

# International Journal of Information Systems and Project Management

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Volume 5 | Number 4

Article 5

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2017

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Björn Johansson  
*Lund University*

Mirella Muhic  
*Lund University*

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### Recommended Citation

Johansson, Björn and Muhic, Mirella (2017) "Relativism in the Cloud: Cloud Sourcing in virtue of IS Development Outsourcing - A literature review," *International Journal of Information Systems and Project Management*: Vol. 5 : No. 4 , Article 5.

Available at: <https://aisel.aisnet.org/ijispm/vol5/iss4/5>

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## Relativism in the Cloud: Cloud Sourcing in virtue of IS Development Outsourcing - A literature review

### **Björn Johansson**

Department of Informatics, School of Economics and Management, Lund University  
Ole Römers väg 6, Lund SE-223 63  
Sweden  
[www.shortbio.org/bjorn.johansson@ics.lu.se](http://www.shortbio.org/bjorn.johansson@ics.lu.se)

### **Mirella Muhic**

Department of Informatics, School of Economics and Management, Lund University  
Ole Römers väg 6, Lund SE-223 63  
Sweden  
[www.shortbio.org/mirella.muic@ics.lu.se](http://www.shortbio.org/mirella.muic@ics.lu.se)

### **Abstract:**

Nowadays Cloud Computing and Cloud Sourcing is on the agenda in many organizations. Many Chief Information Officers (CIOs) that urge for alternatives to traditional outsourcing are interested in how they can take advantage from Cloud Computing, by sourcing Information Technology (IT) from the cloud. This paper provides an overview of the research direction of Cloud Sourcing in the IS field. A literature review based on selected papers from top Information Systems (IS) journals and conferences were conducted. Findings from the review indicate that the attention of Cloud Sourcing in IS literature has mainly been directed towards security and risk as well as adoption issues, and that Cloud Sourcing is claimed to be the next generation of outsourcing. Unfortunately, this is where this strong claim ends without any further evidence, which indicate that there is a need for more research on Cloud Sourcing, especially in the direction of investigating relationships and implications when organizations start using Cloud Sourcing.

### **Keywords:**

Outsourcing; Cloud Sourcing; Cloud Computing; IT operations; IT maintenance; IT development.

**DOI:** 10.12821/ijispm050404

**Manuscript received:** 7 November 2017

**Manuscript accepted:** 8 December 2017

## 1. Introduction

Information Technology (IT) outsourcing has been around for many years [1, 2] and organizations have been using outsourcing of IT for different reasons [3, 4]. Outsourcing of information systems development represents a significant transfer of assets, leases, and staff to a vendor that assumes profit and loss responsibility [5]. One of the reasons have been to more or less close down their own IT department and instead use another organization to deal with both IT operations as well as IT development but also IT maintenance. The IT operation part, which includes hosting of data centers, seems to be easy to replace with the Cloud Sourcing phenomena. However, it could be questioned if the other two parts, IT development and IT maintenance also could be replaced by a Cloud Sourcing solution. The first and maybe most obvious answer to that question is perhaps that Cloud Sourcing will not replace that, since Cloud Sourcing is basically delivery of services, and services are basically IT operation.

Outsourcing is traditionally based on a complex set of contractual relationships between a focal unit and a vendor. This is adopted to externalize simple tasks and refocus on core competencies, resources and capabilities. We believe that the implementation of a Cloud Sourcing solution in an organization would not change the IT-department drastically except excluding IT operations from their agenda, and giving them more time to work on IT development and IT maintenance (which indeed could be outsourced in a traditional way). Especially since adopting a cloud sourcing solution does not include a transfer of staff or any other assets. Cloud Computing or Cloud Sourcing is seen as a force to count on, and even companies that were skeptical in the beginning have now started to use cloud computing to retain their competitiveness on the market. Cloud computing has become the companies backbone of many social media intensive businesses such as Facebook, Google and Microsoft. According to Babcock [6] and Leimeister et al. [7], cloud computing is an evolution of outsourcing. Cloud computing or Cloud Sourcing as referred to from now on (these definitions will be used interchangeably) also entails similar purchase processes as the more traditional IT outsourcing which is defined by de Looft [8] as the act of shifting some or all of the IS-activities to be performed externally by contractual agreement. Thereby Cloud Sourcing can be defined as the outsourcing of IT resources [6]. The main reasons for outsourcing is according to Lacity et al. [9] cost reduction, access to technological expertise and shifting focus on the organizational core competences. Hirschheim and Lacity [10] suggest more studies to be conducted on how to manage IT outsourcing relationships the best way. It can definitely be said that this also relates to studies about Cloud Sourcing, especially since the estimation of usage of Cloud Sourcing is high. Muller [11] stated based on a survey published by Avande in 2011 "Global Survey: Has Cloud Computing Matured?" that an estimation is that 74 percent of enterprises are using some form of cloud services which is a 25 percent growth since 2009, which tells us that this is a highly relevant topic of research. The survey is based on 573 C-level executives, business unit leaders, and IT decision makers in 18 countries.

In this study we aim at providing new light on Cloud Sourcing as means of outsourcing. It can be stated that previous scientific studies have not addressed the relationship between IT outsourcing and Cloud Sourcing in depth. While it is true that Cloud Sourcing or the Software as a Service (SaaS) model has been discussed in sources aimed at practitioners, it does not necessarily as stated by Martens and Teuteberg [12] follow that the topic of concern has been as discussed in journals aimed at a scientific audience.

Vaquero et al. [13] defines cloud as a large pool of easily usable and accessible virtualized resources (such as hardware, development platforms, and/or services). Which but also entails the possibilities of outsourcing IT development and IT maintenance in the cloud. These virtualized resources can be modified and adjusted to utilize the most of organizations' resources. Although there are concerns of security, privacy and vendor lock-ins being the negative side of Cloud Sourcing [14]. Indeed the main benefit of Cloud Sourcing is the elasticity and flexibility of computing that Cloud Sourcing offers.

Cloud Sourcing could be seen as part of an organizations IS strategy, just as traditional outsourcing has been in many ways. Dhar [15] compared the similarities and differences between traditional outsourcing and Cloud Sourcing and concluded that Cloud Sourcing creates a fundamental shift in the evolution of IT service delivery by reducing costs and increasing flexibility to a greater extent, which traditional outsourcing also does but in Cloud Sourcing these strategic

benefits are greater. Formalization, benefits and operationalization of Cloud Sourcing has not yet been fully addressed in academic research according to Hahn et al. [16] who also claims that Cloud Sourcing certainly is a form of outsourcing. Cloud computing vendors are competing with traditional vendors [17] and it is a matter of time to tell whether Cloud Sourcing indeed can replace traditional information systems development (ISD) outsourcing. Until then there is a huge lack in research on cloud strategies such as on cultural impact, application adoption risk profile, etc. that need to be addressed.

More specifically our research objective is to explicate visions and insights that have been researched and discussed in the academic world guided by the following questions:

- What is discussed in IS research around Cloud Sourcing?
- How does research in IS on outsourcing relate to Cloud Sourcing?

The first purpose of this paper is to review the field of Cloud Sourcing in IS literature. The second and foremost purpose is then to observe whether Cloud Sourcing in IS literature is seen as a future mean of outsourcing.

The rest of the article is organized as follows: In the next chapter, we present the research method that consisted of a literature review. The findings from the literature review is then presented in chapter 3. Finally we discuss the findings, presents some concluding remarks, and suggest future research.

## 2. Methodology

As presented in the introduction it is a fact that Cloud Sourcing is already in vision as seen by practitioners, however, a question to ask is how Cloud Sourcing has been addressed in research studies. What studies has been done and what are the focus of these studies. To say something about this a literature review was conducted. The review aimed at investigating what is written about Cloud Sourcing in relation to outsourcing. This means that a sober analysis of the IS sourcing literature on Cloud Sourcing was done. One reason behind doing the literature review is that Cloud Sourcing is claimed to even increase the benefits of sourcing [11]. This conclusion adds weight to the aim to reveal what has been researched on Cloud Sourcing and if it corresponds to the perception of Cloud Sourcing being the next generation of outsourcing as predicted by Gartner [18].

The literature review was based on IS top conferences: ECIS, AMCIS, ICIS, PACIS and the AIS basket of eight journals: European Journal of Information Systems, Information Systems Journal, Journal of AIS, Journal of Information Technology, Journal of MIS, Journal of Strategic Information Systems, MIS Quarterly, and Information Systems Research. The key words used for the search were Cloud Sourcing, IT sourcing, Outsourcing, IT outsourcing, and IT strategy. The reason for choosing both top journals and top conferences in the field of IS, is to be able to get hold of both the hottest topics of the conferences and what has been published academically in the journals. The searches were delimited to abstract, title and subject, and the publication time was not delimited even though it became obvious that the notion of cloud computing and Cloud Sourcing has not been discussed further back than to 2008. In total 33 papers were reviewed. Admittedly, the review process did involve to some extent personal interpretation of the definitions applied in the research papers. The majority of the papers focusing on Cloud Sourcing were written between 2011-2013.

Each papers abstract, introduction, analysis and conclusion sections were read. The selection criteria for papers to be included in the review was that the article must focus on Cloud Sourcing. We are aware that searching in other sources and databases might have resulted in different results to some degree.

In order to conduct our literature review we used a systematic way adopted by previous scholars in IS [19, 20] and is based on Dubé and Paré [21]. In particular, the steps we followed were: 1) Selection of Journals and Conferences 2) Identification of relevant articles 3) Classification of the articles into categories based on their content 4) Assessment of

the number of articles in each category 5) Analysis of the categories for discovering research trends and future recommendations. Especially, in the fifth step we also included a comparison between the Journals and Conferences.

### 3. Cloud sourcing in the IS-sourcing literature

The literature review, which initially focused on the publication years 2008 –2013, found 33 papers. These paper were distributed among the years in the following way (year: number): 2008: 2, 2009: 1, 2010: 2, 2011: 9, 2012: 14, 2013: 5. Number of papers published 2008-2010 on Cloud Sourcing were evenly low in the IS field. This was followed by a boom in 2011, and then it increased almost to the double in 2012. The upcoming year 2013 shows a remarkable decrease in published Cloud Sourcing papers in the IS field. This decrease is believed to be temporary due to a shift in the Cloud Sourcing debate, which most likely will be followed by an increase again. A follow up search indicates that this is the case, however, in this specific paper we focus on the years 2008 – 2013, as the first 5 years in which Cloud Sourcing has been discussed.

The 33 papers were categorized in seven different topics, which resemble the main discussion in the presented papers and their contribution. The seven categories are as follows: cost, benefits/risks, strategies, capabilities, research, IS development and other. In table 1 we illustrate the categorization of the 33 papers found in the top IS conferences and IS journals that matched the search criteria.

Analyzing the areas and description gained from the identified literature, we can conclude that published papers have a focus on cloud adoption and different questions related to adoption. This is most likely expected if looking at Cloud Sourcing as a new phenomenon. Another highlighted area that seems common in relation to Cloud Sourcing is the question about contracts and security issues as well as strategies. This finding was also expected since literature as previously presented argues for the importance of this issue. However, one interesting finding that gives space for rethinking is that not much research seems to focus on the relationship between providers and customers despite the fact that this would be of high interest in the Cloud Sourcing area, and specifically when comparing it to traditional information systems development outsourcing were this is one of the key issues for successful outsourcing. This goes in line with what Hirschheim and Lacity [10] describe as an area which shows lack of research on and they suggest more studies to be done in specific on the relationship between provides and customers in Cloud Sourcing of ISD. The first finding is actually surprising and an unexpected result is that we actually found more papers in the journals than among the conference proceedings (13 conference papers and 20 journal papers). It is surprising primarily because, it could be suggested that a new phenomenon first shows up among conference papers and secondly, it could be suggested that publications in journals takes longer time to get published. However, one explanation could be that the journal papers discuss Cloud Sourcing as something related to outsourcing and that the conference papers discuss Cloud Sourcing from a more practical viewpoint. It is found that the journal papers have a much stronger focus on outsourcing. The fact is that the major part talks about open source which could be seen as a starting point of the Cloud Sourcing phenomenon. However, only two papers specifically mention Cloud Sourcing and one of the two papers suggests a framework for doing research on Cloud Sourcing. So, this indicates that research on Cloud Sourcing is in its infancy and we could predict but also suggest that more research especially in the direction of how Cloud Sourcing is related to IT outsourcing would be needed.

In order to get a better grasp of the analyzed papers discussion on Cloud Computing and in specific Cloud Sourcing we have categorized them into seven categories based on their topics. We found that the most common topic of Cloud Sourcing is within Strategy – were we found papers from 2008-2013 and mostly being published in journals. Second most common topic was benefits and risks with papers from 2011-2013 and most papers published in conferences. Third place shares topics on capabilities (most papers published in conferences from 2011-2013, research (all papers published in journals from 2011-2012) and IS development (all papers published in journals from 2008-2013). The topic of cost was unexpectedly on fourth place with only two published papers 2010-2013. Cost was expected to be a highly relevant topic in Cloud Sourcing as one of the main motives behind Cloud Sourcing adoption. A recent follow up search after papers gave a couple of articles; however, only 2 of them were added into Table 1, both of them is basically a call for more research on Cloud Sourcing.

Table 1 Description of the 33 papers on Cloud Sourcing

Category	Year	Area	Short Description	Authors	Source
Cost	2010	Cloud BI	Reducing cost of BI through the Cloud	[22]	PACIS
	2013	IT outsourcing	Study on relation between IT outsourcing and decrease in IT operating costs	[23]	MIS Quarterly
Benefits/risks	2011	Open Source Software in small to medium sized enterprises	Evaluation of benefits and challenges of OSS	[24]	European Journal of Information Systems
	2011	Options in Application Software selection	Comparison of Open source and traditional software development	[25]	European Journal of Information Systems
	2011	Cloud Adoption	Cloud Adoption, benefits and risks	[26]	ECIS
	2011	IT outsourcing and Cloud Computing	Taxonomy development for IT risk management	[27]	ECIS
	2012	Cloud Sourcing security risks	Percieved IT security risks in outsourcing through the cloud	[28]	ECIS
	2012	IT events and CAPM outsourcing	Limitations around announcement periods of CAPM on IT events	[29]	PACIS
	2013	Cloud Sourcing strategy	Cloud Adoption, benefits and risks as well as related strategies	[16]	AMCIS
Strategies	2008	Middlemen in Offshoring	How to facilitate offshoring obstacles	[30]	Journal of Information Technology
	2009	Cojoint analysis of IT outsourcing and decision	The complexity of outsourcing and the motivation behind the decision	[31]	Journal of the Association for Information Systems
	2011	Institutional logics and IT management	Disentanglement from constraints of institutional environment in IT outsourcing	[32]	European Journal of Information Systems
	2011	Collective agility	Systems development in a global collaborative community	[33]	Information Systems Journal
	2012	Innovation diffusion and IT strategy	Cloud Computing changes the IT strategies for SME's	[34]	ICIS
	2012	Contractual governance and IT outsourcing	The role of IT in IT governance outsourcing	[35]	ICIS
	2012	Cloud Computing at universities	Cloud Adoption and the driving force behind	[36]	PACIS
	2012	Value creation and value capture from open source software	Network collaboration and governance to create and keep value	[37]	European Journal of Information Systems
	2012	Challenges of Open Source Software	Lock in customers strategy in proprietary software	[38]	Information Systems Research
	2012	Cloud Computing and CIO	Cloud Computing helping and CIOs to focus on strategic value	[39]	Journal of Strategic Information Systems
	2013	IT outsourcing	Chinese IT service suppliers expanding to new markets globally exploiting new opportunities	[40]	MIS Quarterly

Table 2 Description of the 33 papers on Cloud Sourcing (cont.)

Category	Year	Area	Short Description	Authors	Source
Capabilities	2011	IT capabilities	IT capabilities and IT resources affecting business processes	[41]	Journal of the Association for Information Systems
	2012	Crowdsourcing and capabilities	Capabilities development for facilitated Crowdsourcing	[42]	ICIS
	2013	Capability development through sourcing	Attaining new capabilities through IT sourcing	[43]	ECIS
Research	2011	Opening up the IS as a discipline	Opening up the IS field a commentary on IS research methods	[44]	Journal of Information Technology
	2012	Cloud Computing	Framework on Cloud Computing research - a review of theory and practice	[45]	Journal of Information Technology
	2012	Future and identity of Strategic Information Systems	A longitudinal review of SIS research	[46]	Journal of Strategic Information Systems
	2016	Future directions of sourcing	A literature review of sourcing and future directions	[47]	Journal of Information Technology
	2014	Looking at cloud computing as an emerging form of IT/IS outsourcing	A literature review of cloud computing research in relation to traditional IT outsourcing	[48]	Journal of Information Technology
IS Development	2008	Offshoring intermediaries	Bridging gaps between vendor and client	[49]	Journal of Information Technology
	2010	Coordination of Open Source Software development	Studying the Core-periphery movements in Open Source Projects	[50]	Journal of Information Technology Theory and Application
	2013	Cloud Computing migration theory	End-user migration from client-hosted computing to cloud computing	[51]	European Journal of Information Systems
Other	2012	Intersection of CSR and Global Information Technology Outsourcing	Outsourcing relationships and the importance of CSR	[52]	PACIS
	2012	Compliance between research and practice on the topic of outsourcing	The trends of outsourcing in practice	[53]	PACIS
	2011	Generation of business value from information services	Customer satisfaction predicted by information analyses of information services	[54]	European Journal of Information Systems
	2012	E-government initiatives and service providers	Service sourcing in E-governments and theoretical planning	[55]	Information Systems Journal

#### 4. Discussion of Cloud Sourcing as the next generation of Outsourcing and suggestions for future research

Following from the literature review on Cloud Sourcing in top IS conferences and top IS journals (AIS) there is to some extent a discussion and statement about Cloud Sourcing being the next generation of outsourcing. Albeit, it can be concluded that it ends as an empty statement with no well-grounded evidences. No studies have been found, in the searched databases, only dedicated to this provoking statement and perhaps obsolete paradigm shift. Cloud Sourcing is barely mentioned and focus is instead shifted on capabilities, resources, processes entailing outsourcing, adoption of cloud computing etc. By only mentioning Cloud Sourcing and stating its future impact in the reviewed papers, the authors overlook the deeper problem of the lack of evidence for its claim. More recent papers extend to include other aspects outside of the security, risk and adoption issues [47, 48, 56-60] which are opening up for broader discussions on the topic. Still the topic is lacking in evidence based research.

As literature shows that cost reduction, flexibility and access to talent are the motives for outsourcing [61], and literature also claims that Cloud Sourcing could increase the benefits of the factors for motivation. It is puzzling that no research has been done on this topic which at first glance might seem researched, but on closer inspection reveals to be lacking in depth. If Cloud Sourcing is predicted to create an evolutionary shift in outsourcing of IT, then why is this evolutionary statement with a great impact not justified through research and with empirical evidence? Of course, many will probably disagree with this assertion that what is discussed in practice on Cloud Sourcing is still not captured by the academic world in published papers. But the growth of Cloud Sourcing as a field is real and, arguably, might be the most significant factor in the historical development of outsourcing. Whereas the literature review of this paper provides ample evidence that there is a lack of research on Cloud Sourcing that supports the statement made on its significance for an outsourcing evolution, Gartner [18] and Muller [11] convinces us that this is an area to catch up on in academic research. This research would be fruitful to both practitioners and academics bridging the gap and formalizing Cloud Sourcing especially in the fields of transaction cost economics, resource dependency theory, and knowledge management as it would offer a novel phenomena and give good grounds for critique of traditional outsourcing. Limitations of our study regard mainly the uneven amount of papers studied and compared between selected journals and conferences which might at first thought appear to affect the results negatively. Although, we have delimited our study to specific sources of material in which we have used the papers that exist – and as such under those conditions we believe to have covered what was available with regards to amount of papers and their distribution.

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**Biographical notes****Björn Johansson**

Associate professor in information systems at School of Economics and Management, Lund University, Sweden. He received his PhD in Information Systems Development from the Department of Management & Engineering at Linköping University, Sweden in 2007. Previously he worked as a Post Doc at Center for Applied ICT at Copenhagen Business School, involved in the 3rd Generation Enterprise Resource Planning - Strategic Software for Increased Globalization (3gERP.org) research project funded by the Danish National Advanced Technology Foundation. He is a member of the IFIP Working Groups IFIP 8.6 and IFIP 8.9., and the Swedish National Research School Management and IT (MIT).

*[www.shortbio.org/bjorn.johansson@ics.lu.se](http://www.shortbio.org/bjorn.johansson@ics.lu.se)*

**Mirella Muhic**

Mirella Muhic has a M.Sc., and B.Sc., in Information Systems, as well as a B.Sc., in Business and Economics, Major: Marketing Management. Currently she works at the Department of Informatics as a PhD student, but also course coordinator and lecturer at Lund University School of Economics and Management, field of IT and Strategic Management. Muhic teaches both on undergraduate and graduate level. The area of research interest is in IT-strategies and the increase in company flexibility through sourcing of IS-development. Muhic is a PhD candidate member of the Swedish National Research School Management and IT (MIT).

*[www.shortbio.org/mirella.muic@ics.lu.se](http://www.shortbio.org/mirella.muic@ics.lu.se)*