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ncerpa@utalca.cl

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Special Issue on Cloud Computing and Electronic Commerce: Guest Editors' Introduction

Harry Bouwman¹ and Narciso Cerpa²
Editors

¹*Delft University of Technology, Faculty of Technology, Policy and Management, the Netherlands,*

w.a.g.a.bouwman@tudelft.nl

²*Universidad de Talca, Faculty of Engineering, Chile*

ncerpa@utalca.cl

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Cloud Computing

Cloud computing has been on the agenda of many CIOs (Chief-Information Officers) for the last couple of years. At the same time academic research on cloud computing is slowly emerging. Although mainly Information Technology (IT) operations related, cloud computing is also relevant from an electronic commerce (and electronic business) perspective. Research around cloud computing is becoming more and more prominent, moving from a more technology oriented focus to potential applicability in business domains.

Cloud computing is based on similar principals as when the first mainframes were used by academia and corporation, i.e. timesharing. At that time thin clients had access to mainframes, most of the time, on local premises. Since then the world of IT has evolved quickly, and mainly due to the emergence of the Internet and electronic commerce, concepts like utility computing, grid computing, and ideas like the network is the computer became common, resulting in the concepts of cloud computing. Amazon played a key role in developing cloud computing concepts. Amazon analysed that their data centers were using about 10% of their capacity in day-to-day operations only to be prepared for occasional often even seasonal spikes in their operations. Flexibility and efficiency were, and still are key drivers for introducing cloud computing.

In 2006 Amazon started to offer their Amazon Web Services as a commercial product to third parties, since then developments went fast Infrastructure as a Service (IaaS), Platforms as a Service (PaaS), Software as a Service (SaaS), Data as a Service (DaaS) and nowadays almost Everything as a Service (XaaS) are being offered, either in a public, private, community or hybrid cloud. Common elements of cloud computing are related to virtualization and variety of Resources, shared resource pooling, scalability/rapid elasticity, convenience in use and access, network enabled, SLA's (Service Level Agreement; measured services) and pay per use revenue model. None of the common elements explicitly refer to a specific type of technology. The common elements instead appear to refer to the conditions under which cloud computing resources are acquired (network access, pay-per-use, SLA's, convenience) and the properties of the resources acquired with cloud computing (virtualized, varied, shared, scalable). Cloud Computing is therefore more a paradigm or a paradigm shift in computing. Virtualization is an enabler of this paradigm. Virtualization is a technique which hides the physical characteristics of computing resources from the way in which other systems, applications or end users interact with those resources. Virtualization of both hardware (data, storage, memory, processors, network) and software is possible, as expressed in the different XaaS acronyms.

Papers in this Special Issue

Although a lot of attention is paid to the conceptual background of cloud computing, as well as to the technologies involved. Initially focus on research, next to technology issues, security and privacy, and the ecological relevance of cloud computing, was on the business case of cloud computing: who would be the most likely parties to gain from this new paradigm? However research on cloud computing and electronic commerce is still scarce. With this special issue JTAER wants to put the relevance of cloud computing for electronic commerce on the research agenda. Questions we raised in the call for papers for this special issue related to how is network access to computing, online storage, software, processing, interdependency of access device, web browser access, pay per use, and scalability capacity going to imply for electronic commerce applications? Do changes in cloud architecture have an impact? What are the trade-offs with regard to deployment models such as public, private, hybrid or community clouds, seen the perspective of electronic commerce? Which infrastructure and cloud software services, related to storage, computing capacity, and service management, file storage, appliances, and cloud management impact electronic-commerce? Which generic platform services are relevant to electronic commerce cloud computing for instance with regard to business intelligence and integrations of applications? And finally what SaaS solutions, such as billing, financial services, legal, sales, content management, CRM (Customer Relationship Management) or social networks are attractive to be integrated in electronic commerce? What are the legal and practical constraints? What is the vulnerability of cloud computer systems in relation to electronic commerce activities?

We received a large number of papers based on the call. After reviews and revisions we selected five papers that touch on five different aspects of cloud computing and electronic commerce.

The first paper of Lior Fink positions cloud computing in relation to electronic commerce analyses on a conceptual level making use of transaction economics, what the role can be of cloud computing in moving from electronic hierarchies to electronic markets. Fink introduces the concepts of Electronic Relational Hybrids and Electronic Recurrent Hybrids as intermediary steps, deepening and specifying the networked governance concept as introduced by Powell in the 1990 paper *Neither Markets nor Hierarchy: Networked forms of Organization*.

The second paper by Baghdadi focuses on the role of cloud computing in offering and enabling what the author labels as Social Commerce. The paper propose a technical architecture to enable social interaction in a B2B setting. Social commerce relates to the use of social media and interaction to assist in the online buying and selling of products and services. The paper discusses how to combine social media functionality with cloud computing and Service Oriented Architecture principals in an enabling architecture for an Enterprise Social Interaction Manager.

The third paper by Boillat and Legner focuses on the impact of the cloud computing paradigm on Software Vendors Business Models. Based on case studies of alternative software offers by Salesforce, SAP, Oracle, and Netsuite, it becomes clear that all Business Model components are affected. However alternative business models open opportunities for new revenue streams, based on platforms concepts.

The last two papers discuss broader and more traditional cloud computing issues, i.e. Risks and the ecological relevance of cloud computing. Roger Clarke discusses the risks for data security evasion, i.e. data loss, data theft, data inaccessibility, unauthorized modification, access and replication, as well as the consequences for data-owners. He proposes some counter measures, e.g. technical, organizational, and legal. Clarke concludes that these safeguards are seldomly implemented and therefore users, companies and consumers alike have to be far more careful in making use of making use of cloud computing facilities in which data is stored in the cloud.

The paper by Makela and Luukkainen stress the relevance of cloud computing for achieving green ICT objectives. Although the demands for cloud computing are more driven by efficiency motives than ecological considerations, vendors can play an active role in promoting the green nature of cloud computing. Based on three cases they suggest all kind of actions that would make cloud computing energy efficient and greener. They plea for specific green SLAs and urge cloud computing clients to ask for these kinds of SLAs.

With this set of papers that touch on different aspects of cloud computing, and the potential relevance for electronic commerce, not only from an economic perspective but also more from other societal values such as security and ecological values we hope to contribute to a research agenda. However we still believe that a research agenda on cloud computing and electronic commerce can be further developed. As editors we hope that the attention for research on cloud computing and electronic commerce will be increased and JTAER wants to play a role in further development of a research agenda on this topic.