets	We see that research needs to support practitioners and scholars related to the definition and description of digital IT consulting assets. We argue that this is the required foundation for advisory through digital consulting platforms. Currently we find only proprietary services/ platforms and no standards for the definition and notation of digital IT consulting assets (see Sections 4.4 and 5.1). Design and evaluate notations and languages to describe IT consulting services so that these descriptions can be interpreted by digital IT consulting platforms. Interpretation means to create new digital IT consulting service instances and manage their life cycle.
IR6	Requirements of 'next generation actors'	What goals, needs, and expectations do 'next generation' consultants and clients have regarding digital provisioning of IT consulting services? What requirements call for adaption of existing platforms supporting digital business models? What evolutionary scenarios should be considered for existing platform components and digital IT consulting services to match the requirements of the 'next generation actors'? To identify these requirements, we think it would be beneficial to conduct qualitative research with IT consulting clients and practitioners by presenting examples of digital IT consulting artefacts.

If research efforts make progress in these areas, we then consider research on the cross-organisational requirements for digital IT consulting services and their support infrastructure (IR3) as a logical follow-up on IR1 and IR2. Once digital business models, examples of working artefacts, and empirical evaluation of proposed digital consulting service designs are available, further research efforts seem logical to focus on the ontological foundation for standardisation (IR4) related to approaches to support Information Systems and Consulting Research scholars as well as IT practitioners. Finally, more research efforts should be focussed on the requirements of 'new generation actors' (IR6). This implication is important, especially from the perspective of the current pandemic situation.

6 | LIMITATIONS

This work has some limitations. Here, we examine them, drawing on the work of Zhou et al. [53]. These authors categorise the threats to the validity of SLRs in software engineering in terms of internal, construct, external, and conclusion validity. We reflect on these threats and the actions we took to counter them during our research process.

Internal validity: This category refers to the rigour with which we implemented our research process. As already indicated, we devised our process implementing practices from three methodological sources [25, 29, 44]. We are conscious about the fact that every search string used for querying digital libraries has its limitations, which in turn means a possibility to leave unhit a potentially relevant paper [29]. To mitigate this threat, we first made a list of relevant terms based on our careful examination terminology used by other authors (i.e., [15]) and then we experimented with 24 search strings, to assure maximal coverage. We therefore think that the risk of missing a potentially relevant paper is reduced significantly. Furthermore, we paid particular attention to our search queries, as we were conscious of the use of synonymous terminology in our field of interest (i.e., digital transformation). This brought us to the decision to experiment with a broad range of strings (Table 3), which strengthened our confidence in the final query used in the remaining part of the process.. Third, we chose to limit our search for sources from January 2017 to end of 2021. This might lead to potentially missing out articles that were published earlier and that might be related to our topic of research. However, as we included four SLRs [2, 19, 21, 22] and one overview article on future trends in IT consulting [17] in our paper, we think that this limitation is partially mitigated.

Construct validity: This category is concerned with our decisions on the digital libraries to use, the criteria for inclusion and exclusion of primary studies, the RQ, and the selection of the primary studies themselves. We used Scopus as the only database for our search. This could be a threat related to possible search results, which might not be indexed at Scopus and therefore would be missed out. We, however, consider this risk minimal as bibliographic research [27, 28] ascribes Scopus comprehensiveness. Furthermore, we chose to focus on a digital library of scientific literature, while it might possibly be the case that industry reports that are unavailable in scientific libraries, offer in fact valuable insights into industrial practices regarding digital transformation of IT consulting services. This is a limitation of any study on a topic that is highly industry relevant. We acknowledge that a possible way around this limitation might be to include the so-called 'grey literature' [54, 55] to our review. However, in our work, we made it a priority to include peer-reviewed sources only, which in turn means sources that meet certain basic quality criteria (e.g., being either empirical studies or secondary sources). Finally, regarding on the choice of inclusion and exclusion criteria, our decisions followed the guidelines of [29]. The three authors worked together to establish alignment between the RQs and the inclusion and exclusion criteria and piloted them to check their applicability. As there was no change in the list of designed criteria, the results of this pilot (i.e., the papers selected) were considered part of the overall MS process. Finally, we were aware of the possibility of bias that each of us might pass into their selection of papers for inclusion. For example, this would be the case if the authors doing the MS are engaged in research collaborations with authors of the primary studies included in their review. We, however, think that this threat is kept to minimum because none of the authors of the included papers is known to us in person. Also, the three authors have no prior publications in the journals and the conference proceedings in which our selected papers were published. This makes us believe that our selection is as bias-free as possible.

Conclusion validity. This category refers to the interpretation of the information in the selected papers. As indicated earlier, the methodological guidelines of [44] inspired us to choose coding as our data analysis strategy. We implemented the three cycles of coding according to the guide of [43], whereby one author was fully engaged in the coding identification process and two authors in the review and the arrangement of codes in higher level categories. We think that the risk of misinterpreting an aspect of digital transformation phenomenon is relatively low, because the researcher doing the coding had worked as a practitioner in this field in various consulting assignments in the technical implementation of DT in multiple business sectors. In addition, the second researcher also had exposure to IT consulting as he worked in industry prior to her academic career. Finally, the total number of our selected papers was 20. If the number would be in the range of hundreds, this would have increased the chance for the coder and the reviewers to get tired and possibly lead to misinterpretations.

External validity: This category of validity threats concerns accessibility of studies. We make note that all our 20 selected papers are downloadable in Scopus and made available to other researchers. As indicated in the previous paragraph, we deliberately decided to not consider 'grey' literature, a decision also motivated by the fact that industry reports are not always available to researchers unless expensive subscription fees to industry databases (e.g., Gartner and Forrester).

7 | CONCLUSIONS

This paper analysed the characterising aspects of the digitalisation of IT consulting service provisioning by using Kitchenham's guidelines for reviewing literature. Based on 20 publications, we found answers to five RQs. These are summarised as follows.

7.1 | RQ1: What concepts are used as synonyms in published literature to mean the digitalisation of IT consulting?

We have identified 10 terms used by the authors as synonyms for the digitisation of IT consulting services (Table 11). While some concepts could be connected intuitively to the phenomenon of digital transformation (e.g., self-consulting and self-service consulting), others seem less so (e.g., algorithmic consulting).

We proposed a new definition of the term 'digital IT consulting service' as contribution to academia and practice (see Section 4.1) to help harmonising the terminology used to today.

7.2 | RQ2: What are the themes treated in the literature on digitalisation of IT consulting?

Our analysis revealed 10 themes (Table 10). These are: 'Contextual Factors of Digital Consulting', 'IT Consulting Market Change Scenarios', 'Why digitalise IT Consulting?', 'Why not digitalise IT Consulting?', 'Digital Business Models', 'Prerequisites for Digitalisation', 'How to digitalise IT Consulting?', 'Execution Examples of Digital Consulting', 'Forms of Digital Consulting', and 'Future of Digital Consulting'. We observe that eight of these themes are primarily concerned with business issues and two themes treat explicitly technology issues.

7.3 | RQ3: What areas for future IT consulting are reported in the published literature?

Table 12 lists 14 areas that our results indicate as candidates to consider for inclusion in the design of digital IT consulting service provisioning. Among those 14, data-analytics, IT security and cloud technologies are the three most frequently mentioned areas.

7.4 | RQ4: What are the applications of digital IT consulting in the published literature?

We found three digital consulting platforms dedicated to IT consulting: ARIS eConsulting Store, McKinsey Solutions and Bearing Point Asset-Based Consulting. The scarcity of examples of the platforms in scientific literature might well be traceable to their proprietary nature.

7.5 | RQ5: Which approaches to conduct the digitalisation of IT consulting are reported in the published literature?

Our MS identified only one methodology to conduct digitalisation of IT consulting services. This approach is Overby's PVT [13, 48]. The approach is rather general and was not designed for the purpose in question. In our opinion, more dedicated research is necessary to better understand its usability for IT consulting. We added the *Digital Innovation Process for Services* [21] for completeness but indicate that this method deals with digital IT consulting service creation and does not support the digitalisation of existing IT consulting services.

8 | FUTURE WORK

This MS has been a first phase towards a multi-year research project in which we aim at developing a modelling language for specifying IT consulting services and a prototype platform for providing IT consulting services. Our immediate next step is to plan and carry an exploratory interview-based case study with practitioners in various IT consulting companies to uncover the state-of-the-art practices in digital transformation for IT consulting. This would help us to understand better the gap between what happens in practice and what is reported in scientific publications. Based on this knowledge of the gaps, as a follow-up step, we plan to set up a case study aimed at identifying the business and technical requirements that IT consultants have for the digitalisation of IT consulting services.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions.

ORCID

Meikel Bode https://orcid.org/0000-0001-7156-6851
Maya Daneva https://orcid.org/0000-0001-7359-8013
Marten J. van Sinderen https://orcid.org/0000-0001-7118-1353

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