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Global perspectives on accounting information systems: mobile and cloud approach

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Abstract

Cloud computing and mobile applications today are no longer buzzwords, but important resources in the business strategies of companies. More and more SMEs have adopted and currently are using cloud computing and mobile technologies. Big companies developed their own big data centers, private cloud or hybrid cloud as a support for their processes within the shared services architecture. Since Accounting Information Systems (AIS) process and store a series of sensitive and confidential data (general ledger, payroll database, and financial database), cloud and mobile technology adoption requires a rigorous analysis of data and application security. In this paper, based on a quantitative research of existing literature and specialized practice, we wish to synthesize the potential of cloud and mobile technologies in the AIS. We also provided a SWOT analysis of these technologies in the context of AIS.

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1. Introduction

Current development and usage of IT&C within organizations has a major impact on Accounting Information Systems. More and more small and medium business companies have adopted and currently are using cloud computing and mobile technologies [5]. Large companies developed their own big data centers, private cloud [3] or hybrid cloud [3] as a support for their processes within the shared services architecture. The shared services approach has a significant and direct impact on the company's financial and accounting processes.

Looking from the global perspective, business development is accomplished through the extensive use of internet and mobile and cloud technologies. In terms of technology and cloud services, this new approach has led to a new business model paradigm, namely the cloud business model paradigm. This paradigm significantly impacts the business strategies of companies, the way companies do business and define the hardware, software and communication infrastructures, risk management and cost management.

The best known and most widely used cloud services in the new business models are: Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Business Process-as-a-Service (BPaaS) [4]; [9]; [12]; [13]; [15]; [16]; [17]. Also, a series of studies highlight the role of cloud technologies in the financial and accounting processes within companies. There is a constant increase in scientific literature and practice of the following terms: "Tax in the cloud" [11], "Finance & Accounting in the Cloud" [10].

Regarding the impact of mobile technologies and applications on business processes of companies, we can mention their use in Mobile Payments [13], Automatic Documents Entry, Mobile Customer Service, and Mobile Accounting Service [2].

Considering the role and architecture of AIS [2] we can observe that cloud and mobile technologies significantly influence AIS both from within the organization as well as from the outside.

Taking into account the multiple implications of cloud and mobile technologies on today's business process, we want to conduct a research regarding on how these technologies can be used in Accounting Information Systems (AIS) in order to improve the accuracy, completeness, and timelessness of accounting information.

In the same time we want to analyze the determinant factors of implementing cloud and mobile technologies in the AIS.

In this paper, based on a quantitative research of existing literature and specialized practice, we wish to synthesize the potential of cloud and mobile technologies in the AIS. We also provided a SWOT analysis of these technologies in the context of AIS.

2. Literature Review

In their study, Gupta, Seetharaman and Raj [5] focus on the perceived inclination of micro and small businesses toward cloud computing and present five factors that influence the usage of cloud computing by SMEs and SMBs: ease of use, security, cost reduction, reliability and sharing and collaboration.

Cloud computing can facilitate software engineering activities through the use of computational, storage and other resources over the network [14].

Cloud computing services generally refer to either or a combination of the following [3]; [4]; [9]:

- IT Infrastructure as a service (IaaS): Infrastructure vendors provide physical storage space, processing capabilities, virtual CPUs and database services.
- Platform as a service (PaaS): A set of software and product development tools for development, testing, deployment, hosting and application maintenance hosted on the provider's infrastructure. Software developers can create applications on the provider's platform through the Internet.
- Software as a service (SaaS): The end-user (private user or business user) pays the software provider a subscription fee for the service and the software is hosted directly from the software providers' servers and is accessed by the end user through the Internet.

Dinh et al. [4] offer an overview of mobile cloud computing (MCC) through a survey regarding the architecture, the applications and the approaches of MCC. Mobile cloud computing overcomes problems related to performance, environment and security. Dinh et al. [4] also emphasize certain issues (disadvantages) of mobile cloud computing

like: low bandwidth, poor network access management, poor quality of service, high pricing, interfacing and service convergence.

In a benchmark study conducted by the Cloud Accounting Institute [1], the most widely deployed cloud solution areas currently are Accounting/Financial Management. Among managers with plans to acquire SaaS solutions, 74% pointed to Accounting/Financial Management software solutions.

The top three expected benefits from adopting Software as a Service (SaaS) solutions are [1]: simplifying software management, reducing capital and/or operating costs, and speedy implementation.

The top concerns regarding a SaaS solution implementation are [1]: security concerns, integration challenges with other applications, total cost concerns, and application performance.

The main benefits of integrating cloud solutions are [1]: a “single version of the truth” for improved management decision-making, reducing duplicate data entry and real-time reporting.

3. Research Methodology

Research problem. The central problem of this study is “What is the impact and global perspectives of cloud and mobile technologies usage in the Accounting Information Systems”.

Research design. The research is exploratory and it is based on documentary study. We discussed the main issues regarding the use of cloud and mobile technologies in the Accounting Information Systems. Our findings were structured on: (1) Technology impact and perspectives; (2) Risk and security impact and perspectives; (3) Accounting and financial impact and perspectives; (4) Business strategy impact and perspectives.

We made a SWOT analysis on the impact of cloud computing and mobile technologies on Accounting Information Systems.

Sample, population or subjects. The sample consists of a most relevant papers and studies about cloud and mobile technologies usage in business.

Research model. The conceptual model of our research is presented in Fig. 1.

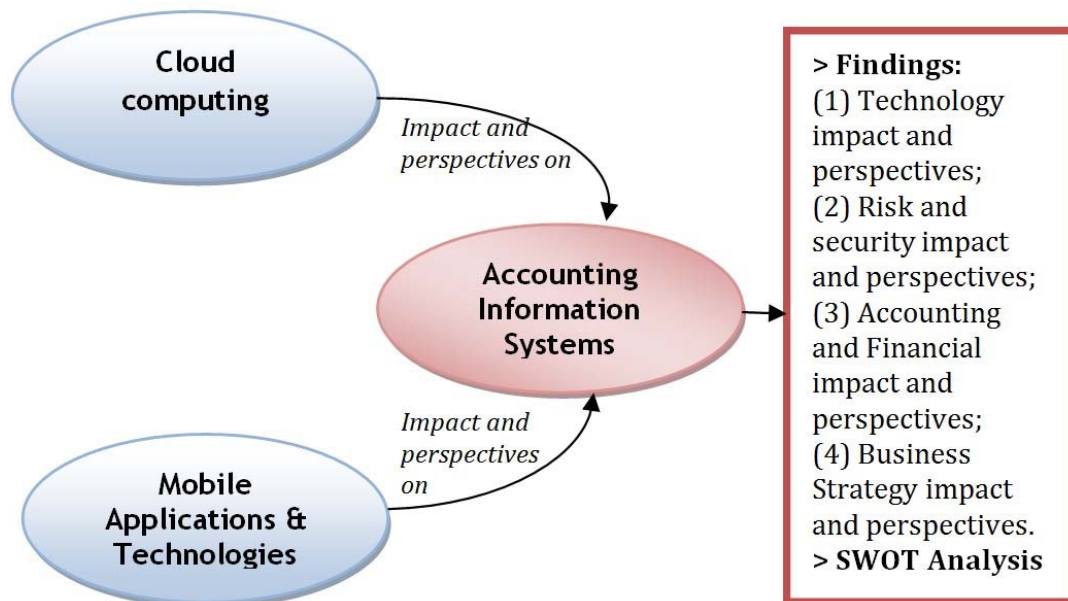


Fig. 1. The research model.

4. Findings and Discussions

The results of this research are grouped into two parts. In the first part we will discuss the impact and perspectives of using cloud and mobile technologies in the AIS. In the second part we present a SWOT analysis of the impact of cloud and mobile technologies on AIS.

4.1. The impact and perspectives of using cloud computing and mobile technologies in AIS

In our research we have identified the following categories of perspectives and areas of impact: (1) Technology impact and perspectives, (2) Risk and security impact and perspectives, (3) Accounting and Financial impact and perspectives, (4) Business Strategy and impact perspectives.

- (1) **Technology impact and perspectives** [3]; [4]; [9]; [10]; [11]. From this point of view we have the following:
- Using SaaS solutions for implementation and delivery of ERP (Enterprise Resource Planning) solutions within the AIS represents the most significant impact. In the context of a SaaS model, companies rent an ERP solution, so most transactions and reports from AIS are hosted in the cloud infrastructure. The big companies use the SaaS model for providing ERP services within the shared services architecture of the company. The impact on AIS involves both the hardware and the software. Here are some examples: SAP, Netsuite, Oracle ERP Cloud Services, Microsoft Dynamics ERP cloud-based, etc.
 - Using PaaS in the AIS for developing custom modules and applications on financial processes, accounting, marketing, HR, etc. (e.g. SAP HANA Cloud Platform). If SaaS allows just providing standardized ERP solutions in AIS, PaaS enables extending and customizing these solutions through the tools of the development platform.
 - Using IaaS in the AIS allows the installation of database servers and back-up solutions in a cloud infrastructure. IaaS provides large storage capacity and data processing of financial information.
 - Using Mobile Applications and Technologies in the AIS allows extending client applications in basic financial and accounting processes of the company. Mobile payment systems and mobile systems for capturing data in documents have the most significant impact on AIS.

In perspective, cloud technologies can create an integrated environment in which Accounting Information Systems of various companies that are in the same cloud and use the same ERP can interact easier and faster in EDI (Electronic Data Interchange). Likewise, the mobile applications and technologies can be used in the AIS as mobile terminals for primary data collection, data entry, and accounting and financial transactions.

(2) **Risk and security impact and perspectives** [7]; [8]. In most studies, the problem of risk and security of cloud and mobile technologies is critical. Although some authors consider that migration to cloud represents a security improvement, many risks and security problems still remain. Most cloud service providers often implement powerful security solutions that for many companies turning to cloud services lead to an increase in security [12]; [13]. Regarding concerns over cloud and mobile security services, in our research we have identified the following risks and security issues with a significant impact on the AIS:

- Financial and Accounting Data Loss [8]; [10]; [11]. Processed and stored data in AIS are vital for the company (for example general ledger, payroll database and sales database). They are the basis for all reporting and analysis of the company. Storing data and information in an infrastructure outside of the company (SaaS or IaaS) has the effect of increasing the risk of loss of that data. The company owns only the data not the infrastructure offered by the cloud service and cannot control or verify the storage and data processing systems.
- Privacy [8]; [10]; [11]. Privacy is the most common concern when it comes to cloud technology implementation in the AIS of a company. The Accounting Information System processes and stores sensitive data and confidential information, like employee data, customer data and financial data of the company.
- System availability and business continuity [8]; [10]; [11]. Regarding this issue, most concerns are about communication interruptions or mobile/cloud infrastructure and recovery for business continuity.
- Legal and regulatory concerns [12].
- Intellectual property theft [12].

The perspectives of enhancing AIS security by introducing cloud technology that we have identified are:

- Patch management [7]; [8]. Having a centralized and unitary structure, applications or infrastructure patches management are more effective and in short time.
- Disaster recovery and backup procedures [7]; [8]. Cloud Service Providers (CSPs) have mostly advanced backup and data recovery implemented solutions.
- Permanent supervision and security administration [7]; [8]. CSP departments and teams deal exclusively of ensuring infrastructure security.

In perspective, regarding cloud and mobile security, an important role is attributed to insurance services through IT auditing. IT audit services of cloud infrastructure will represent a mandatory requirement for adoption of these technologies in the AIS of a company. In this context, the continuous auditing of cloud technologies will be of high importance.

(3) **Accounting and financial impact and perspectives** [12]; [13]. Using cloud technologies in the AIS has a positive impact by significantly reducing acquisition costs, maintenance and management of hardware and software infrastructure of the company. Likewise, the tax implications of cloud adoption play an important role in the cloud decision-making process [12]; [13]. A financial characteristic of investing in implementing cloud and mobile technologies in the AIS is the high rate of ROI. A positive financial impact of adopting cloud services is the one on the company’s cash flows by reducing payments for purchases of hardware and software (ERP and others). Cloud services are pay-per-usage and they are used by paying rent monthly or yearly.

(4) **Business strategy impact and perspectives** [9]; [6]; [16]. Using cloud and mobile technologies within companies has a significant impact on the company's business strategy as well. These technologies reshape the way in which companies make business. For most of the big companies, using cloud or hybrid cloud-based technologies involves organizing business based on the shared services architecture. Thus, the company becomes more flexible in support processes for doing business. Another impact on the business strategy is the use and development of outsourcing services in every company’s business strategy. In perspective, we can highlight the increased role of the cloud business model in the business strategy.

4.2. SWOT Analysis of cloud computing and mobile technologies impact on AISs.

Table 1. SWOT Analysis of cloud computing and mobile technologies impact on AIS.

Technologies	Impact on AIS			
	Strengths	Weaknesses	Opportunities	Threats
Cloud computing and Mobile Applications	Scalability	Service Agreement (Contract)	ERP-SaaS	Accounting and financial data loss
	Costs reduction	Internet connection	Mobile automated	Privacy breaches
	Collaborative environment (with customers, employees)	A lack of standards between cloud providers (inter-operability) [12]	Accounting (documents) data gathering	Systems Availability
	Global approach (without borders)	Integration with existing architecture [12]	Mobility	Dissatisfaction with offerings/ performance/ pricing from vendors
	Data back-up and recovery	Data migration [15]; [16]	Security Improvement	Legal and regulatory

5. Conclusions

In the context of mobile and cloud technology development, more and more companies adopt such technologies as infrastructure support for their activities. Migration to these technologies has a significant impact on the AIS as well. Through our research, we have tried to identify and present the main areas of impact in using cloud and mobile technologies on AIS. Most papers and studies that we have reviewed highlight the positive role of using cloud and mobile technologies in business development. For AIS, these technologies provide scalability, mobility and reduced

maintenance costs. Since AIS process and store a series of sensitive and confidential data (general ledger, payroll database, and financial database), cloud and mobile technology adoption requires a rigorous analysis of data and application security. Therefore, we wish to emphasize the important role of IT audit services on mobile cloud technologies. These solutions will be used more and more both in SME as well as in Big Companies mainly due to the low cost and high scalability considering stable and permanent Internet connections. From a global perspective, AIS development using cloud and mobile technologies will lead to a reorganization of the business architecture with significant impact on business strategy.

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