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Conceptualizing organizational culture and business-IT alignment: a systematic literature review

Marcel R. Sieber[1] · **Milan Malý[2]** · **Radek Liška[2]**

Abstract

For decades, business and information technology alignment has fascinated scholars and practitioners. However, understanding these alignment mechanisms is challenging. The significant role of information technology (IT) in digitalization and agile transformation calls for targeted management of the readiness and capability of IT as an enabler and strategic business partner. This paper assumes that organizational culture is a success factor for business-IT alignment. Therefore, it aims to explore the culture-alignment relationship by the following research questions: What are typical IT management organizational culture characteristics, and how do they contribute to business-IT alignment? The study conducts a systematic literature review. First, after defining the critical terms, it searches the databases indexed in the Web of Science, Scopus, and Google Scholar. Then, the study uses bibliometrics to get quantitative insights into the research topic. Finally, it investigates the key arguments and findings of the selected papers. The analyzed literature depicts the relationship between an IT management culture and business-IT alignment elements. However, the research lacks concrete modeling and conception. This article contributes to a better culture-alignment relationship interpretation and closes a gap in the body of knowledge by combining quantitative and qualitative literature review methods.

Keywords Organizational culture · IT management · Business-IT alignment · Literature review · Bibliometrics

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Introduction

The growing economic importance of information technology (IT) leads to an *increased significance of the alignment of business and IT* (Chan and Reich 2007, p. 298; Hiekkanen et al. 2015; Jonathan 2018; Kappelman et al. 2013; Luftman and Brier 1999). Especially when industries and businesses encounter agile and digital transformation challenges, IT departments and their alignment to the business play a crucial role (Gajardo and Ariel 2019). Furthermore, IT supports the business in realizing digitalization opportunities as a provider of dedicated digital infrastructure, products, services, and solutions (Kahre et al. 2017).

Although regularly on top of the practitioners' and scientists' agendas, business-IT alignment remains challenging (Jonathan and Hailemariam 2020; Luftman et al. 2013, p. 357). *Business and IT need a mutual understanding*, strategically aligned as one, founded on IT governance (Chew and Gottschalk 2013, pp. 186–190). As part of corporate governance, IT governance ensures that IT supports and enlarges the organizations' strategies and objectives, including the alignment of IT to realize business gains (IT Governance Institute 2003, pp. 10–11). It also helps prioritize and allocate the needed resources (Luftman and Brier 1999, p. 119). However, traditionally, IT primarily remains in a strategically executive role, functional and essentially subordinate to the business (Hiekkanen et al. 2012, Kahre et al. 2017, p. 4706). This perspective roots in the senior executives' perceptions of IT as a cost factor in a historical context because it has not achieved the expected competitive advantage in the 1980s and 1990s (Chew and Gottschalk 2013, p. 327; Peppard and Ward 1999, p. 32). Practitioners regularly report shortcomings of IT realizations in time, cost, and quality; this is mainly an issue of the critical relationship between cost-efficiency and effectiveness, including the role of IT strategy and culture (Aitken 2003). Critics about a hindering IT culture because of its stability and security tendencies call for entrepreneurial, or at least commercial behaviors in IT functions, welcoming change and risks (Aitken 2003).

Many organizations still struggle with the *cultural separation of IT and business*, which results in a "us" vs. "them" and a lack of synchronized governance of decisions and strategies (Chew and Gottschalk 2013, p. 186; Mithas and McFarlan 2017, p. 6). As a result, the relationship between business and IT remains potentially conflictual (Leidner and Kayworth 2006). Besides the biased attitude towards IT, such conflicts concern the user groups of information systems and their often contradictory vision (Leidner and Kayworth 2006, pp. 374–375). Although they found only a few studies about the managerial's role, Leidner and Kayworth (2006, p. 380) proposed that managers could reduce conflicts by shaping and promoting shared values in business and IT. Such values would be part of a shared organizational culture, fostering the relationship between business and IT. However, the business-IT partnership also depends on the IT department's business orientation, managerial knowledge, and perceived IT value. Accordingly, although to a relatively small magnitude, a significantly technology-oriented IT negatively impacts the relationship between

business and IT (Manfreda and Indihar Štemberger 2019, p. 962). These findings are consistent with the research of 20 years ago, where the examined organizations' IT management acknowledged that they need to increase their business knowledge (Peppard and Ward 1999, p. 50).

Before this background, this paper aims to explore the influence of organizational culture on business-IT alignment, i.e., if particular organizational culture dimensions help IT management leaders or teams suitably align to the business. It investigates the following research questions:

1. What are the information technology management's typical organizational culture characteristics?
2. How do these characteristics contribute to the alignment of business and information technology?

Therefore, it employs a systematic literature review and follows a hybrid approach by integrating a bibliometric and structured review (Paul and Criado 2020, p. 2). As a result, the study presents a comprehensive and extended overview of the knowledge base about the relationship between organizational culture and business-IT alignment. Furthermore, it discusses the implications of research strategies, bibliometric analyses, and qualitative aspects of the literature review in this paper.

Outline

The remainder of the paper starts with the theoretical background and then explains the methodology, including the search procedure and strategy, bibliometrics, and paper selection. Then follow the results with quantitative and qualitative analyses of the references, which reflect the relevance and relation of the critical research topics and the studies relating to this paper's research questions. After the discussion of the results with summarizing them before the theoretical background, the paper finally closes in the conclusions by considering this paper's contributions and limitations and answering the research questions.

Theoretical background

The concept of *alignment* is only vaguely defined (Hiekkanen et al. 2012, p. 219). This study takes a decent strategic management point of view. From this perspective, the common goal to deliver the best value and service to the information system's user denotes the relationship between business and IT strategy (Buchta et al. 2010). Different models and frameworks for business-IT alignment exist in the literature (El-Mekawy 2016). The strategic alignment model (SAM) of Henderson and Venkatraman (1993) and the strategic alignment maturity model (SAMM), published by Luftman (2000), are probably the most cited and widely used works. This paper relies on Henderson and Venkatraman's (1993, p. 472) model and its *definition of business-IT alignment* as "four fundamental domains of strategic choice: business strategy, information technology strategy, organizational infrastructure and
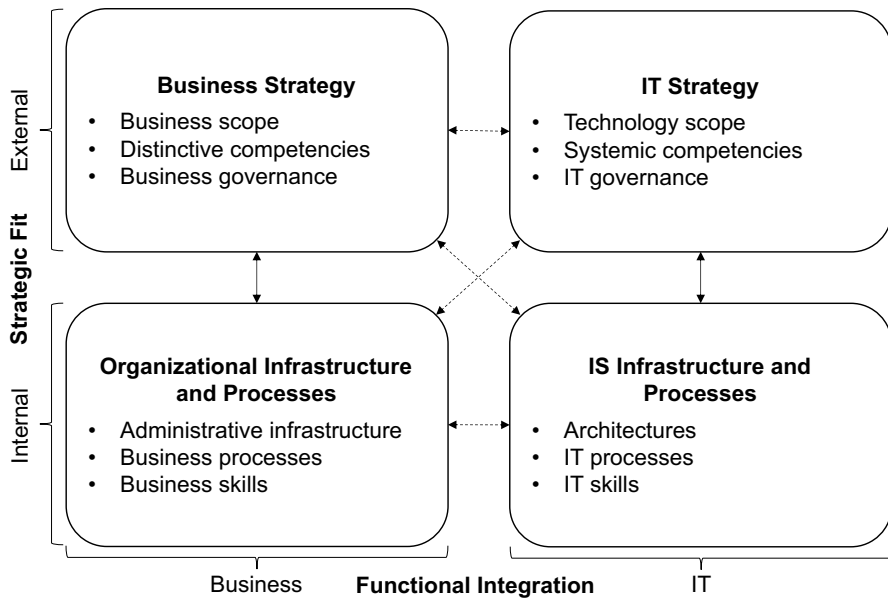
Fig. 1 Strategic alignment model (adapted from Henderson and Venkatraman 1993)

processes, and information technology infrastructure and processes," see Fig. 1. Along with these traits, business and IT align in a mutual "process of continuous adaptation and change" (Henderson and Venkatraman 1993, p. 473).

The SAMM focuses on maturity levels, measured by six criteria (Luftman 2000, p. 10): Communications, competency/value, governance, partnership, scope & architecture, and skills. The last criterium contains an organization's cultural and social environment (Luftman 2000, p. 20). This overlapping with organizational culture is the most important reason not to include the SAMM in this paper's analyses.

Organizational culture is multi-faceted, and no widely shared definition exists. Table 1 provides a brief classification of organizational culture perspectives. The first authors emphasize culture as a *variable* or out of a *functional view* (Baetge et al. 2007, p. 186). They argue that an organization *has* a specific culture that can be managed, measured, and compared. The second group of scholars states that an organization *is* a culture, with its uniqueness and perceptions of practices (Hofstede et al.), values (Sagiv et al.), and underlying assumptions (Schein). These perspectives are more subjective than the above noted; they are harder to compare. The third theory evolved as a *combination* of those mentioned above and questions the deterministic, taken-for-granted, and simply assessable view of organizational culture (Alvesson 2013, pp. 31–32). Alvessonn (2013, p. 65) advises studying the specific cultural manifestations and their consequences rather than the entire corporate culture and its impact on organizational performance.

This paper takes a *functional perspective* and focuses on culture as "the norms and values that guide behavior within organizations" (Chatman and O'Reilly 2016, p. 218). Culture is responsible for adapting organizations to their societal

Table 1 Organizational culture perspectives (adapted from Sackmann 2011, pp. 36–42)

Perspective	Model	Purpose	Reference
1. Culture *as* a variable: Company *has* a culture	Competing Values Framework	Diagnosing and changing organizational culture	Cameron and Quinn (2011)
	Four categorical corporate culture types	Distinguish different corporate cultures on a national level	Trompenaars and Turner (2015)
	Organizational Culture Profiles	Examine the fit of individuals and culture for effectivity	Wallach (1983)
2. Culture as a metaphor: Company *is* a culture	Cultural dynamics model	Manifestation, realization, symbolization, and interpretation determine culture	Hatch and Cunliffe (2013)
	The balance of values and practices	Shared perceptions of practices are an organization's cultural core	Hofstede et al. (2010)
	Schwartz Value Framework	Organizational value perceptions align with national cultural orientations	Sagiv et al. (2011)
	The levels of culture and their interaction	Underlying assumptions determine values and behavior and lead to visible artifacts	Schein (1984)
3. Culture as a dynamic construct: Company *has* and *is* a culture	Framework for thinking culturally about management and organizations	Metaphors to understand organizations as cultures	Smircich (1983), Alvesson (2011); Alvesson (2013)

and economic environment, and it integrates structures and processes for the alignment of conjoint activities (Herget and Strobl 2018, p. 6). That functional view also holds Cameron and Quinn's (2011, p. 168) Competing Values Framework (CVF). It emphasizes culture as a variable that can be managed and measured at the corporate level. This paper *defines organizational culture* before the background of the CVF as "a potential predictor of other organizational outcomes (such as effectiveness)," which "includes core values and consensual interpretations about how things are" (Cameron and Quinn 2011, p. 169).

Figure 2 depicts the framework with its four quadrants and characteristics. It spans two dimensions: the y-axis contrasts effectiveness between *flexibility/freedom to act* and *stability* vs. *control*, the x-axis *internal focus and integration*, and *external focus and differentiation*. The dimensions' properties result in the four ideal-typical quadrants *Clan*, *Adhocracy*, *Market*, and *Hierarchy*.

Prior research shows an influence of business-IT alignment on various outcomes, such as *competitive advantage* (Kearns and Lederer 2003), *business/organizational performance* (Chan and Reich 2007, p. 298; Charoensuk et al. 2014; Hiekkanen et al. 2012; Kahre et al. 2017, p. 4707), *process performance* (Cleven 2011); *organizational agility* (Koçu 2018; Lemrabet et al. 2011), *organizational change* (Wattel 2012), and *information security* (El Mekawy et al. 2014).

However, there is a shortcoming of studies about the relationship between organizational culture and business-IT alignment (El-Mekawy et al. 2016); culture is just one among other factors of business-IT alignment (Hiekkanen et al. 2012, p. 221). We know a lot about organizational culture and *effectiveness* (Denison and Mishra 1995; Hartnell et al. 2011; Quinn and Rohrbaugh 1983; Wallach 1983), *performance*
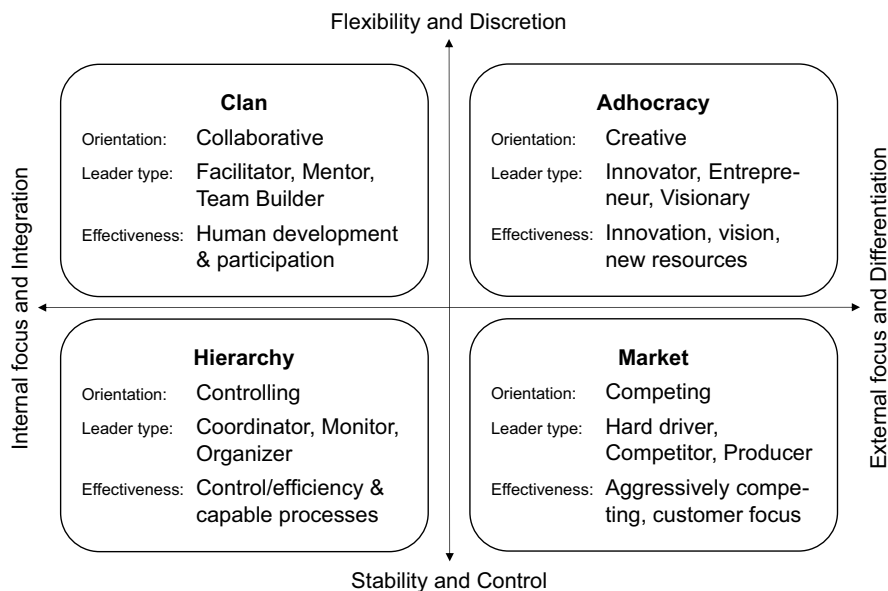
Fig. 2 Competing values framework (adapted from Cameron and Quinn (2011, p.53))

(Dasgupta 2014; Deshpandé and Farley 2004; Henri 2006; Heskett 2012; Kotter and Heskett 1992; Wilkins and Ouchi 1983), and *(organizational) agility* (Felipe et al. 2017; Iivari and Iivari 2011; Ravichandran 2018; Sambamurthy et al. 2003; Tallon et al. 2019) but not in direct relation to business-IT alignment.

Methodology

This study conducted a systematic literature review. As a guideline and intention to structure the review procedure, the paper applied the *Preferred reporting items for systematic reviews and meta-analyses* (PRISMA) statement (Moher et al. 2009; Jackson et al. 2015, p. 41). That framework helps scholars improve the review's reporting and consists of a checklist with different items, which reflect the iterative process of reviews, and a proposed flow diagram for screening and selecting the literature (Moher et al. 2009, pp. 5–6; 8).

The paper followed a hybrid approach, as described in (Paul and Criado 2020, p. 2). After a domain-based systematic literature search, it conducted a bibliometric analysis with the found references and selected the full-text articles and conference papers. Finally, the analysis structured and discussed the selected studies' contributions to the body of knowledge.

Search procedure

Table 2 summarizes the approach for getting the relevant search terms. The main aspects in column one reflect the keywords regarding the research questions. For example, the terms *IT*, short for *information technology*, and different business and IT alignment writings, such as *business-IT* or *IT-business alignment*– with or without the hyphen–, *company alignment*, or just *alignment*, are challenging.

Columns two and three of Table 2 present the binding and related terms, i.e., synonyms, derived from the key terms. Bold terms or parts of the terms indicate possible truncations for the search procedure to find words with different typings, such as *organization, organizational,* the British *organisation, organisational,* and the German *Organisation,* or *Organisations-*. Emphasized words with an asterisk are terms out of the scope of this literature review. This study followed a strategic

Table 2 Related terms for the investigation of the research questions

Main aspects	Terms	Related terms
Organizational culture	• **Organi**zation	**Corpor**ation, **compan**y, **enterpr**ise, **firm**, **business**
	• **Culture**	Behavior, *identity*[*], *climate* [*]
Information technology (IT)	• **Informati**on	*Data*[*], *data science* [*]
	• **Communi**cation	N/A
	• **Techn**ology	Technique, **system**s, *operations* [*]
Strategic alignment	• **Strateg**ic	Strategy, business, company, organization, enterprise
	• **Align**ment	Align, alignment *maturity*[*]

Note. Indicated truncations of the search terms are bold. [*] For complexity reasons, terms with an asterisk and emphasized are out of the scope of the literature review

and socio-institutional organizational culture and business-IT alignment approach. This institutional perspective excluded psychological concepts such as *identity* and *climate* or operational and process concepts such as *operations* and *maturity*. Also out of scope were emerging investigations relating to *data* and *data science* as special information systems topics.

The research strategy considered databases of the Clarivate Analytics' Web of Science (WoS), Elsevier's Scopus, and Google Scholar, as, for example, Yang and Meho (2007, p. 12) and Paul and Criado (2020, p. 3) recommend. The search procedure from May 2022 needed appropriate adaptation since these providers use different forms, syntaxes, and filters.

For the *Web of Science*, this study applied the following steps:

1. Select the suitable indexes,
2. Use the search field *Topic,* which searches the *documents' title*, *abstracts*, *author keywords*, and *Keywords Plus*, i.e., the keywords attributed automatically by the indexing database,
3. Apply truncations, for example, *organi?ati**, *corpor**, or *enterpr**, and connect the terms by the boolean operator OR,
4. Use the particular operator NEAR/50 with *culture,* truncated as **ultur**, which enables the finding of, for example, *organizational* and *culture* within a distance of 50 words,
5. Add rows with the boolean AND and the terms of the other main aspects of Table 2,
6. Add rows with the boolean *NOT* with all *terms out of the scope* of the research field,
7. Search and refine the results by the document types articles, conference papers, books, book chapters (if apparent), and Web of Science categories.

For *Scopus*, the steps were similar:

1. Search within *article title*, *abstract*, and *keywords*,
2. Connect the truncated terms with OR and *culture* with W/50, similar to the Web of Science operator NEAR/50,
3. Add main aspect terms with AND,
4. *Exclude* terms out of focus with *AND NOT*,
5. *Exclude* subject areas irrelevant to the research field, such as *Arts and Humanities*, *Environmental Science*, *Mathematics*, or *Medicine*,
6. *Limit to* document type, i.e., article, conference paper, book chapter, and book,
7. *Exclude* most apparent keywords not relevant to the search terms, such as *Knowledge Management*, *Societies and Institutions*, *Project Management*, *Marketing*, *Personnel*, or *Human Resource Management*.

Since *Google Scholar* is less standardized than Web of Science and Scopus, the search procedure differs. A similar search strategy in Google Scholar would have given too many results. Therefore, we used the exact terms, such as *organizational*

culture or *corporate culture* and *business-IT alignment*. The results must be sorted by relevance, and the box named "include citations" unticked. Finally, it tooks a manual effort by ticking the star to include the references with the terms in the title and description in the personal library.

This review protocol aligns with Moher et al. (2009) checklist items five and eight. Appendix A of the supplementary material summarizes and refers to the checklist's items in this study, Appendix B depicts the review protocol with further details of the search procedure.

Bibliometric analysis

Bibliometrics helps the researcher quantitatively overview the publications' citation trends and the state-of-the-art of a research field or topic (Paul and Criado 2020, p. 2; Aria et al. 2020, p. 805). By using statistical tools, bibliometric analysis knows mainly two branches. First, the bibliometric *performance analysis* measures scholars' publication activity and productivity over time and how often they get cited (Aria et al. 2020, p. 805). Second, the *science mapping* analyzes and visualizes a specific domain's structural and knowledge linkages (Aria et al. 2020, p. 806). In order to answer the research questions, we focused on the aforementioned second purpose of bibliometrics.

For this purpose, we applied the regularly updated R-package *bibliometrix*, explained and maintained by Aria and Cuccurullo (2017), who propose a science mapping workflow. For bibliometric analysis, other software tools are available, such as CitNetExplorer (van and Waltman 2014), HistCite (HistCite - Research HUB n.d.), Pajek (Mrvar and Batagelj 2016), or SciMAT (Cobo et al. 2012). However, the evaluation of different tools is out of the scope of this paper. Since we are used to *R* as a convenient statistical tool, and *bibliometrix* is fully integrated and reasonable for our purpose, we consequently applied it in this study.

The first step of the science mapping workflow was loading the data and converting it into an *R* data frame (Aria and Cuccurullo 2017, p. 963). Therefore, the bibliometrix package provides a particular function for Web of Science and Scopus data. Next, the Scopus data frame needed additional fields and a change of sorting for the later merge with the Web of Science data. For Google Scholar, we applied the R-function *ReadBib* of the *RefManageR* package (McLean 2014). Again, with additional fields, a renaming of columns, and new sorting, we adapted the Google Scholar data to the Web of Science format. Finally, we eliminated duplicate entries by title after combining the three files. The remaining records were the final sample for the bibliometric analysis.

This approach corresponds to the checklist item seven of Moher et al. (2009).

Paper selection

According to Moher et al. (2009, p. 2), the paper selection's first step identified the records through database searching. After removing duplicates and filtering by publication date, this study applied the following eligibility criteria:

1. The sources are open access or available through the lookup engines of this paper's authors' affiliation libraries.

2. In the full-text papers, the key terms notably appear. However, it is insufficient to mention them in the references without citation, and it needs arguing about considering them for further examination.
3. The key terms are properties in the studies' research model, methodology, propositions, hypotheses, or findings.

These steps correspond to items six and nine of Moher et al.'s (2009) checklist.

Results

Quantitative analyses
Although the Web of Science quality assurance is the highest reported (Aria et al. 2020, p. 807), the addition of Scopus and Google Scholar resulted in a more general picture of the body of knowledge (Yang and Meho 2007, p. 12). The study counted 345 records on the Web of Science, 307 references on Scopus, and 42 entries on Google Scholar. After eliminating duplicates, there remained 660 records. The *bibliometrix* algorithm filters the records by publication year spanning 1984 to 2022, document type, and average citation per year. As Fig. 6 depicts, the filtering by the period from 1984 to 2022 led to a reduced sample of 631 records.

Table 3 depicts the primary information regarding this collection.

This compilation and the following analyses stem from applying the R tool *bibliometrix* (Aria and Cuccurullo 2017). The collection contains 631 documents published in 501 sources. Furthermore, it shows the number of document contents (keywords), authors, authors' collaboration indexes, and document types.

With an annual growth rate of 7.57%, the annual scientific production of Fig. 3, i.e., the number of articles published per year, shows a growing trend over the last 20 years.

The ten most relevant sources in Table 4 are of considerable validity for the research topic. They consist of high-quality journals, such as *Organization Science*, *Industrial Marketing Management*, or *Long Range Planning*.

Next, we used the words' analysis section in the documents part of *bibliometrix*. The options for counting the most frequent words are the fields *keywords*, *titles*, or *abstracts*. We chose abstracts with *bigrams*, i.e., two-word terms, and the *50 most apparent* words. Another important option is to load a list of *terms to remove*. This list contains regularly used methodological terms, such as *empirical research*, *structural equation*, *equation modeling*, or more general ones, like *success factors* or *future research*.

Figure 4 depicts the most frequent bigrams in the paper abstracts with a treemap.

It shows that *organizational culture* counts 108 and is the third most mentioned after *knowledge management* with 145 and *information technology* with 138. However, if we include *corporate* and *organisational*, the term *organizational culture* is with 166 the most mentioned. The terms regarding *business-IT alignment* are indirect, strategical topics, such as *competitive advantage*, *business strategy*, *strategic alignment*, and *strategic management*. Added up, they occur 148 times.

Table 3 Main information regarding the collection

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1984 : 2022
Sources (Journals, Books, etc.)	501
Documents	631
Annual Growth Rate %	7.57
Document Average Age	10.4
Average citations per doc	19.56
References	25552
DOCUMENT CONTENTS	
Keywords Plus (ID)	1000
Author's Keywords (DE)	1838
AUTHORS	
Authors	1296
Authors of single-authored docs	220
AUTHORS COLLABORATION	
Single-authored docs	225
Co-Authors per Docs	2.13
International co-authorships %	19.97
DOCUMENT TYPES	
Article	476
Book chapter	37
Conference paper	42
Proceedings paper	59
Review	15

Note. Web of Science Core Collection Field Tags: ID = Keywords Plus $^{®}$; DE = Author's Keywords

The study can then draw a conceptional framework picture of the research field with a so-called co-occurrence network or co-word analysis (Aria and Cuccurullo 2017, p. 969). This analysis mapped and clustered the data collection terms from the abstracts. Figure 5 depicts that the node of *organizational culture* has a strong emphasis beside information technology where *strategic alignment* occurs, although to a lower extent.

Qualitative analysis

As the study reports and depicts in Fig. 6, the first step of the literature selection was removing duplicates and filtering the search results by the timespan 1984–2022.

This step resulted in 631 studies and excluded 63 records. Second, after screening the results with *culture/cultural* and *align/alignment* in the abstract, 92 records remained, eliminating 539 entries. Third, from these 92 records, 37 papers were assessed for eligibility by filtering the full texts. The records were deleted if the key terms were not substantially mentioned in the papers and did
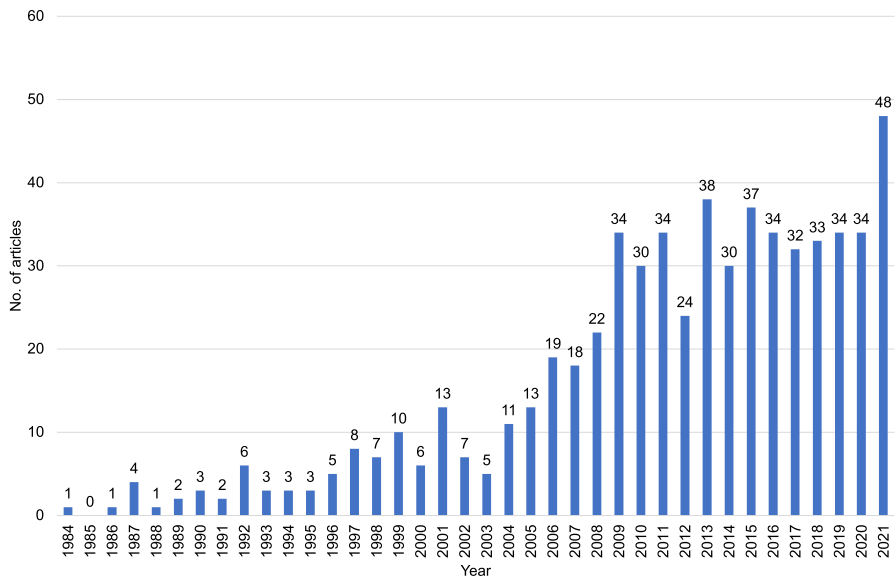
Fig. 3 Annual scientific production

Table 4 Most relevant sources

Sources	Articles	Quality
ORGANIZATION SCIENCE	7	6.87
INDUSTRIAL MARKETING MANAGEMENT	6	2.21
JOURNAL OF MANAGEMENT DEVELOPMENT	5	0.65
LONG RANGE PLANNING	4	3.24
MANAGEMENT DECISION	4	1.16
JOURNAL OF COMMUNICATION MANAGEMENT	4	1.03
BUSINESS PROCESS MANAGEMENT JOURNAL	4	0.84
INFORMATION SYSTEMS MANAGEMENT	4	0.81
MIT SLOAN MANAGEMENT REVIEW	4	0.65
CHINESE JOURNAL OF COMMUNICATION	3	1.00

Note. The quality measure is the SJR 2021 and stems from the Scimago Journal & Country Rank (www.scimagojr.com)

not appear in the research model, methodology, propositions, hypotheses, or findings. Finally, the fourth step assembled 15 articles and conference papers from these 37 records for further analyses. The selected literature had to contribute to the research questions of this paper.

The relationship between organizational culture and business-IT alignment lacks broad examination (Silvius et al. 2009; El-Mekawy et al. 2016). There were few literature review studies in the business-IT alignment research field in the reference
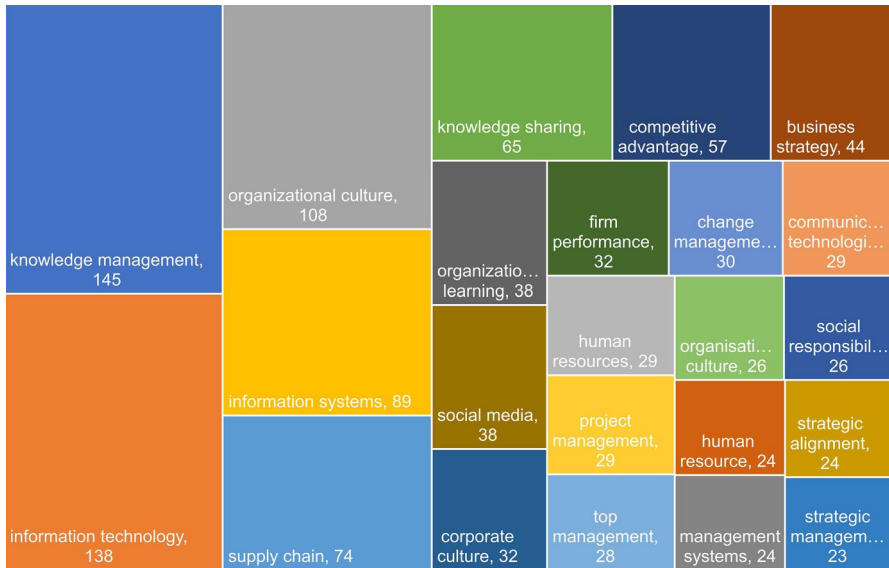
Fig. 4 Treemap of the most frequent bigrams in the abstracts

sample. Moreover, they scarcely investigate organizational or corporate culture properties.

Based on Chan and Reich's (2007, pp. 300–301) alignment dimensions, Spósito et al. (2016, p. 554) found that less than two-thirds of the papers consider culture. Nevertheless, they do not discuss the papers' findings and organizational culture properties further. Therefore, the study is not eligible for this analysis. In her thesis, Aasi (2016, pp. 56–57) discusses six papers with an organizational culture influence on the IT governance's strategic alignment area. Part of them also found entrance in the paper. However, Aasi does not explicitly further examine the relationship, why her thesis is not part of the literature analysis at hand. Also, M. S. A. El-Mekawy (2016, pp. 7–8) only cites a few papers. Finally, Rusu and Jonathan (2017, p. 38) only cite two studies with organizational culture as an influencing factor for the alignment in public organizations. Nevertheless, both papers lack transparent culture or alignment concepts and will not be further analyzed here.

Table 5 shows the compiled studies about the relationships between culture and alignment sorted by type of study, author, and publication year. The collection consists of two literature reviews, one single case study, three multiple case studies, one focus group paper, and nine surveys. This differentiation is notable for the generalization purposes of the studies' findings.

The table gathers the papers with their organizational culture dimensions, alignment concepts, and critical arguments and findings.

The following discussion reflects the findings of the quantitative and qualitative analyses regarding this paper's research questions.
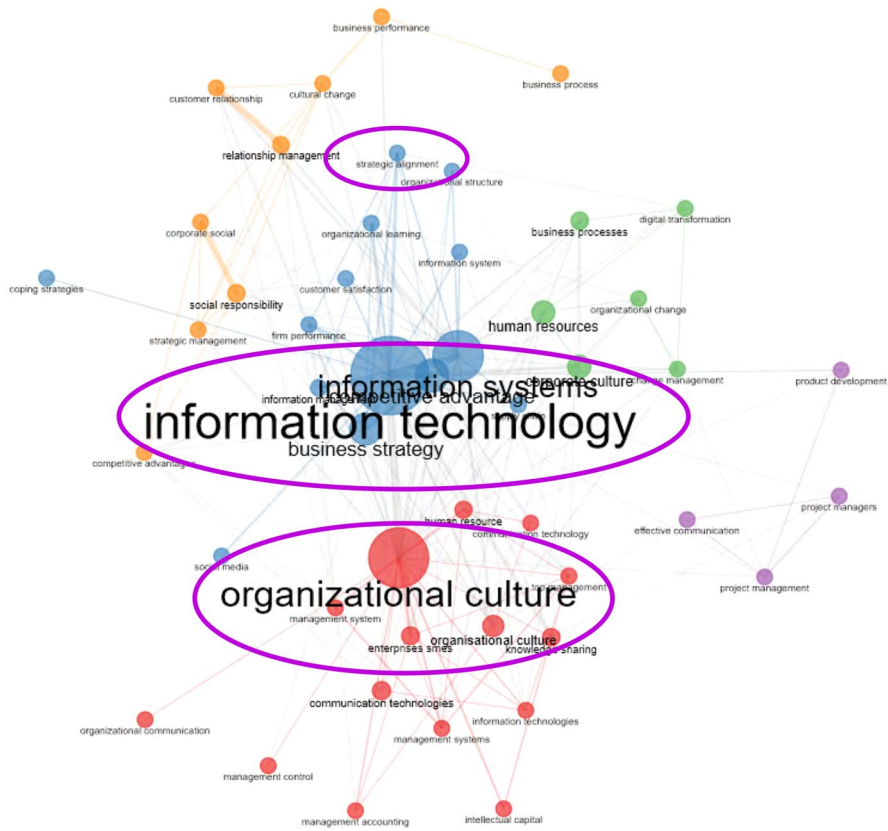
Fig. 5 Co-occurrence network of the bigrams in the abstracts

Discussion

Results of the quantitative analyses

The research on organizational culture and strategic alignment in information technology depicted a *growing interest over time* (Fig. 3). This finding confirms the most crucial IT management concerns (Kappelman et al. 2013, p. 228; Luftman et al. 2013, p. 357). Furthermore, the quality of the sources (Table 4), the most apparent terms (Fig. 4), and their co-occurrences (Fig. 5) reveal the *relevance of the research topics*. However, the co-occurrence network (Fig. 5) shows that strategic alignment and organizational culture are not tightly related. This finding indicates a knowledge and research gap in the literature.

Findings of the qualitative analysis of the selected literature

The findings of the analyzed studies about organizational culture and alignment vary in characteristics and magnitudes (Table 5). We discuss the papers regarding the types of studies in the following.
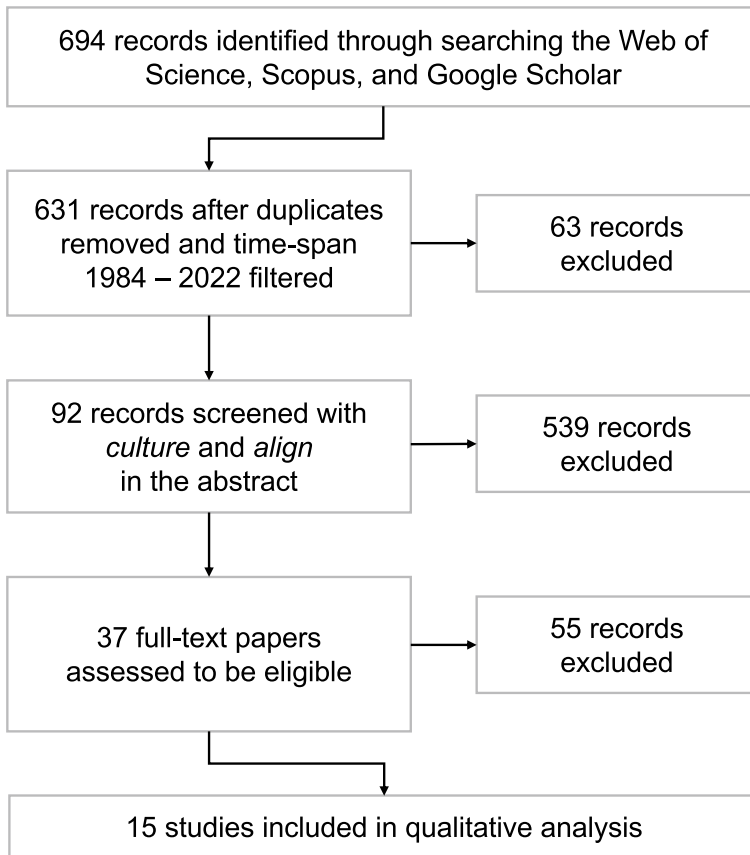
Fig. 6 Literature selection scheme, adapted from Moher et al. (2009, p. 8)

Chan and Reich's (2007) review is still valid and an often-cited work that gives an overview of the most common alignment concepts and discusses culture. Aasi and her colleagues (2017) present another literature review ten years later. They assessed the references on the relationship between culture and the IT governance's five focus areas, of which strategic alignment is one of them. Aasi et al. (2017, p. 22) confirm this study's assumptions that organizational culture and alignment examinations are rare; their questions declare that the investigated papers lack decent knowledge about how different culture dimensions affect IT governance.

Most of the case studies examined information systems implementations. Thereby, Ravishankar et al. (2011) come to this study's research questions the nearest. Although with a specific subcultural focus, they found an influence of organizational culture on a system's alignment and implementation in a large Indian, globally active IT services and consulting company. Boekhoff (1999) refers to Schein's three levels of culture (Schein and Schein 2017). The study is one of the earlier papers

Table 5 Studies about organizational culture and alignment and their findings

Study	OC dimensions	Alignment concepts	Key findings
1. Literature review			
Aasi et al. (2017)	Various cultural value dimensions on an organizational and national level	Strategic alignment is part of IT governance (IT Governance Institute 2003)	OC somehow influences strategic alignment, but the relationship is not precisely defined
Chan and Reich (2007)	Culture as part of the alignment challenges relates to locus of control and the status of IT	Alignment exists in *strategic /intellectual, structural, social,* and *cultural* dimensions, models, and perspectives	Alignment is an ongoing process and end state and needs a collaborative culture that embraces change
2. Case study			
Ravishankar et al. (2011)	Martin and Siehl's (1983) organizational subcultures characteristics	Various alignment dimensions (Henderson and Venkatraman 1993; Reich and Benbasat 2000; Chan 2002)	Subcultures influence IS alignment and implementation on the different management levels
3. Multiple case study			
Boekhoff (1999)	Schein and Schein's (2017, p. 18) culture levels as a model layer	SAM (Henderson and Venkatraman 1993) as a technology layer	Successful IT implementation relies on technology, BITA, and OC
Chan (2002)	Culture as part of the informal organizational structure	SA as the fit between the priorities and activities of the IS function and the business unit	Company culture promotes IS alignment and excellence
Jing-hua et al. (2010)	Denison and Mishra's (1995) cultural traits *involvement, consistency, adaptability,* and *mission*	BITA as understanding, communication, and consistency of IT strategy and business strategy (Luftman 2000)	BITA influences IT application in both the adoption and routinization stage, OC more substantial the routinization one
4. Focus group			
Campbell et al. (2005)	OC as a general variable emerged in focus group workshops	Social and intellectual dimensions of SA (Reich and Benbasat 2000)	SA needs encouraged communication and collaboration
5. Survey			
Abdolvand and Sepehri (2016)	OC is part of the construct variable *organizational plan and characteristics*	Social alignment, as in Reich and Benbasat (2000, p. 82)	Direct connection with others to the strategic alignment
Al-Majali and Dahalin (2011)	*Values* and *beliefs* (Peppard and Ward 1999)	SA as a mediator of competitive advantage	Positive effect of values and beliefs on SA

Table 5 (continued)

Type of study			
Study	OC dimensions	Alignment concepts	Key findings
Bi et al. (2013)	*Market-oriented* culture promotes business value (Narver and Slater 1990)	SA is a planning resource for successful IT strategies	OC/SA influence *activity integration* in business processes
Bi et al. (2017)	*Market-oriented* culture promotes business value (Narver and Slater 1990)	SA is a planning resource for successful IT strategies	OC/SA impact on e-business capability, which mediates the effect of business process competence on performance
Amar and Ben Romdhane (2019)	Cameron and Quinn's (2011) CVF and OCAI	Adapted scales of IS *strategic alignment*, measured by the usage of an ERP system	OC, especially the *clan culture*, potentially determines the IS strategic alignment
Shao (2017)	Development culture with a focus on *change, growth,* and *innovation* (Quinn and Spreitzer 1991)	IS-business alignment as *IS strategy sharing and supporting the business strategy*	Culture moderates the relationship between leadership behaviors and alignment
Shao (2019)	Quinn and Spreitzer's (1991) OC typology	IS-business alignment as *IS strategy sharing and supporting the business strategy*	In addition to 2017, *flexibility* has a positive and *control* a negative influence
Wang et al. (2021)	CVF's (Cameron and Quinn 2011) *market* and *hierarchy* culture	IT-business *process alignment* in manufacturing	Moderating effect of a *control-oriented* culture

Note. BITA = business-IT alignment; *CVF* = Competing Values Framework; *ERP* = enterprise resource planning; *IS* = information systems; *OC* = organizational culture; *OCAI* = Organizational Culture Assessment Instrument; *SA* = strategic alignment; *SAM* = Strategic Alignment Model

that acknowledges that the success of IT implementation and business-IT align-ment is also a function of organizational culture, not only technology. Jing-hua et al. (2010) describe even more robust relationships between business-IT alignment and organizational culture regarding the acceptance of IT applications. Finally, Camp-bell et al. (2005) emphasize that business and IT management leaders and teams should encourage communication and collaboration to achieve strategic alignment.

The survey studies apply an adoption of Cameron and Quinn's (2011) Competing Values Framework (Amar and Ben Romdhane 2019; Wang et al. 2021), the anteced-ent theory of Quinn and Spreitzer (1991) (Shao 2017, 2019), or comparable culture models (Bi et al. 2013, 2017). On the strategic alignment side, the concepts vary more. Amar and Ben Romdhane (2019) succeeded in answering their research ques-tions, like those in this study. By measuring alignment with various adapted scales, they state that organizational culture, especially the *clan culture* type, potentially determines the information systems' strategic alignment. Other studies reveal the influence of *market-oriented* (Bi et al. 2013, 2017) and *hierarchical culture* (Wang et al. 2021) on *business process alignment*.

Table 6 Organizational culture characteristics widely used in the studies					

Study	a [1]	b [2]	c [3]	d [4]	e [5]
Aasi et al. (2017, p. 18)	✓	✓	–	–	✓
Abdolvand and Sepehri (2016, p. 90)	–	✓	–	–	–
Bi et al. (2013, p. 4)	–	–	✓	–	–
Bi et al. (2017, p. 564)	–	–	✓	–	–
Boekhoff (1999, p. 204)	✓	✓	–	–	–
Campbell et al. (2005, p. 6)	✓	–	–	–	–
Chan (2002, p. 101)	✓	–	–	–	–
Chan and Reich (2007, p. 312)	–	–	✓	–	–
Chtourou Ben Amar and Ben Romd-hane (2019, p. 98–99)	✓	✓	✓	✓	–
Jing-hua et al. (2010, p. 14)	✓	✓	✓	✓	–
Nickels and Janz (2010, p. 7–8)	✓	✓	✓	✓	–
Ravishankar et al.(2011, p. 43)	✓	–	–	–	✓
Shao (2017, p. 7)	–	✓	✓	–	–
Shao (2019, p. 97–98)	✓	✓	✓	✓	–
Wang et al. (2021, p. 2)	–	–	✓	✓	✓

[1]Flexibility, involvement, communication, relationship, and team orientation

[2]Change, innovation, risk-taking, future, adaptability, creativity, and entrepreneurial orientation

[3]Results, competition, performance, and market orientation

[4]Control, stability, predictability, efficiency, roles, routinization, and consistency orientation

[5]Top management leadership, cross-unit cooperation, and quality initiatives

Table 6 gathers the studies with a particular emphasis on organizational culture characteristics. Again, the papers use the organizational culture constructs as independent variables, except for Shao (2017, 2019) and Wang et al. (2021), in which organizational culture is in a moderating position.

Most investigations argue that culture is *flexible* while maintaining *employee or human relationships*, *communication and information*, *personnel empowerment*, and *team orientation*. Column *a* of Table 6 reveals these notions and assignments. In terms of the Competing Values Framework (Cameron and Quinn 2011), this matches the organizational culture type of a *clan*. With considerable flexibility and discretion, the *clan* is like an extended family, where people share a lot of themselves (Cameron and Quinn 2011, p. 48).

Also often are *change readiness*, *innovation*, or *risk-taking*, in studies assigned to *b*, and *market orientation* with *achievement*, *power*, *competition dominance*, and *growth-accent* in column *c*. The first words under *b* match the *adhocracy culture* as an entrepreneurial environment that welcomes venturing and readiness for change (Cameron and Quinn 2011, p. 51). The second under *c* fits the *market culture* type with stability and control and the core values of competitiveness and productivity (Cameron and Quinn 2011, p. 44).

To a lesser magnitude, follow *(un)certainty*, *consistency*, and *efficiency orientation* (*d*), and *top management leadership* (*e*). Regarding the Competing Values Framework, the first notions under *d* meet the *hierarchy culture* with the aim of a smooth running and coordinated organization (Cameron and Quinn 2011, p. 42).

So, the organizational culture characteristic variables and constructs fit the Competing Values Framework (Cameron and Quinn 2011), also presented by Chtourou Ben Amar and Ben Romdhane (2019, pp. 98–99).

Conclusions

This study systematically reviewed information technology management's typical organizational culture and business-IT alignment. Therefore, it applied the PRISMA statement (Jackson et al. 2015; Moher et al. 2009). This method helped screen, select, and illuminate the eligibility process of the literature for further examination. After refining the search results with appropriate document types, research categories, subject areas, and keywords, the study analyzed the references. The bibliometrics' science mapping showed the research topic's relevance and possible gaps. The quantitative analyses told us nothing about the IT management's organizational culture characteristics, i.e., this paper's first research question. However, since the meaningful terms organizational or corporate culture and strategic alignment were not tightly related, this result indicated a research gap regarding the contribution of culture to business-IT alignment. The full-text analysis of a few eligible papers revealed that a relationship between IT management culture and business-IT alignment exists. This finding appeared in the case and survey studies about implementing information systems. For example, those studies reported a clan—in terms of Cameron and Quinn's (2011) Competing Values Framework (CVF), people in IT see themselves as belonging to an extended family— a market-oriented or a hierarchical

organizational culture. Such IT management culture characteristics significantly influence the alignment of business and IT. However, most studies used general alignment definitions and did not apply decent models, such as Henderson and Venkatraman's (1993) Strategic Alignment Model (SAM).

Besides these theoretical implications, this paper contributes methodologically to the conduction of literature reviews. Notably, the choice of the search databases is delicate. The Web of Science collection is of the highest reported quality (Aria et al. 2020, p. 807), but the results are somehow restricted. If the research questions are concrete and the research gap apparent, the Web of Science is suitable. For exploratory studies as the paper at hand, the addition of Scopus and Google Scholar is beneficial, considering their specific limitations. However, the researcher's most significant challenges are combining the search terms, i.e., the appropriate application of Boolean operators and the innovative refining of the relevant literature.

This article has certain *limitations*. Although highly systematic, the research procedure with the included/excluded search terms and the refining of the search results are subjective. Reliability and validity would improve if this article relied on similar studies or called for the support of other scholars or experts. Nevertheless, we provided the reader with a transparent search strategy and review protocol. Then, the bibliometric analyses relied on one particular software solution. Although the applied tool is regularly maintained and builds upon open-source statistical packages, the procedure needed manual interventions. Finally, the qualitative analysis of the eligible papers provided only a snapshot of the relationship between organizational culture and business-IT alignment and would require further examination.

What are the *learnings* since Chan and Reich (2007)? Fifteen years later, business-IT alignment still fascinates scholars to a large extent. As Table 5 depicts, the research subjects range from IT governance, strategic alignment, and strategic planning to social elements, such as communication and relationship management. On the organizational culture's side, the properties vary as well. Nevertheless, the dimensions and scales often rely on examined constructs and models, such as Schein's culture levels (2017, p. 18), Denison and Mishra's (1995, p. 216) cultural traits, or Cameron and Quinn's (2011) CVF. This paper finds a mixture, *not a one-fits-all* solution regarding the *first research question* about typical IT organizational culture characteristics. However, most examined studies use terms and notions that best match the CVF.

The relationship between organizational culture and business-IT alignment is more complicated than the individual business-IT alignment and organizational culture characteristics on their own. The literature review shows for this study's *second research question* that the cultural influences on business-IT alignment achievements are weak, punctual, very situational, and lack distinct theoretical and empirical underpinnings. Future research will benefit from systematically applying established models, such as the CVF and SAM. Although the examined studies repeatedly focus on information technology issues at the management and firm level, only a few are about the concrete relationship between organizational culture and business-IT alignment.

So, the contribution of this paper to the body of knowledge is merely incremental but scientifically valuable (Corley and Gioia 2011). Hence, the article calls for

further investigations in explaining and measuring the research questions. It proposes to apply the CVF and SAM systematically. The two orthogonal models give a comprehensive picture of their respective research topics of organizational culture and business-IT alignment (see Figs. 1 and 2). Moreover, their juxtaposition implies that both models and corresponding dimensions relate to each other.

Consequently, the CVF influences the SAM, and the CVF culture types affect the SAM perspectives. First, the *market culture* with its external focus and the need for stability and control fits the *business strategy* with its external orientation and functional integration. Second, the *adhocracy culture* type and the *IT strategy* strategic alignment perspective are both outward- and differentiation-oriented. The adhocracy culture highlights flexibility and discretion and equals the IT strategy, which helps the business acquire new IT competencies and technologies. This matching is quite similar to the tightrope walk of IT management, which simultaneously supports IT innovation and business transformation (Chan and Reich 2007, p. 312). Third, the *clan*'s internal and integrative perspective suits the *IS infrastructure and processes* with an internal IT focus. For example, managers of small and medium enterprises should support their IT and its strategy and actively seek strategic alignment (Chan and Reich 2007, p. 312). Finally, the internal- and stability-oriented *hierarchy culture* harmonizes with the *organizational infrastructure and processes*, which align IT services to the business. So, further qualitative and quantitative analyses of these relationships can enlighten this paper's research focus.

Declarations

Conflict of interest The first author receives financial support from his affiliation for his ongoing dissertation project. Besides that, the authors have no further relevant financial or non-financial interests to disclose.

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