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Research article

Determinant factors of cloud-sourcing decisions: reflecting on the IT outsourcing literature in the era of cloud computing

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Abstract

Cloud computing (CC) is an emerging form of IT outsourcing (ITO) that requires organizations to adjust their sourcing processes. Although ITO researchers have established an extensive knowledge base on the determinant factors that drive sourcing decisions from various theoretical perspectives, the majority of research on cloud-sourcing decisions focuses on technological aspects. We reviewed the CC and ITO literature and systematically coded the determinant factors that influence sourcing decisions. We show that most determinant factors of sourcing decisions in the ITO context remain valid for the CC context. However, the findings for some factors (i.e., asset specificity, client firm IT capabilities, client firm size, institutional influences, and uncertainty) are inconclusive for the CC and ITO contexts. We discuss how the peculiarities of CC can explain these inconclusive findings. Our results indicate that CC researchers should draw from research on ITO decision making but re-examine ITO concepts in the light of the peculiarities of CC, such as the differences between software and infrastructure services, the self-service procurement of cloud services, or the evolving role of IT departments. By summarizing determinant factors of cloud-sourcing decisions for consideration in future research, we contribute to the development of endogenous theories in the IS domain.

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Introduction

Cloud computing (CC) changes how organizations manage their IT landscape, challenges traditional IT governance approaches, and requires organizations to adjust their sourcing processes (Yanosky, 2008; Armbrust *et al.*, 2010; Winkler and Brown, 2013; Ragowsky *et al.*, 2014). With CC, organizations can gain on-demand network access to a shared pool of managed and scalable IT resources, such as servers, storage, and applications (Mell and Grance, 2011). Because IT sourcing decisions entail substantial economic and strategic risks (Martens and Teuteberg, 2009; Benlian and Hess, 2011), managers must have extensive judgment and insight regarding organizational structures, interdependencies, processes, and habits to thoroughly comprehend decision alternatives and the set of required structural choices (McIvor and Humphreys, 2000; Cullen *et al.*, 2005; Moses and Åhlström, 2008; Aubert *et al.*, 2012). However, empirical insight into cloud-sourcing decisions remains scarce (Yang and Tate, 2012).

CC is an evolution and specific form of IT outsourcing (ITO); thus, the extensive body of research on ITO provides a valuable basis for investigating cloud-sourcing decisions. During the last two decades, IS researchers have applied various economic, strategic, organizational, and social theories to identify determinant factors that drive ITO and have produced a considerable body of knowledge on ITO decision making (Dibbern *et al.*, 2004; Lacity *et al.*, 2010). However, rather than leveraging this insightful body of knowledge on ITO, the majority of research on the determinant factors of cloud-sourcing decisions focuses on technological aspects of CC and their implications for decision making (e.g., Koehler *et al.*, 2010; Wu *et al.*, 2011; Brender and Markov, 2013; Gupta *et al.*, 2013; McGeogh and Donnellan, 2013).

client interface (e.g., a web browser). In the context of SaaS, users do not own, manage, or operate the underlying infrastructure, platform, or even individual application capabilities (Mell and Grance, 2011). Examples range from complex enterprise applications, such as SAP Business ByDesign, to office, email, and collaboration services, such as Google Apps.

Public clouds are owned, managed, and operated by external providers and are made available to the general public over the Internet (Armbrust *et al.*, 2010: 50), whereas *private* clouds are 'provisioned for exclusive use by a single organization' (Mell and Grance, 2011: 3) and are not available to the general public. However, given clouds' public availability, security and privacy have become important concerns in public CC (European Network and Information Security Agency, 2011; Jansen and Grance, 2011). Private clouds are 'easier to align with security, compliance, and regulatory requirements [than public clouds]' (Ramgovind *et al.*, 2010: 2), but they offer fewer benefits, for example, in terms of cost reduction and scalability. Mixed forms of private and public clouds aim to combine the benefits of both public and private clouds. *Community* clouds are 'controlled and used by a group of organizations that have shared interests, such as specific security requirements' (Marston *et al.*, 2011: 180), where 'its strengths and weaknesses fall between those of a private cloud and those of a public one' (European Network and Information Security Agency, 2011: 55). *Hybrid* clouds are a combination of public and private cloud services; 'typically, noncritical information is outsourced to the public cloud, while business-critical services and data are kept within the control of the organization' (Marston *et al.*, 2011: 180).

During recent years, CC has received enormous attention from academics and practitioners, resulting in a disparate collection of publications from research and practice. To synthesize the body of knowledge on CC, researchers have conducted literature reviews that provide a general overview of CC research (Yang and Tate, 2012), that focus on a specific domain (Ermakova *et al.*, 2013), or that focus on particular aspects, such as security (Khorshed *et al.*, 2012). However, this study is the first to survey and synthesize the literature on IT sourcing decisions, to discuss differences between findings on CC and ITO, and to derive determinant factors of cloud-sourcing decisions. To distinguish this literature review from previous literature reviews, an overview of existing literature reviews on CC is presented in Appendix A.

Cloud-sourcing decisions

The unit of analysis in this article is *determinant factors of cloud-sourcing decisions*. We define a *cloud-sourcing decision* as an organization's decision to adopt and integrate cloud services from external providers into their IT landscape, that is, the customer organization's assessment of CC offerings from one or more providers in any form of service model (IaaS, PaaS, SaaS) or deployment model (public, private, community, hybrid). We thereby explicitly exclude organizational (internal) activities related to data center virtualization and IT services provided by an internal IT department.

Concerning IT sourcing decisions, researchers have investigated a range of dependent constructs, including the 'intention to increase the level of SaaS adoption' (Benlian and Hess, 2011), 'ASP adoption intention' (Yao *et al.*, 2010), 'netsourcing decision' (Loebbecke and Huyskens, 2006), or the 'degree of IS outsourcing' (Ang and Straub, 1998). These examples highlight researchers' use of different constructs to denote adoption decisions of various sourcing options (e.g., CC, ASP, ITO). In our work, we follow Lacity *et al.* (2010, 2011) and use one meta-construct to subsume these constructs, that is, the *IT sourcing decision*.

Cloud computing as new form of ITO

ITO can be defined as 'the significant contribution by external vendors in the physical and/or human resources associated with the entire or specific components of the IT infrastructure in the user organization' (Loh and Venkatraman, 1992a: 9). Cost advantages, flexibility, and competitive advantages are possible benefits that have made ITO one of the most important strategic concepts in recent decades (Leimeister *et al.*, 2010) and an intensively studied field within IS research (Dibbern *et al.*, 2004; Lacity *et al.*, 2010).

Application service provision (ASP) is a 'form of outsourcing, specifically selective outsourcing, where firms rent packaged software and associated services from a third party' (Bennett and Timbrell, 2000: 196). Jayatilaka *et al.* (2003) extend this definition and define ASP as an IS application service that is offered, hosted, and managed by a vendor on a rental basis. Researchers argue that SaaS emerged as an advanced form of ASP (Heart, 2010; Benlian and Hess, 2011) and that CC 'has the same key attributes as the "standard" ASP model, and exposes the user to the same risks' (Schwarz *et al.*, 2009: 774). The definitions of ASP and SaaS as well as their similarities in strategic, technical, and economic opportunities and risks (Kern *et al.*, 2002; Schwarz *et al.*, 2009; Armbrust *et al.*, 2010; Marston *et al.*, 2011) support this proposition. Furthermore, both ASP and SaaS share similar business and pricing models (Weinhardt *et al.*, 2009). Given the purpose of this research and the similarities between ASP and SaaS, we consider SaaS to be an advanced form of ASP and do not further differentiate these two sourcing options.

CC and ITO share common characteristics and provide similar benefits to users; research findings on ITO adoption are thus applicable to CC adoption to a certain extent (Benlian and Hess, 2011; Malladi and Krishnan, 2012; Chen and Wu, 2013). However, certain peculiarities regarding CC distinguish it from ITO and therefore induce the need to re-examine the determinant factors of sourcing decisions for CC. For instance, compared with traditional ITO, CC induces a shift in task responsibilities during decision processes and self-service procurement, provides standardized services with a narrower scope, enables new scenarios of outsourcing and governance arrangements, and uses short-term usage-based contracts (Susarla *et al.*, 2010; Benlian and Hess, 2011; Malladi and Krishnan, 2012; Chen and Wu, 2013). Table 1 summarizes the major differences between CC and ITO.

To determine what we can learn from the rich body of research on ITO and to identify determinant factors of cloud-sourcing decisions, we use the arguments listed in Table 1 as analytical devices to discuss the differences identified in the literature between CC-related findings and ITO-related findings. Therefore, we first survey the literature and aggregate the existing research on IT sourcing decisions. The next section describes our literature search, selection, and coding methods.

Research method

In this section, we first describe the scope of the literature review and the criteria that we applied to identify the 88

Table 1 Comparison of cloud computing and IT outsourcing

	Cloud computing	*IT outsourcing*
Decision process	● SaaS: business department as key client ● IaaS/PaaS: IT department as key client ● Predominantly self-service ● Vendor selection bound to product selection, product-based decision ● Online trial evaluations ● Task responsibilities shifted from provider to customer, for example, for request for proposal evaluation *vs* self-service evaluation	● Large outsourcing contracts with high strategic relevance, top management as key clients ● Request for information/request for proposal ● Vendor selection prior to decision on degree of outsourcing
Scope	● Standardized software (SaaS) or cloud infrastructures (IaaS/PaaS) created by the provider for an anonymous market ● Role of the IT department as service integrator ● Limited customization	● Custom-tailored IT services ● Can include hardware, software, people, and processes (e.g., software development, datacenter operations, desktop maintenance, help desk operations)
Governance mode	● Enables new scenarios of outsourcing and governance arrangements due to the variety of service models (IaaS, PaaS, SaaS) and deployment models (private, public, community, hybrid) and combinations thereof ● Enables the management of building blocks of IT, provided by external providers in the same way as they would be managed in-house ● Ownership, mode, and degree partially predefined by the selected service and deployment model	● Individual configurations of ownership, mode, and degree
Ownership	● Outsourced assets totally owned by the provider and its providers	● Varies with type and degree of outsourcing ● Totally owned by the customer ● Partially owned by the customer ● Totally owned by the provider
Mode	● Single vendor/client or multiple vendors/ clients	● Single vendor/client or multiple vendors/clients
Degree	● Selective outsourcing	● Total outsourcing ● Selective outsourcing
Contractual mode	● Short term ● Usage based ● High degree of automation and scaling ● Minimal up-front costs ● Little possibility for negotiation, standardized terms of use	● Long term ● Period based or project based ● Individually negotiated ● Pricing based on business metrics ● Strategic partnerships for continuous and joint innovation
Environment	● Decentralized market ● Volatile and immature market ● Uncertain legal issues	● Outsourcing market is well established with numerous experienced providers
Broad network access	● Critical network dependence ● Potential bottlenecks, slowdowns, and outages that neither the client nor the vendor can control	● Depends on the type of outsourcing (e.g., less critical for software development than for datacenter operations)
Resource pooling	● Multi-tenant virtualized applications ● Common code stack ● Provider-determined upgrade schedule	● None

Note: This table was constructed based on the following: (Loh and Venkatraman, 1992a; Lacity and Hirschheim, 1993a; Bennett and Timbrell, 2000; Kakabadse and Kakabadse, 2002; Kern *et al*., 2002; Jayatilaka *et al*., 2003; Morabito, 2003; Serva *et al*., 2003; Dibbern *et al*., 2004; Narayandas, 2005; Dhar and Balakrishnan, 2006; Pollock and Williams, 2007; Xin and Levina, 2008; Benlian *et al*., 2009; Schwarz *et al*., 2009; Susarla *et al*., 2010; Benlian and Hess, 2011; Martens and Teuteberg, 2011; Marston *et al*., 2011; Mell and Grance, 2011; Vetter *et al*., 2011; Giessmann and Stanoevska, 2012; Malladi and Krishnan, 2012; Lacity and Willcocks, 2013; Sunyaev and Schneider, 2013; Wollersheim *et al*., 2013; Ragowsky *et al*., 2014).

relevant articles that were published before April 2014. We then explain the applied method to code and aggregate the determinant factors of IT sourcing decisions.

Scope of the review

To ensure a high-quality literature review, we followed the guidelines by Webster and Watson (2002). This structured approach assumes that the major contributions in a research field are primarily found in journals of high reputation and quality. Therefore, we considered the Senior Scholars' Basket of Journals (Association for Information Systems, 2011) and the top 50 journals (including selected ACM/IEEE Transactions) of the AIS journal ranking (Association for Information Systems, 2005). To include the latest research on CC but still focus on high-quality contributions, we broadened the scope by additionally considering leading conferences of the IS community. The peer selection of outlets considered in this literature review consisted of 68 journals and 3 conferences (see Appendix B). We aimed to gather all contributions dedicated to CC or related paradigms that focus on sourcing decisions. We therefore searched publications by title, keywords, and abstract using the following list of keywords: (Cloud OR IaaS OR PaaS OR SaaS OR XaaS OR 'Infrastructure as a Service' OR 'Platform as a Service' OR 'Software as a Service' OR 'IT service' OR 'Application Service' OR ASP OR Outsourcing) AND (Adoption OR Assimilation OR Choice OR Decision OR Determinant OR Diffusion OR Driver OR Infusion OR Inhibitor OR Option OR Select OR Usage OR Use).

Inclusion and exclusion criteria

We included only completed peer-reviewed research articles that empirically investigate organizational sourcing decisions in the context of CC, ASP, or ITO and excluded conceptual articles, news articles, and reviews of prior research. To transfer findings from the ITO context to the CC context and to discuss what the literature on cloud-sourcing decisions can learn from the literature on ITO decisions (i.e., which findings are transferable to the CC context and which findings might require reconsideration), we had to limit the context of the ITO articles included to a common denominator. Therefore, studies concerning ITO were included only if they investigate sourcing decisions that are similar to sourcing decisions for cloud services. We used the following inclusion criteria for the selection process:

Applicability to CC

When considering articles concerning ITO, we referred to the descriptive ITO framework of de Looff (1995), who describes which parts of an organization's IT function are outsourced according to three dimensions:

- functional information systems (the business process that a system supports or controls, such as customer relationship management or order scheduling);
- components (hardware, software, data, personnel, and procedures); and
- activities (planning, development, implementation, maintenance, and operation).

For example, an organization can outsource the *development* of the *software* for a *customer relationship management system*. To include only outsourcing types that are comparable to sourcing decisions concerning one of the three cloud service models (IaaS, PaaS, and SaaS), we included only articles that investigate *selective outsourcing* of at least the *maintenance and operation* of the *hardware or software* of *any functional information system* to an *external provider* while keeping the business process itself in-house. Therefore, we excluded, for example, research focusing on software development, help desk, desktop maintenance, or business process outsourcing, as these types of outsourcing are specific in terms of the associated managerial problems, required capabilities, and implications for the workforce (Lacity and Hirschheim, 1993b; Baldwin *et al.*, 2001; Wholey *et al.*, 2001). For studies that investigate the outsourcing of multiple functions and that distinguish their results according to outsourced functions, we referred to the subsample and results of the outsourced function that is similar to CC (e.g., we used the subsample of 'system & data center operations' in Dibbern and Heinzl (2009)).

External services

This research focuses on services delivered by external providers. We excluded organizational (internal) activities related to data center virtualization and IT services provided by the internal IT department, as the managerial implications of internal IT service provision differ from those of outsourcing. For instance, internally delivered cloud services are easier to align with security, compliance, legal, and regulatory requirements than externally delivered cloud services (European Network and Information Security Agency, 2011). Thus, inhibitors such as data location (Browning and MacDonald, 2011), vendor lock-in (Armbrust *et al.*, 2010), and loss of control (Spink, 2010) play a subordinate role in internal cloud service provision.

Private sector

Because certain factors play a significant role in public sector sourcing decisions but not in private sector sourcing decisions (Arlbjørn and Freytag, 2012), we included only articles that investigate sourcing decisions for private sector organizations. For instance, only cloud service providers that are certified by the Federal Risk and Authorization Management Program (FedRAMP) are allowed to provide cloud services for US public sector organizations (General Services Administration, 2012). Furthermore, specific laws and regulations apply (e.g., the Federal Information Security Management Act of 2002; Title 44 US Code § 3541, et seq.), and different stakeholders or forces have a voice in public sector sourcing decisions (e.g., the government). Thus, to retain focus on a similar set of outsourcing decisions, we excluded public sector studies (e.g., Janssen and Joha, 2011).

Identification of 88 empirical articles on IT sourcing decisions

Execution of the search string and application of the defined inclusion criteria resulted in 48 relevant articles. Backward search (14 relevant articles) and forward search (14 relevant articles) were conducted subsequently. Additionally, we conducted a backward search on selected CC and ITO literature reviews (Lacity *et al.*, 2009; Martens and Teuteberg, 2009; Lacity *et al.*, 2010, 2011; Venters and Whitley, 2012; Yang and Tate, 2012) and identified 12 additional relevant articles. Thus, the total set of articles considered in this literature review includes 88 articles that have been published before April 2014 without limiting the time frame (see Appendix C for a list of all articles). In total, 60 articles (68%) are quantitative, and 28 are qualitative (32%). The majority of the articles originate from the ITO research stream (45 articles, 51%). ASP is the focus of 20 articles (23%), and CC is the focus of 23 articles (26%), 12 of which are dedicated to SaaS and 11 of which are dedicated to general CC.

Variable coding

We coded the 88 relevant articles based on the method developed by Jeyaraj *et al.* (2006) and applied to the ITO context by Lacity *et al.* (2010, 2011). The applied method enabled us to include results from both qualitative and quantitative studies. To aggregate the findings across studies, we adapted the iterative method of Lacity *et al.* (2010) that requires individual articles to be coded multiple times. In each iteration, we followed a three-step approach to examine a set of 20 randomly selected articles. To ensure consistent coding, two researchers independently coded all of the articles and discussed any conflicting results after each iteration.

Step 1: Code author variables
For each independent and dependent variable in an article, we coded the name and definition as given by the authors ('author variable' and 'author variable definition').

Step 2: Code relationships
We coded each examined relationship between the independent and dependent variables. To uniformly code the relationships between the independent and dependent variables from qualitative and quantitative studies, we applied the coding template of Lacity *et al.* (2010), which is depicted in Table 2. For each relationship, one of four possible values was assigned (+, –, M, 0).

Step 3: Code master variables
We independently combined and aggregated the coded author variables (see step 1) and developed a set of 'master variables' and 'master variable definitions' (see Appendix E for the variable definitions). Each researcher independently mapped the author variables of the 20 articles on the master variables. The master variables were complemented by new master variables in each iteration. If new variables were added, then previously coded articles were re-examined to determine whether any variables needed to be refined based on the addition of the new master variables. After each iteration, we met and discussed the master variables and relationship coding. Variable definitions as well as conflicting mappings and relationships were discussed and adapted. This process continued until all of the articles were coded.

Verification of coding and grouping of master variables

One researcher conducted a final check through all of the articles and coded relationships to ensure that all of the variables were coded consistently with the master variable list. For consistency checks, each master variable definition was cross-checked with the definitions of all of the author variables mapped on the master variable as well as the definitions from seminal theoretical articles (e.g., Williamson (1981) for asset specificity).

To facilitate discussion of a large number of variables that cover diverse facets of IT sourcing, we categorized the variables into seven broader categories. We divided the factors into the following categories: asset characteristics, technology characteristics, solution characteristics, client firm characteristics, individual characteristics of the decision maker, environmental characteristics, and vendor firm characteristics. The variables and categories evolved inductively from the literature.

Identification of determinant factors of cloud-sourcing decisions

To identify the determinant factors of cloud-sourcing decisions with consistent results in previous research, we counted the number of times that the relationship between a master variable and the dependent meta-variable IT sourcing decision was studied and the number of times that this relationship is reported to be positively significant, negatively significant, nonsignificant, or significant but non-directional (e.g., categorical variables, see Table 2). Next, we applied the decision rule of Lacity *et al.* (2010) and identified master variables that have been *examined multiple times* and that have produced *consistent results*. In terms of *multiple examinations*, we extracted all of the master variables that were empirically examined to influence sourcing decisions at least five times. In terms of *consistent results*, we selected only master variables for which at least 60% of the findings are consistent (i.e., significantly positive, significantly negative, or significant but non-directional). This minimum threshold ensures that more than half of the evidence produced the same findings.

We then divided our coding results into two batches. The first batch consists of coded relationships between the master variables and sourcing decisions in the ITO context, and the second batch consists of coded relationships between the

Table 2 Relationship coding scheme, adapted from Lacity *et al.* (2010)

Code	*Meaning*
+	Positive relationship: a higher value of the independent variable is associated with a higher value of the dependent variable; $P<0.05$ for quantitative studies or strong argument by authors for qualitative studies
–	Negative relationship: a higher value of the independent variable is associated with a lower value of the dependent variable; $P<0.05$ for quantitative studies or strong argument by authors for qualitative studies
M	The relationship matters: the relationship between a categorical independent variable (e.g., industry) and a dependent variable is significant but non-directional; $P<0.05$ for quantitative studies or strong argument by authors for qualitative studies
0	Relationship was studied and no significant relationship was found

master variables and sourcing decisions in the CC context (including ASP because we treated ASP as form of SaaS; see background section). We assessed each extracted master variable by comparing and contrasting the coded relationships for CC and ITO. The next section reports the results of our assessment and presents the factors with consistent empirical evidence for CC, the factors with consistent empirical evidence for ITO but only limited evidence for CC, and the factors with contradicting or inconclusive findings in the CC and ITO contexts.

Findings

The coding of 88 empirical articles on IT sourcing decisions resulted in 625 relationships between the independent and dependent variables, of which 542 have a direct influence and 83 have an indirect influence (e.g., second-order constructs or moderators) on IT sourcing decisions. Of the 542 relationships related to sourcing decisions, 272 were coded for the CC model, and 270 were coded for the ITO model. We aggregated the independent variables for all studies into a set of 111 independent master variables (see Appendix E for the definitions). The entire coding scheme is available from the authors upon request.

Appendix D lists the set of 111 master variables and the 542 aggregated relationships between the master variables and sourcing decisions. Appendix D provides details on the most frequently studied variables in the CC and ITO contexts as well as results from empirical examinations of the relationships between the independent variables and IT sourcing decisions. The findings are briefly discussed below.

Asset characteristics

We denote the asset as an object of the sourcing decision, that is, the object being outsourced. Asset characteristics are specific to the type of asset that is considered for sourcing from an external service provider, such as the strategic importance of the application being outsourced. Independent variables that examine the influence of asset characteristics on sourcing decisions are the most frequently studied among the seven categories. This category contains 17 independent variables that have been examined 140 times. Cost savings is the most commonly studied determinant (51 times: 22 times for cost savings in general, 20 times for production costs, and 9 times for transaction costs), followed by asset specificity (37 times: 15 times for technical specificity, 11 times for site specificity, and 11 times for human asset specificity), and the strategic importance of the asset (13 times).

The results for only two variables (cost savings and the strategic importance of the asset) are consistent for both CC and ITO (i.e., the same findings at least 60% of the time and at least five examinations for both CC and ITO). The results for the two variables measurement problems and technical complexity are consistent for ITO only, as research on this variable in the CC context is lacking. Further, the results for cost uncertainties are consistent in the overall sample, but research on this variable is lacking in both subsamples (investigated fewer than five times in each subsample). Finally, the results for asset specificity are consistent for CC but inconsistent for ITO.

Solution characteristics

Solution characteristics denote characteristics that are specific to a concrete solution (i.e., a cloud service), such as functional characteristics or contract specifics. The solution characteristics category consists of seven independent variables whose influence on sourcing decisions has been examined only eight times. Consequently, because of a lack of empirical evidence, none of the variables meets our inclusion criteria. The only independent variable whose influence on sourcing decisions was studied twice is perceived contract clarity, and both studies report a positive, significant relationship between perceived contract clarity and sourcing decisions (Pinnington and Woolcock, 1995; Currie *et al.*, 2004).

Technology characteristics

Technology characteristics include determinant factors that are inherent to the particular sourcing option (i.e., CC or ITO), such as the risk of losing access to data and the benefits of increased scalability. Researchers have investigated a rich array of technology characteristics as determinant factors of IT sourcing decisions, predominantly concerning the risks or benefits of the desired sourcing option. In all, the relationship between technology characteristics and sourcing decisions has been examined 128 times. Technology characteristics include 19 independent variables, nine of which are specific benefits and four of which are specific risks of the examined sourcing option. Some studies aggregate several risks or benefits within one generic risk/benefit construct (e.g., Daylami *et al.*, 2005), others investigate how specific risks/benefits influence sourcing decisions (e.g., Saya *et al.*, 2010), and others employ a two-stage model (e.g., Benlian and Hess, 2011). Some technology characteristics are conceptualized as benefits (e.g., better security (Gupta *et al.*, 2013) or increased availability (Currie *et al.*, 2004)) as well as risks (e.g., availability risks (Lechesa *et al.*, 2011) or security risks (Wu *et al.*, 2011)). The most frequently examined benefits are access to specialized resources (20 times), a focus on core competencies (17 times), and flexibility (16 times). The most frequently examined risks are security concerns (15 times), loss of control (eight times), and availability concerns (five times).

The results for only two independent variables are consistent for CC and ITO decisions (access to specialized resources and flexibility gains). The result for security risks, availability risks, reduced time to market, and perceived complexity are consistent for CC, but research on these variables in the ITO context is lacking. Focus on core competencies and quality improvements have consistent results in the ITO context; however, research on these variables in the CC context is lacking. The results for risk of losing control are consistent in the overall sample, but research on this variable is lacking in both subsamples.

Client firm characteristics

With 24 independent variables, the client characteristics category contains the most variables among the seven categories. Researchers have examined the influence of client characteristics on sourcing decisions 127 times. Client size is the most frequently discussed variable in this category (26 times). Furthermore, researchers have investigated determinant factors such as internal IT capabilities (22 times) and industry (10 times). Only the results for industry are consistent results with both models. The results for top management support are consistent for ITO only, as findings on this variable in the CC context are scarce. Further, the results for internal IT capabilities are consistent for ITO but inconsistent for CC, and the results for client size are inconsistent with both models. The results for strategic vulnerability are consistent in the overall sample, but research on this variable is lacking in both subsamples.

Individual characteristics

Findings on the individual level are scarce, as most articles adopt a firm-level perspective. This category contains 13 variables, which researchers examined 22 times in relation to sourcing decisions. Only the influence of a decision maker's attitude toward outsourcing has been examined more than five times, and the results are consistent in the overall sample, but research on this variable is lacking in both subsamples.

Environmental characteristics

Overall, the 23 variables within the category of environmental characteristics have been examined 86 times. In our sample, uncertainty (24 times: 17 times for environmental uncertainty and seven times for behavioral uncertainty), market maturity (16 times), and institutional influences (24 times: 14 times for mimetic pressures, six times for coercive pressures, three times for normative pressures, and one time for an aggregated construct) are the most commonly examined independent variables. Market maturity is the only independent variable with consistent results across both models. The results for uncertainty are inconsistent for both CC and ITO, while the results for institutional influences are consistent for ITO but nonsignificant for CC.

Vendor firm characteristics

Vendor characteristics include eight variables that have been examined 31 times in total. Vendor service capability (14 times), support (four times), and trustworthiness (three times) are the most commonly examined independent variables in this category. Service capability is the only independent variable that has been examined more than five times, and the results are consistent for CC, although research on this variable in the ITO context is lacking.

Intermediate summary of findings

A comparison of findings from the ITO literature with findings from the CC literature, as summarized in the preceding section, revealed three types of determinant factors: (i) factors with consistent empirical evidence regarding their influence on cloud-sourcing decisions; (ii) factors with consistent empirical evidence regarding their influence on IT sourcing decisions but only limited evidence for the CC context (examined fewer than five times in the CC context); and (iii) factors with inconclusive empirical evidence in the CC and ITO contexts. For the first type of factors, the empirical results are consistent in the CC literature and are lacking in the ITO literature or are consistent in both the ITO literature and the CC literature. For the second type of factors, consistent empirical results have not yet been reported in the CC literature, but they show promise as determinant factors of cloud-sourcing decisions because the results for these factors are consistent in the overall sample and/or in the ITO sample. The third type of factors requires further discussion because the results for the two subsamples are inconclusive. Since the results for factors of type (i) and (ii) are already consistent in the literature (for either CC or ITO or for both), we do not further discuss these factors. We include these factors in our suggestions for further research, as researchers have already provided strong empirical evidence for their influence on IT sourcing decisions. Figure 1 depicts the derived factors of type (i) and (ii). To identify the most robust findings, we adapt a tiered legend from Lacity *et al.* (2010), which is based on the proportion of consistent findings in the overall sample. We use the symbol '++' if more than 80% of the evidence shows a positive and significant relationship between the independent variable and the dependent variable (IT sourcing decision). We use the symbol '+' if 60%–80% of the evidence is

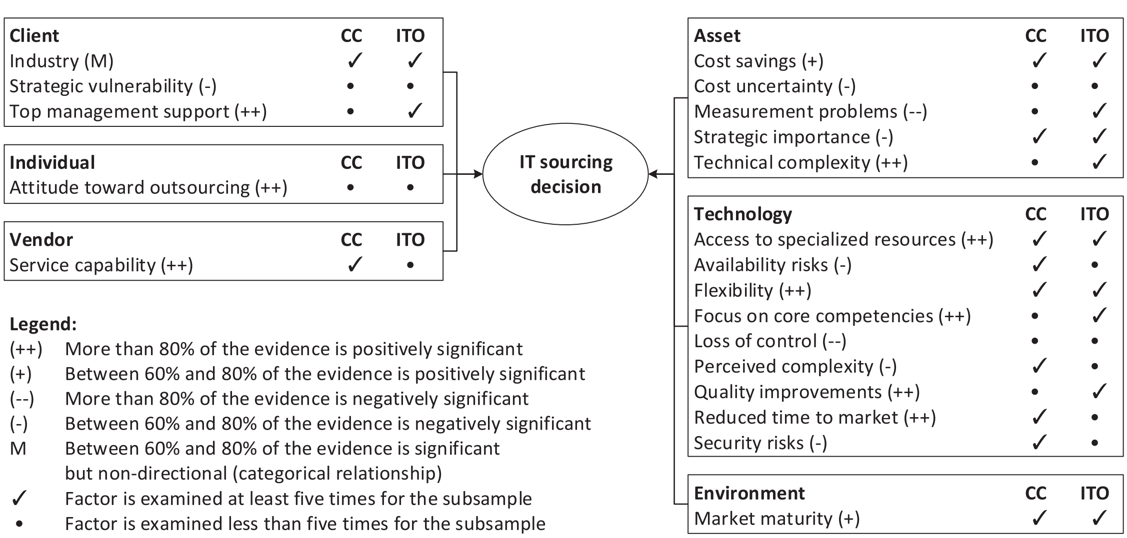

Figure 1 Determinant factors with consistent empirical evidence regarding the influence on IT sourcing decisions.

significantly positive. Likewise, we use '−−' for relationships that are shown to be significantly negative more than 80% of the time and '−' if 60%–80% of the evidence is significantly negative. The symbol '✓' indicates for each subsample (CC, ITO) whether a factor is examined at least five times with consistent evidence, while the symbol '•' indicates that the factor lacks examinations for the subsample (less than five times examined).

To fulfill the objective of this article and to maintain a concise and meaningful discussion, the next section focuses on the puzzling differences and inconclusive findings in the determinant factors of sourcing decisions between CC and ITO. Table 3 summarizes the factors with inconclusive results.

Discussion of findings

In this section, we discuss the factors with inconclusive and contradicting results in the CC and ITO contexts. We therefore use the arguments in Table 1 (see background section) to examine whether the inconclusive findings can be explained by peculiarities in the CC sourcing model. We discuss each factor according to the following structure. First, we summarize the main results of the articles that examined each factor. We then discuss why there may be inconsistencies between the CC and ITO contexts and offer recommendations for future research based on our discussion. Table 4 summarizes the factors that we discuss in this section, the arguments regarding which peculiarities of CC (see Table 1) could explain the identified inconsistencies, and the factors that might induce context-specific results because of interaction effects with other factors.

Asset characteristics

Asset specificity is used in reference to three major categories of assets: site specificity, physical asset specificity (also referred to as technical specificity), and human asset specificity (Williamson, 1981).

Site specificity is examined 11 times in total, including eight times for CC and three times for ITO. Except for one occurrence for CC (Loebbecke and Huyskens, 2006), all findings show a significant, negative influence of this factor on sourcing decisions (91%) (e.g., Dibbern *et al.*, 2003). Hence, the findings are consistently negative for CC and for the overall sample, but there is a lack of evidence regarding this factor in the ITO context.

The increased network dependence of CC increases the risks that affect site specificity, such as the risk of service breakdowns because of possible network outages, which may result in a temporary loss of access to data. Hence, site specificity requires particular consideration for assets that are required on a daily basis (e.g., a customer relationship management system). Furthermore, resource pooling increases the risk of information leakage (Brender and Markov, 2013) resulting from malicious behavior in shared environments (Subashini and Kavitha, 2011). In this context, site specificity concerns not just specific resources that are only available on-site (e.g., geographical location of an investment) but also restrictions on the data that are stored and processed within the asset (Rieger *et al.*, 2013). Hence, site specificity requires particular consideration for assets that store sensitive data or that are liable to specific regulatory requirements (e.g., accounting systems). Site specificity may also be moderated by differences between service models, for instance, an asset that bears a strong competitive advantage, such as an advanced algorithm or a newly developed method (e.g., 'Summly' (Lessin, 2013)). A company may not want to outsource software development to an external contractor because knowledge could be leaked (high site specificity). However, running the algorithm in compiled code with external IaaS or PaaS solutions to increase the scalability of its use could be a valid sourcing option. By contrast, if a strategic advantage does not evolve from the asset to be outsourced (e.g., an application) but rather emerges from the data that are stored within the application (e.g., highly detailed consumer data that are stored in a market researcher's database), then cloud sourcing may not be a feasible option. Companies that rely on their unique data cannot allow such data to leak. However, outsourcing the software development of the application that grants access to their database may be an acceptable solution for such companies.

As discussed above, several indicators facilitate the need for context-specific considerations of site specificity as a determinant of cloud-sourcing decisions. In particular, we emphasize the need to distinguish the influence of site specificity according to the type of asset that is outsourced and the service model that is under consideration.

The relationship between *technical specificity* and sourcing decisions is examined 15 times in the examined articles, including 10 times in the CC context and five times in the ITO context. For ITO, the results for technical specificity are inconsistent (a significantly negative influence two of five times (40%) (Aubert *et al.*, 1996; Wholey *et al.*, 2001) and a significantly positive influence one of five times (20%) (Aubert *et al.*, 2004). For CC, six of the ten studies (60%) are consistent and report a significant, negative influence (e.g., Watjatrakul, 2005). However, 20% (two of ten times) report a significant, positive relationship (Diana, 2009; Asatiani *et al.*, 2014), which is contrary to the predictions of TCE, and an additional 20% report no significant relationship (Loebbecke and Huyskens, 2006; Benlian *et al.*, 2009).

Loebbecke and Huyskens (2006) argue that technical specificity may nevertheless generate transaction costs when applications are run remotely, but these increased transaction costs do not exceed cost savings arising from economies of scale. Thus, these cost savings may simply outweigh issues related to technical specificity. Furthermore, the influence of technical specificity is expected to vary with company size (Benlian, 2009; Asatiani *et al.*, 2014). For instance, Benlian *et al.* (2009) find that technical specificity has the strongest effect on large enterprises because large enterprises tend to have complex, highly specific business processes in place that are supported by fragmented IT infrastructures with legacy systems and

Table 3 Determinant factors with inconclusive empirical evidence regarding the influence on ITO decisions and the influence on cloud-sourcing decisions

Determinant factor	*Cloud computing*	*IT outsourcing*
Asset specificity	−	Inconsistent
Client firm internal IT capabilities	Inconsistent	−−
Client firm size	Inconsistent	Inconsistent
Uncertainty	Inconsistent	Inconsistent
Institutional influences	Nonsignificant	+

Table 4 Summary of discussion of inconclusive findings, the peculiarities of CC that might explain the inconclusive findings, and recommendations for future research

Determinant factor	*Peculiarities of cloud computing that might explain inconclusive findings*	*Factors to consider in future research that might yield context-specific results*
Asset specificity		
Site specificity	• Broad network access: increased network dependence • Resource pooling: multi-tenant applications • Governance mode: different service models	• Type of asset to be outsourced (usage frequency, strategic importance) • Service model under consideration (SaaS *vs* IaaS/PaaS)
Technical specificity	• Scope: standardized services • Governance mode: different service models	• Company size • Service model under consideration (SaaS *vs* IaaS/PaaS) • Type of asset to be outsourced (strategic importance) • Environmental uncertainty
Human asset specificity	• Contract: scalability • Governance mode: different service models	• Type of asset to be outsourced (technical complexity, strategic importance) • Service model under consideration: human asset specificity as a driver for IaaS/PaaS and inhibitor for SaaS
Client – firm internal IT capabilities	• Governance mode: different service models • Scope: role of the IT department as service integrator	• Service model under consideration: lack of internal IT capabilities as driver for SaaS and inhibitor for IaaS/PaaS • Recent recruiting of IT personnel
Client firm size	• Decision process: self-service procurement	• Type of asset to be outsourced (green field or replacement of existing system)
Uncertainty		
Environmental uncertainty	• Contract: scalability, pay per use • Decision process: self-service procurement	• High demand uncertainty as driver; high product uncertainty as inhibitor • Type of asset to be outsourced (strategic importance, technical specificity)
Behavioral uncertainty	• Contract: short-term contracts, pay per use, measured service • Environment: volatile and immature market	• Type of asset to be outsourced (technical specificity, switching cost, measurement problems, strategic importance) • Market maturity
Institutional influences		
Coercive pressures	• Environment: uncertain legal conditions	• Industry • Type of asset to be outsourced (site specificity)
Mimetic pressures	• Environment: volatile and immature market	
Normative pressures	• Environment: Standardization movement • Governance mode: community cloud as deployment model	

heterogeneous applications. Thus, the role of technical specificity may vary with company size when applications or infrastructure components are outsourced.

Increasing standardization efforts in the field of CC (Bernnat *et al.*, 2012), open interfaces, interoperability, and custom-built mash-ups of cloud services enable customers to build highly specific solutions that may reduce the negative influence of technical specificity in the CC context. The market for SaaS is growing, and external business applications are increasingly provided externally (Winkler and Brown, 2013). Organizations are able to use cloud services even for complex enterprise software, such as enterprise resource planning or customer relationship management. Diana (2009) argue that highly complex IT environments may present more opportunities for outsourcing arrangements (e.g., outsourcing single, highly specific applications to an

Coercive pressures are studied six times in the examined articles, four of which are in the CC context (only one time (25%) with a significantly negative influence) and two of which are in the ITO context (both finding a significantly negative influence).

The CC environment is characterized by uncertainty and a lack of transparency that inhibits adoption, as well as an immature legal situation, as indicated by legal conflicts between the United States and Europe in data protection principles (Boehler and Ramos, 2014) or the latest information revealed about the NSA PRISM program (Cloud Security Alliance, 2013). Six studies investigate coercive pressures. The three studies that show a significant, negative influence are all in industries with strong governmental regulation, such as financial services (Ang and Cummings, 1997; Rieger *et al.*, 2013) and health care (Wholey *et al.*, 2001). Lian *et al.* (2014) investigate coercive pressures in the health-care sector (Taiwan hospitals) and find no significant influence. The authors argue that the Taiwan government has implemented an electronic medical record policy that is a driver of CC adoption rather than an inhibiting factor. The other studies showing a nonsignificant influence of coercive pressures focus on multiple industries (Borgman *et al.*, 2013; Kung *et al.*, 2013).

Hence, we argue that industry-specific effects may lead to inconsistent results regarding coercive pressures and that coercive pressures should be specifically examined with regard to companies' originating industry. In this context, interaction effects with the degree of site specificity of the outsourced asset (e.g., related to the type of data that are stored in the outsourced asset) may arise, and these effects should thus be considered in future research as well.

The results on the influence of *mimetic pressures* on sourcing decisions are inconsistent in both CC and ITO research. In total, mimetic pressures are studied 14 times, including four times in the CC context and ten times in the ITO context. The influence of mimetic pressures on cloud-sourcing decisions is significantly positive in only one of four (25%) articles (Wu *et al.*, 2011), whereas in eight of ten (80%) articles, the influence of mimetic pressures on ITO decisions is positive and significant (e.g., Fiedler *et al.*, 2013).

The findings regarding the effect of mimetic pressures on cloud-sourcing decisions may be inconclusive because mimetic pressures may influence sourcing decisions indirectly rather than directly. Saya *et al.* (2010) report that institutional influences significantly affect perceived risks (e.g., security) and perceived benefits (e.g., accessibility) but do not directly affect cloud-sourcing decisions. Similarly, Benlian *et al.* (2009) find that the opinions of experts or market researchers play a major role in shaping the attitudes of top management toward cloud sourcing but that they have no direct influence on sourcing decisions. These authors argue that organizations appear 'not to blindly follow the recommendations of other organizations by unreflectively imitating their behavior. Instead, the opinions of third parties seem to inform in the IT user companies' process of building their own attitude about SaaS'. This argument is consistent with the nonsignificant results of Blaskovich and Mintchik (2010), who find a significantly positive influence of mimetic pressures on cloud-sourcing decisions only when CIO skills are weak. Considering the high level of uncertainty within the CC environment, mimicking organizations that are perceived to be more legitimate or successful is a response to uncertainty (DiMaggio and Powell, 1983). Decision makers are influenced by the environment both inside and outside their organization, and both sources of influence are strong predictors of sourcing decisions (Loh and Venkatraman, 1992b; Dibbern *et al.*, 2012). Hu *et al.* (1997) argue that the combined effects of external media, vendor pressure, and internal communications among managers at the personal level significantly influence sourcing decisions. More specifically, Morgan and Conboy (2013) report that customers are negatively preoccupied about the term cloud, and because of this perception, service providers avoid mentioning the term cloud *per se* and instead refer to a new service delivery model.

Although findings on the direct influence of mimetic pressures on cloud-sourcing decisions are scarce in the CC context, we argue that mimetic influences should be considered in further research as a determinant factor of cloud-sourcing decisions, particularly with respect to other factors from social or organizational theories, as research has shown that these relationships are strong and significant in the CC context (Benlian *et al.*, 2009; Saya *et al.*, 2010; Wu *et al.*, 2011).

Normative pressures are investigated only three times (including two times in the CC context). The results for CC show a positive, significant influence in one of the two studies (50%) (Kung *et al.*, 2013), and the single study in the ITO context (Fiedler *et al.*, 2013) also shows a positive, significant relationship.

Because of the limited number of empirical investigations on normative pressures, we cannot draw conclusions based on our coding results. However, with the maturation of the cloud market and the establishment of cloud-dedicated industry associations, such as the Cloud Security Alliance or EuroCloud, a large number of norms and best practices for CC have been established. The International Organization for Standardization (ISO) is currently developing a code of practice for information security controls for CC in alignment with the prominent ISO 27000 series of standards (International Organization for Standardization, 2013). Furthermore, community cloud as a deployment model enables industry associations to provide members with cloud services that implement industry best practices and that are compliant with industry-specific regulations.

Increasing standardization efforts that are particularly suited to CC and the emergence of community cloud platforms for specific industries might drive organizations to consider CC adoption. We therefore suggest that future research incorporate normative pressures and challenge the argument regarding whether cloud-specific standardization movements and community cloud platforms drive cloud-sourcing decisions.

Implications for research

The synthesis of the literature on determinant factors of IT sourcing decisions enables us to draw conclusions based on not only the in-depth discussion of contradicting findings between research on CC and research on ITO (Figure 1, Table 3, and Table 4) but also the emergent trends in the literature. This section discusses implications for future research based on both types of findings.

To answer our first research question, we examined what we can learn from the rich body of research on ITO to identify result in common challenges (e.g., internet connectivity, monitoring and pricing, resource management) and similar factors driving sourcing decisions. However, given our discussion (e.g., regarding the service model-specific considerations of asset specificity or the internal IT capabilities of the client firm) and empirical evidence related to outsourcing different types of IS functions (Lacity and Hirschheim, 1993a; Benlian *et al.*, 2009; Dibbern and Heinzl, 2009), the determinant factors of decisions to source SaaS solutions may considerably differ from the determinant factors of decisions to source IaaS or PaaS solutions. Although research on IaaS and PaaS is evolving (e.g., Giessmann and Stanoevska, 2012; Repschlaeger *et al.*, 2012), research on the determinant factors of sourcing decisions related to these service models and the differences between the service models is currently lacking. We therefore call for further research on specific cloud service models, particularly research on IaaS and PaaS adoption and comparative research on the service models.

Additionally, we encourage further research to provide inter-group comparisons, as extant research has already revealed various differences between investigated groups, such as adopters *vs* non-adopters (Benlian and Hess, 2011; Borgman *et al.*, 2013; Lian *et al.*, 2014), and differences among countries (Apte *et al.*, 1997), industry sectors (Hancox and Hackney, 2000; Currie *et al.*, 2004), and outsourced functions (Benlian *et al.*, 2009; Dibbern and Heinzl, 2009). For instance, Benlian and Hess (2011) find noteworthy differences between the influences of benefits and risks for adopters *vs* non-adopters of SaaS. IT executives in non-adopter firms expect SaaS to improve the quality of their services and to enable a focus on core competencies, but these factors fail to drive SaaS adoption at adopter firms. In addition to identifying these differences, future research should provide evidence for the underlying mechanisms driving differences, for instance, between adopter and non-adopter firms.

Drawing from the entire set of 88 articles, we find that researchers have applied various theories to examine IT sourcing decisions. Overall, TCE (32 times) and the resource-based view of the firm (16 times) are the most frequently used theories. The majority of research applies macro-perspective theories, for both CC and ITO. Macro-perspective theories consider factors from the standpoint of an entire organization, whereas a micro-level perspective concerns an individual decision makers' standpoint (Vetter *et al.*, 2011). In all, 80 articles apply a macro-perspective (e.g., Yao *et al.*, 2010), only five articles investigate determinant factors on the micro level (e.g., Li *et al.*, 2006), and only three adopt a mixed perspective (Dibbern *et al.*, 2003; Benlian *et al.*, 2009; Lian *et al.*, 2014). Researchers applying multiple perspectives or integrating micro- and macro-level theories emphasize the strong explanatory power of behavioral theories and demand further combinations of theories from various fields, such as economics and psychology. We therefore emphasize the need for further research applying a micro-level perspective to investigate cloud-sourcing decisions. We suggest that future research combine factors from strategic and economic theories with factors from social or organizational theories, particularly determinant factors from the categories individual characteristics and environmental characteristics.

Most of the studies (63 articles, 72%) draw empirical data from top management (executive board or senior managers) and neglect other members of the procurement team. However, organizational decision making involves multiple stakeholders from inside and outside the organization (Heckman, 2003; Verville and Halingten, 2003). Each stakeholder group shapes the decision process and outcome; engages in different activities, possesses specific decision rights, responsibilities, and information needs; and pursues a unique set of goals (Webster and Wind, 1972; Howcroft and Light, 2010; Bidwell, 2012; Harnisch *et al.*, 2013; Winkler and Brown, 2013). For instance, a legal department may require different information and may have different requirements for cloud services than an IT department or the business unit (Schneider *et al.*, 2014). In particular, because of the peculiarities of CC, such as the changed role of the IT department and the adapted decision processes, research adopting the perspectives of multiple stakeholders regarding cloud-sourcing decisions might yield fruitful results. None of the articles investigated in this study adopts a multi-level perspective and evaluates differences in determinant factors between stakeholder groups or between hierarchical levels in a company. We therefore propose that future research adopt a multi-stakeholder perspective and evaluate differences in stakeholder perceptions. This suggestion is consistent with recent calls for research on CC, ITO, and packaged software acquisition (Benlian *et al.*, 2009; Howcroft and Light, 2010; Bidwell, 2012).

Table 5 summarizes our discussion and proposes future research directions.

Limitations

This research has certain limitations. First, we conducted a systematic literature review to derive the determinant factors of cloud-sourcing decisions. Our results inform a set of determinant factors to provide a basis for further research on cloud-sourcing decisions. Although our derived set of determinant factors does not depict the interdependencies, mediation, or moderation effects of factors, we provide suggestions regarding the moderating or interaction effects among the factors in our discussion (see Table 4 for a summary). Second, the process of selecting studies may also generate discussion. For articles focusing on ITO, authors do not always specify the type of ITO decision on which the article focuses. Some studies examine mixed types of outsourcing activities, for instance, by combining software development outsourcing and datacenter operations in a single sample, or do not clearly define the type of outsourcing that they investigate. However, by having two researchers review each article, we aimed to reduce the subjectivity of the article selection. Third, the body of knowledge considered for this research is limited to the keyword search within the top 50 publications of the AIS journal ranking and selected conferences. By applying forward and backward search processes, we aimed to mitigate this limitation. Although we cannot guarantee that we identified every CC and ITO article that investigates sourcing decisions, we are confident that we achieved good and reasonable coverage, which is preferred to 'a comprehensive one that would make a review process at best ephemeral if not unachievable' (Rowe, 2014: 246). Finally, we acknowledge that our coding may be subjective to a certain extent. In particular, this subjectivity may arise if researchers do not clearly define the variables that are used or if the definitions of the author variables to map on a master variable are ambiguous.

Table 5 Proposed directions for future research

- Incorporate determinant factors from Figure 1 in future research
  - Consider factors from the non-technology context for cloud-sourcing decisions
  - Consider 'good' predictors of cloud-sourcing decisions in the ITO context
  - Consider 'good' predictors of ITO decisions in the CC context
- Empirically clarify the reasons for the inconclusive findings between the determinant factors of cloud-sourcing decisions and the determinant factors of ITO decisions and incorporate the suggested factors into context-specific future research (see Table 4)
  - Conduct in-depth research (e.g., field or case studies) to identify how and why differences manifest between CC and ITO (e.g., decision processes)
  - Conduct inter-group comparative research to clarify context-specific deviations
  - Conduct service-model specific research to identify differences in the determinant factors between service models (particularly IaaS and PaaS)
- Address gaps identified in research on CC and ITO decision making
  - Apply micro-level theories and focus on individual-level sourcing decisions
  - Apply multi-stakeholder perspectives to evaluate differences in stakeholder perceptions regarding determinant factors

However, we are confident about the reliability and validity of our findings because of the rigorous coding approach based on independent coding by two researchers and discussion of diverging variable coding.

Conclusion

In this work, we conducted a systematic literature review, surveyed and synthesized prior empirical research concerning decision making in the CC and ITO contexts, and examined the rich body of research on ITO to identify determinant factors of sourcing decisions in the CC context. We linked the ITO literature with the CC literature and discussed what the CC literature can learn from the ITO literature (i.e., which findings are transferable and which findings might need reconsideration). We then discussed whether the peculiarities of CC can explain differences between the determinant factors of ITO decisions and the determinant factors of cloud-sourcing decisions. We extracted the most frequently studied determinant factors with robust results, discussed the inconclusive findings, identified gaps in the literature, and suggested paths for future research. Furthermore, we discussed inter-dependencies between the variables and peculiarities of CC that may elucidate the inconsistent findings in prior research. Therefore, the article serves as both a repository of past research and a guide for future research.

The contribution of this review is threefold. First, we derived a set of determinant factors of cloud-sourcing decisions from research within the IS community. Our results provide a basis for future research in the CC context and contribute to the development of theory in the IS domain. We thereby answer the call of Lacity *et al.* (2011) for the development of an 'endogenous ITO theory rather than continuing to rely heavily on reference discipline theories' (p. 147). IS researchers can draw from our derived set of determinant factors of cloud-sourcing decisions to advance research on decision making or acquisition in the field of CC. By discussing inconclusive findings regarding the determinant factors of cloud-sourcing decisions, we identified contextual factors that are specific to the CC sourcing model and that may alter the influence of specific determinant factors of sourcing decisions. Based on these discussions, we provided concrete paths for future research endeavors. Second, we applied a method developed in IS research (Jeyaraj *et al.*, 2006) and demonstrated its applicability to a different research setting. Third, our work contributes to practice, as the determinant factors of cloud-sourcing decisions serve as a basis for practitioner-oriented guidelines and best practices regarding how to select and offer cloud services. Furthermore, practitioners may use the set of determinant factors to guide their procurement processes and to identify challenges that may arise during the adoption, acquisition, or integration of cloud services.

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