

How cloud accounting and integrated services based on AI can impact accounting companies?

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Abstract. *Artificial intelligence solutions are not present only in big companies, but the new trend is to start changing the accounting profession also in small and medium companies. In order to shorten the period in which they will have access to artificial intelligence solutions, the artificial intelligence needs to be offered in a more accessible form. This paper represents the first step in a more in depth research about the way available resources for an organization to implement artificial intelligence solutions in their financial departments. This decision has the potential to bring fundamental changes to accounting and auditing, and in the entire financial markets. This paper explores the potential of artificial solutions adaptation in accounting, identifying the steps already taken in this field of activity which will help them to implement further changes. We investigate mainly the organizational changes brought by cloud computing and its potential for the accounting field to adapt to further technological solutions. We assessed the cloud computing's effect on the accounting profession, and the potential role of these professions in further implementing more intelligent solutions, as well as the main advantages and disadvantages in order to understand the reasons for high interest in migration to cloud computing, especially during the COVID-19 crisis.*

Keywords: cloud accounting, software as a service, artificial intelligence, accounting, finance

Introduction

The business reality has rapidly changed, and the executives are struggling to keep up with the new challenges, to survive and even to grow while keeping employees motivated and customers satisfied with the services and offered products.

The accounting profession was challenged as well but in this period it has been better understood the importance of this profession, because its role is not to analyze the past results anymore but to support the business executives to forecast information and better ground decision making process. From the decision of offering bonuses to cutting some positions in the company or “closing the doors” for a period, the accounting experts needed to supply management with relevant information.

Artificial Intelligence (AI) solutions are changing the accounting profession not only in the big companies. Now the accounting AI technology started to be applied also in the small and medium-sized enterprises (SMEs). The application of this technology in accounting offers an opportunity for the professionals to remodel their activity and practices and to be able to offer increased and relevant services. (ACCA report, 2020)

This study is willing to better clarify the impact of AI solutions on the accounting profession and we started this process by making some assumptions based on the available information on the literature.

H0: The accounting companies who already implemented cloud computing and other digitalization solutions are more inclined to implement AI solutions.

H1: The AI solutions will impact the accounting professionals whose job description contains repetitive tasks.

H2: All the accountants need to adapt their current role once the AI solutions will be implemented in their companies.

H3: The Covid-19 crisis forced the accounting companies to integrate technology in their normal activities.

H4: The AI solutions will be implemented in the short term by big companies which dispose of the necessary resources.

H5: Companies which already implemented AI solutions have seen the changes by measuring some specific key performance indicators (KPI).

H6: The data provided by AI solutions has a lower level of errors and should be trusted more than the data resulted from manual work.

Literature review

Accounting profession evolution

In order to respond to the new challenges faced by companies in the technological evolution, and looking at the needed competencies for an accountant, the International Federation of Accountants (IFAC) describes the evolution of the accounting profession over time on the following scenarios:

- a) *the accountants which are doing only repetitive activities in the same way* (collecting, extracting and administrating the data, reconciliation of information delivered by different systems and utilization of limitative information in the process of decision making);
- b) *the accountants which are doing repetitive activities but in a different way* (utilization of automatization and communication technologies based on personal exploration and an individual decision to learn new skills);
- c) *the accountants, which are doing different things* (derived from present activities that require requalification and perfectionism, having a focus on relevant competencies, including business competencies, emotional and comportamental intelligence, digital skills, data integration, synthesis, analysis and communication skills)(Sova et al., 2020)

The challenges faced by organizations during the COVID-19 crises

From a social point of view employees had to change their way of working while transitioning to the teleworking model and sharing their space with relatives, sometimes with one or more children. In this way their homes became a hybrid space, where office work and domestic tasks were shared. In the pandemic context many people were at risk of having their salaries cut or even losing their jobs. (Riley, 2020)

This crisis transformed the social and labor reality not only by accelerating the digitization transformation but also by making a social division. Not all companies and people were able to face this challenge, due to their lack of resources necessary to invest while coping with the changes. (Milanesi, 2020) National Statistics Institute has data which confirms this and also adds the storage and transport sector to the list of affected sectors during this recent crisis. Instead, the less affected sectors were represented by food, footwear and clothing. Also, there was an increasing demand for technological goods. (Almeida, 2020)

The challenges faced by the accounting departments during the COVID-19 crises

Covid-19 has changed the way accountants all over the world are practicing their jobs every day and at the core of this change was technology.

Due to technology many companies and even industries were able to continue their activity remotely, even if they did not foresee this warning of the transition.

The technology decisions taken for accounting companies had the following drivers: the need for a remote collaboration, sustaining the visibility on work and tasks, integration across multiple systems, internal communication and with clients.

Even if after this crisis some work habits will return to the reality pre-COVID, technology adoption has already reshaped the accounting sector and will continue to do this.

Some solutions that technology provided for accounting companies during COVID crisis are the following: the need to increase cloud migration; accountants' new set of skills and the increased demand for integrated accounting platforms.

Cloud computing

First time when the term cloud computing was used was in 2008, defining a solution to store data from different devices, located in different locations. Cloud computing represents the offer of hardware and software applications in the form of service using the Internet. (Buyya et al., 2008).

After a period in which cloud computing started to be adopted in different departments of the companies it also started to be adopted in the accounting activities. Several studies about the features of cloud computing adoption were conducted for better understanding costs, benefits, privacy issues and advanced security, reasonableness with technology and possible measures for security issues. (Sharma, 2018) Even if there was a noticeable interest on the impact of cloud computing adoption into the business, the area where there are less studies is represented by cloud accounting. (Brandasa et al., 2015), (Mangiuc, 2014)

Cloud accounting represents storing and processing the accounting information on the software of Internet-based cloud supplies's applications. In this way the accounting information and software are located on a remote server from which an enormous number of clients can have access at the same time from different devices. Cloud accounting presents a significant benefit for the business, as compared to traditional accounting, in case it uses the software as a service (SaaS). (Christauskas et al., 2012) In this case the software and necessary assistance are being offered by the cloud supplier in comparison to the need of introducing the software on the client's computer. (Dimitriu et al., 2015) (Ionescu et al. 2021)

There are four types of cloud computing:

Public cloud - temporarily used by the public which is less safe due to the high number of people who access it and requires a huge investment, and this is the reason it is offered by Microsoft, Google or Amazon.

Community cloud - which is designed for various organizations or groups of individuals.

Private cloud - infrastructure operated only by one organization.

Hybrid cloud - which represents a combination of the aforementioned types of cloud. (Brandasa et al. 2015).

Cloud computing uses a service oriented business model based upon the following options:

IT Infrastructure as a service (IaaS): In this case infrastructure vendors provide physical storage space, virtual CPUS, processing capabilities, and database services.

Platform as a service (PaaS): In this case a cloud provider hosts on his own infrastructure a set of software and product development tools for development, deployment, testing, hosting and

also application maintenance. Software developers have the possibility to create applications on the provider's platform using the Internet.(Cutting at al., 2021)

Software as a service (SaaS): In this case the end-user (could be a private user or business user) chooses to pay the software provider a subscription fee to use the service and the software which is hosted directly on the software providers' servers and can be accessed by the end user through the Internet.(Christauskas et al., 2012)

Traditional accounting software

Before cloud computing started to exist the accounting softwares was desktop-based. As major drawbacks that can be mentioned there are: limited access to data, constant software updates needed, and an ongoing cost for the backup of all the financial information. It requires a major initial investment, treated as fixed costs. There is a need for an IT team for implementation and constant support. The major threat is a potential physical damage of equipment that may cause the loss of data. In the long run there are maintenance expenses and necessary investment and over time the equipment will diminish their value by depreciation. The business owners may face the disadvantage of losing the focus on the business. (Sharma, 2018)

Cloud accounting software

Cloud accounting known also as online accounting, presents the same functionality as desktop accounting but the entire process is moved to cloud. On the desktop there is no application and the employees log in directly to the online solution, which is always-up-to-date and the data is constantly and safely stored on the cloud server. Cloud accounting offers a clear picture of the costs, in the long run requiring a monthly payment, in case the contract conditions were very well negotiated. (Marand et al.,2013)

Cloud accounting is a type of cloud computing application with the specific purpose of processing financial data. It moves the installation, processing and data storage of the accounting systems and services from on-premise to the remote servers owned by cloud service providers.

Methodology

This study represents a preliminary phase in a more in depth research project addressing the implications of AI solutions for the financial sector. In this initial phase, our objective is to investigate the adoption of AI solutions from an organizational perspective and to identify its main opportunities and challenges for the accounting profession.

We have chosen, as a research approach, an extensive analysis of both scientific and business literature concerning organizational issues raised by AI solutions and cloud computing, as triggers for faster AI solution adaptation. Such an approach is motivated mainly by the current scarcity of organizational solutions or applications based on AI. Without data, any aspect related to AI solutions can't be empirically investigated. Both qualitative and quantitative research methods will offer enough data to better understand the current situation.

Primary data for this study will be provided through the administrations of a structured questionnaire on selected accountants. The targeted population is represented by the Romanian accountants and auditors which are working in companies having CAEN CODE 6920- Accounting activities and financial audit; consultation in the fiscal domain and a representative sample will consist of over 300 responses from financial specialists.

Before administering this questionnaire an interview will be conducted, with top accounting professionals, in order to understand the impact of AI in their organizations and on their employees

working in the financial department (i.e. accountants, auditors, financial analysts, finance managers, associates, cost analysts, controllers, budget analysts etc.)

In order to better design the structured questionnaire, the interview will be preliminarily conducted and valuable results are expected to be gathered. The current study aims to clarify different aspects related to challenges, opportunities, advantages, limitations, and possible solutions of AI's implementation, derived by cloud computing adoption, as perceived by both scientific and professional communities.

For this step some secondary data are used, that are provided by the following databases: Taylor, Elsevier and Emerald. We have selected 52 articles published in the last ten years, related to cloud computing in accounting.

Results and discussions

Cloud accounting provides the software which can be used via the internet and the client only buys the right to use it. Cloud accounting is modernizing the entire business environment, by the way accounting applications are used. The function of accounting related to traditional software was changed by cloud technology. (Rao et al., 2017)

Using cloud accounting the specific process will be quicker and more effective. It helps the employees to access in real-time the information, therefore it will generate an increase of the financial information transparency, through cloud platforms. But security and customer data protection are the main challenges while using cloud accounting, as it was mentioned in most of the papers related to cloud computing. (Dimitriu et al., 2015) (Khanom, 2017), (Kinkela, 2013) (Christauskas et al., 2012), (Marand et al., 2013) The main reason the security risk is mentioned so often is because of the unsecure wifi connection or unprotected information procedures that employees are accessing (Zhang et al., 2013), (Allahverdi, 2017)(Tarmidia et al., 2020)

Advantages of cloud accounting

- a) *Reduced capital expenditures.* When a business starts using cloud computing the initial investment necessary for the entire IT infrastructure will be saved and instead it will be replaced with smaller monthly payments. (Maa et al., 2021);
- b) *Maintain focus on the business.* Businesses decided that having an IT department does not represent their core competencies, being better doctors, lawyers or accountants. The decision to buy cloud services as a single application or an entire datacenter can be more cost effective and reliable and this will let them use their limited resources to grow their business. (Dimitriu et al., 2015); (Christauskas et al., 2012).
- c) *Business agility.* Businesses which invest a lot in technology can face the situation in which they cannot take advantage of opportunities on the market not having enough financial resources, employees or time they need to react. (Marand et al., 2013)
- d) *Scale.* In case of businesses which have peak season can benefit from the cloud providers by offering them temporarily more capacity. (Brandasa et al., 2015)
- e) *Access from anywhere.* The employees have the opportunity to work from anywhere there internet access is available and this will eliminate the need of being physically present at the office. (Andronie et al., 2019), (Yau-Yeung et al., 2020);
- f) *Remote access.* Using cloud accounting the employees can work from everywhere having access to the business key numbers 24/7. (Rao et al., 2017) , (Khanom, 2017);
- g) *Real-time information access.* Real-time reporting can be achieved by keeping up to date bank reconciliations and bookkeeping. A real time overview is necessary while looking at

- the company cash position, planning spending budget or making big financial or strategic decisions as a management team (Rindasu, 2017);
- h) *Staffing efficiency*. Cloud computing providers can outsource technology staff to support the business in case they need it (Khanom, 2017);
 - i) *High security standards*. It is easier for a cloud provider to assure security of the financial standards and also a secure sharing of data. In case of audit procedures, the employees do not need to attach sensitive information to emails but instead they can work in a cloud platform, in which third parties are allowed using an ID and password. (Al-Nsour et al., 2021).

Disadvantages of cloud accounting

When a company decides to migrate to cloud accounting it should also take into consideration its specific disadvantages (Marand et al., 2013). While working on cloud there is a need for constant internet connection, and one should be aware that it may working slowly, at a low speed (Christauskas et al., 2012). There is also a data security risk, in case employees connect at a unsecure Wifi network or they are working in a place where the information can be easily seen by unauthorized persons (Brandasa et al., 2015). It could be perceived as a loss of control over the company's data. (Khanom.,2017) As a threat could be mentioned the dissatisfaction with offerings, performance or pricing on the market. (Allahverdi, 2017)

Cloud accounting versus traditional accounting business suitability

Types of companies for which cloud accounting will be a better solution than traditional accounting are the following:

- a) *Companies with a small budget*, because it cost less to use cloud accounting instead of traditional accounting. In the beginning at least the company doesn't need to make big investments in the system, instead it will pay what it is used monthly. (Al-Nsour et al., 2021);
- b) *Businesses with teleworking*, because cloud computing will allow their employees to work from home, as long as they have internet access. In the current situation caused by the pandemic crisis this was a necessary solution because most of the companies were forced to change their business models (Sastararuji et al., 2021). The national regulations, which impose more space for employees so they will not spread the virus, changed the working environment. Companies decided to allow employees to work from home and only small groups to come to the office by rotation. (Andronie et al. 2019);
- c) *Small and medium companies*, which are not able to assure data security and in this case a cloud computing provider may offer a bigger data security. There is the case where employees need to send sensitive information via email as an attachment, working on cloud they will have the possibility to have access to a specific folder using an ID and a password and this will reduce the risks of exposing the data;
- d) *Companies with insecure physical space*, where there is the risk of physical damage of hard drives on which is the data stored, for example locations with a high risk of fire or flood. Also in case of remote work there is a potential risk of physical damage of the laptop as well (Khanom, 2017).

Beside all the advantages that cloud accounting provide, some businesses decide that the traditional accounting may be more suitable for them because of the following:

- a) *Companies need a tight control over their accounting data and they want to mitigate the risk of being accessed from places where there is a non-secure wireless network or in case they are not able to directly monitor the usage of data (Rao et al., 2017);*
- b) *Companies that have very sensitive data, for example banks, and they want to restrict third party's access. The only way it can be provided a complete control over the data security being to keep it in-house (Khanom, 2017);*

Accountants' new set of skills is a 'must' for companies willing to hire for different open positions in this current period. The accountants who are in the beginning of their career, who are more familiar with data analytics, can be more prepared to embrace the technology and to integrate it in their daily activities. They are exactly what companies are looking for nowadays in order to enhance the digitalization capabilities (Yau-Yeung et al., 2020).

The advantage is the fact that AI and machine learning (ML) offers accountants the necessary support to generate data-backed results that reduce processing time and errors.

The disadvantage is represented by the significant gap of professionals, especially the ones which are digital natives and the seasoned workers with less digital experience (Sastararuji et al., 2021).

The future of the accounting profession will require more skills than spreadsheet abilities or the value computation. Companies will focus more on tools utilization, that will enable them to optimize workflows and increase their bottom line profits by increasing the workload visibility.

During COVID-19 crisis *the need for integrated accounting platforms* had increased. Due to the increase of companies working remotely their most important asset becomes the implemented technologies.

The advantage of this integration, in this recent period, was that teams were connected no matter individual's locations, and had rapid access to data, all these bringing an overall increase in efficiency (Maa et al., 2021).

The disadvantage of this digitalization trend may be represented by the fact that some companies may decide to buy new and integrated systems, without being able to properly use them.

Successful companies understand that integrated platforms with existing systems and new systems based on AI have the ability to be beneficial and inevitable. On the other hand if companies will choose a particular tool only because it integrates with their systems higher costs and effectiveness may also occur.

Cloud migration was already a popular decision for the company even before the Covid-19 crisis. But in 2020, when the remote work increased, the new working conditions had reached new heights and development. During the pandemic crisis the cloud migration and the use of SaaS increased by 75% and in the Executive Report conducted by Softone (2021) 89% of the Romanian clients declared they were satisfied with the provided services. Softone is a multinational digital and cloud computing provider having headquarters in Romania, Greece, Cyprus and Bulgaria. In 2021 they conducted a study based on surveys on their clients, over 6000 companies who are using cloud computing and SaaS services.

The main reasons for which Romanian companies together with the of other countries where Softone is operating, decide to migrate their activity to cloud computing during pandemic crisis were chosen in the following order based on their scores as it was measured by SoftOne company in the study conducted in 2021:

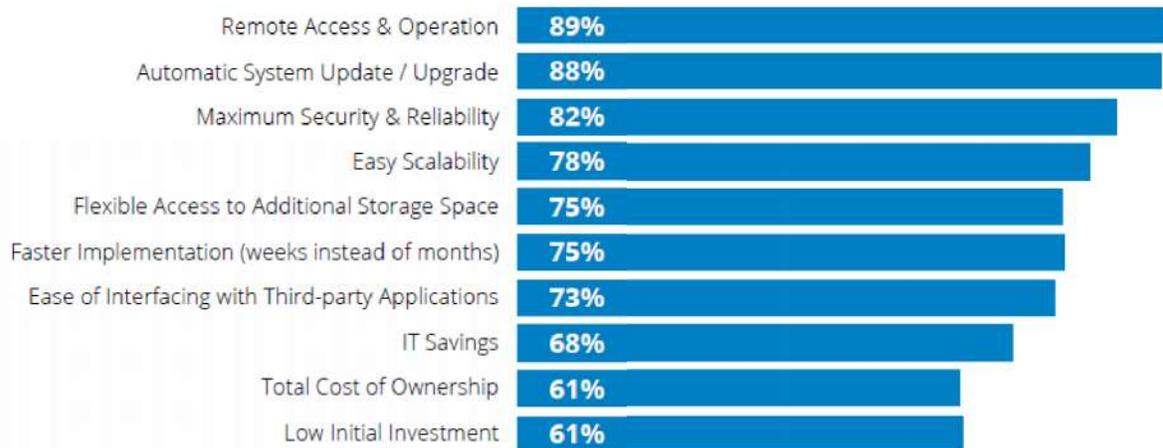


Figure 1. The main reasons for which companies migrated to cloud computing during pandemic

Source: Softone - Cloud adoption survey, Advantages & Prospects, 2021.

During the pandemic period the need for cloud accounting increased in the service sector by 81%.

Most of the studies mentioned the SMEs as the types of companies for which cloud accounting was a solution even before pandemic crises. Main reason was based on the limited resources of SMEs which won't allow them to invest in softwares, IT experts and the appropriate maintenance. Choosing cloud accounting solution systems will help them to reduce the initial IT costs.

The declaration of a CFO at a round table organized in 2020 by IFAC stated the new role of the accounting professionals, and that they need to be able to work as partners or collaborators with the executive teams, to be able to use technology, to identify risks for the company and to be able to efficiently communicate the risks at the level of the highest function of the business (IFAC, 2020).

Financial professionals need to focus on developing new skills, in order to remain relevant for their job. The financial teams have to understand and believe in the organizational culture and to favor collaborations.

A business needs to adapt fast, as a consequence of the environment transformation, in order to be relevant for its customers and to offer increased value at better prices. The drivers to change are multiple, from climate and sustainability, talent, information assets to digital customers and supply chains.

Cloud computing adoption is only a step on the business transformation not the final goal. As part of this transformation accountants must focus on customer interest and add value to financial services.

The key to organizational transformation is the effective use of data by employees using technological tools to process them. Nevertheless innovation, communication and creativity skills will become as important as technological skills.

Business models would have to significantly adapt and integrated most of these challenges, in order to ground the long-term sustainability of companies.

Conclusion

AI is changing the way accountants work, by updating the existing softwares with high-tech solutions. New types of services such as cloud computing, are now available at affordable prices

also for SMEs. Using SaaS, SMEs accounting companies can focus on their core businesses and the softwares, implementation, maintenance, and data backup is offered by the cloud provider.

During the pandemic crisis the need for integrated systems increased, mainly to support employees' remote work. Companies which were able to notice the opportunities on the market managed to survive and adapt to this challenging period.

Cloud computing increases the effectiveness and the efficiency of companies which was a considerable advantage during Covid-19 crisis. The constant improvement brought by cloud suppliers is providing new affordable tools and solutions including also AI for enterprises with limited resources. This will help the SMEs to also adopt AI solutions, being more affordable to use the infrastructure and maintenance from cloud providers than to invest in the necessary equipment and IT department.

The accounting companies who already implemented cloud computing and other digitalization solutions are more inclined to implement AI solutions because they understand the benefits this change will bring.

The benefits will be measured by specific KPIs once the accounting industry will implement AI solutions for a longer period of time. Two main advantages specific to AI solutions are the time reduction with repetitive tasks and data with reduced errors for decision making.

In this paper, we presented a comprehensive overview on cloud computing and its potential to increase the rate of AI solutions implementation also for SMEs in case of the accounting activity. Our research has shown that this topic is still immature in the accounting field. AI solutions are one of the most revolutionary technologies available nowadays but using its true potential requires more than technical improvements.

These results outline the framework for a future research on this topic, willing to explore the accounting professionals' attitudes and potential triggers for AI solutions implementation and its influence on the accounting system.

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