The benefits of migration from an on-premises environment to a cloud-based one for an accounting firm

BRIEF INTRODUCTION TO THE TOPIC

Cloud computing is evolving as a key computing platform for sharing resources such as infrastructures, business, software, and applications. An increasing number of companies are expected to migrate their applications to cloud environments. So when planning to move a legacy-style application to the cloud various challenges arise. The potential size and complexity of a project might especially discourage small or medium companies (SMB) from trying to benefit from the advantages the cloud promises. Analyzing the research achievements and application statuses, dividing the existing migration techniques in three strategies suitable to the cloud service models integrally. Distinct processes need to be considered for different migration strategies, and different tasks will be involved properly. Furthermore, observing that there is hardly any guidance available for migrating existing systems of businesses to cloud computing in terms of software engineering aspects. The term cloud computing is based on a collection of many old and few new concepts in many research fields like Service-Oriented Architectures (SOA) [10], grid and distributed computing as well as virtualization. Cloud computing has become popular really fast with the industry due to the clear advantage of reducing capital waste and transforming it into operational costs [1]. Cloud computing is a model for enabling universal, suitable, on-demand network access to shared pools of configurable computing resources such as networks, servers, applications, storage, and various services that can be quickly provisioned and released with slightness management effort or service provider interaction [2]. In order to utilize cloud computing architecture and secure the existing investment in legacy systems, enterprises are greedy to migrate legacy systems to the cloud today, and many companies consider moving entire applications or pieces of them to the cloud. Application migration is the process of redistribution of an application, typically on newer platforms and infrastructures, the migration of existing applications to the cloud requires adapting them to a new computing model being very widespread today[3]. A legacy system is an outdated computer system that remains operating still even after more modern technology has been released either because the organization may have invested considerable time and money in it or the legacy system holds valuable information [3]. As yet, much research has been done in this sector. A few works focus on decision-making support for cloud migration in the enterprise, therefore benefits, risks, costs, and organizational and socio-technical factors need to be considered before migration. Many researchers concentrate on migration methods, mainly about how to efficiently migrate a legacy system to the cloud platform. Some companies, organizations assign themselves to provide special development tools for migrating systems to the cloud. Up until now, some innovative methods have been preferred, related tools have been developed, and lots of organizations have made some free testing periods in migrating legacy systems to cloud computing analyzing any issues that could be appear [4]. An issue with an on-premise resource is that it is hugely inflexible and difficult to adapt to shifting quickly between business needs. One more problem is that it demands direct startup costs and keeps IT staff busy with tasks most likely not connected to the business core capacity. These are problems that cloud computing possibly could help cut down. The problem that many organizations deal with is how to decide whether to keep and upgrade, their current on-premise IT resources or to switch to and fuse a cloud computing service solution. Additionally, the organization needs to know if an available solution can replace the existing resource. The final problem that is examined is how the software system architecture should be designed to smoothly embed and benefit from cloud computing [9].

PURPOSE

The majority of business applications like enterprise resource planning or customer relationship management program have been placed "on-premises", enclosed by the organization's own IT infrastructure. Now, the relocation of these applications to the cloud has become a popular choice but is not the only option. Possible environments for housing business apps can be divided in:

- On-Premises (an on-premises / local environment refers to the housing of business applications on your organization's own IT infrastructure; primarily operated and secured by that organization's team, people who incur the costs involved in managing, licensing, securing, and maintaining the environment along with all the data involved in that business) [5]

- Cloud-Based (this type of environment refers to the housing of software, data, or storage space and other infrastructure on the internet which can be hosted by various organizations in public or private clouds on a host's infrastructure, dedicated exclusively to the respective organization; these environments are divided into three sub-groups:
    1. infrastructure as a service a.k.a. IaaS (e.g. AWS, Gcloud)
    2. platform as a service a.k.a. PaaS (e.g. MS Azure)
    3. software as a service a.k.a. SaaS (e.g. Office 365, Google Apps) [5] [6]

- Hybrid (this type of environment is one that employs both an organization's private infrastructure and a third-party cloud, with the integration of the two environments to allow data and business applications to be shared between them for the well-being of redundancy and flexibility) [5]

A small urban accounting firm wishing to remain anonymous describes themselves as "We are a boutique accounting firm located in midtown Toronto and have been operating in the financial services sector since 1985. We specialize in tax but also offer expertise in financial accounting, financial information systems, and consulting. Our clients include individuals with varying financial profiles, including some of the very high net worth, as well as incorporated businesses of varying size and sector" [7]. The problem that was discovered was as follows: within this company, information technology has always been a vital instrument, and it has shaped our history: our on-premises IT infrastructure has developed from a single staff desktop computer when our business was formed 35 years ago to a dedicated desktop or laptop computer with remote access capabilities for each of our team members with access to a shared drive on which protected data is stored [7]. We are a smaller size company that we haven't needed to expand beyond this gear for our IT needs. We've acquired accounting, bookkeeping, communications, and security software throughout the last two decades, which we've retained on-premises and updated with new software versions. The primary software used for accounting and bookkeeping was "QuickBooks Desktop". This program was acquired, updated as needed, and the license requirements were met every time [7].

This business has seen an increase in customer requests for real-time access to accounting and bookkeeping data, such as income and spending reports. Some clients have chosen to utilize "QuickBooks Online" and have asked for our help with the system. Other clients have asked for our help in setting up their QBO accounts. The idea of migrating to more efficent environment comes when two innovative team members joined in this business, they brought with them the determination to guarantee that our firm meets our clients growing digital needs in order to stay competitive in a broad market and a developing profession. To help with this, they started looking at IT solutions that may fulfill firm's new requirements [7].

When it came to this transfer, we decided to assign a client services associate to look into IT infrastructures for accounting software solutions that would allow our clients to view their data in real-time online. We knew from the start that real-time access would require access to one or more of the following:

- a cloud-based environment;
- an on-premises private cloud that can be accessed remotely;
- access to a hybrid environment.

The latter two choices, on the other hand, were rapidly shown to be neither cost-effective neither user friendly, for the following reasons:

- The majority of major accounting software vendors now provide two versions: one for accountants and one for accountants and clients. The former, such as “QuickBooks Desktop”, might be made available to clients in real time via a private on-premises cloud or a hybrid one.

- Setting up a private cloud or hybrid environment for remote access to this version would not satisfy clients without a high degree of staff participation, which would take extra time.

- Accounting software for accountants and clients, such as “QuickBooks Online”, is often only available as a subscription in a cloud-based environment. Several of their clients had requested that their subscribe to popular cloud-based accounting software like the one mentioned above, have three types of plans to choose from the less expensive to the most : “simple start”, “essentials”, “plus” all of them have downsides and advantages.

As a result, our client services associate was tasked with concentrating her research on cloud-based accounting software choices. Her first and most important concern was price. The most highly ranked cloud accounting software suppliers' websites provided full price alternatives online, making cost estimates simple. Everything was priced on a month-to-month basis. In some cases, cloud accounting software was advertised as "free" for accounting professionals to use, with monthly fees charged per person for any clients who wanted to access their files using the following options:

1. Wholesale billing (the company/firm pays a monthly subscription fee per client; the monthly fee per one client decreases as the number of clients increases from five to ten);
2. Direct billing (the accounting software supplier costs each customer separately for access; regardless of the number of clients that enroll, the monthly charge per client stays the same).

Given that we have approximately 900 personal clients and 350 corporate clients, we realized that opting for wholesale billing and paying our clients a monthly subscription costs would allow us to achieve significant economies of scale, assuming that many of our clients chose cloud access to their files. Data security was the second, and arguably most crucial, component of our client services associate's examination. Our top partners were adamant that client data should remain on-premises; nevertheless, we recognized that if our clients wanted real-time access to their accounts via a cloud-based platform, some of their information would be kept by a third party. As a result, our client services representative needed to find cloud-based accounting software vendors. As a result, our client services representative sought for cloud-based accounting software suppliers that met the following security requirements:

1. kept their Canadian customer data in Canada so it wouldn't be subject to data protection and privacy laws in other nations;
2. implemented redundancy and backup solutions to avoid downtime and data loss;
3. standards that assess privacy and security practices.

As a result, our client services associate submitted her research on cloud-based accounting software vendors that fulfilled our security and affordability criteria to our administrative team. We

decided that “QuickBooks Online Accountant”, which is available as a SaaS subscription, would be the best fit for our company for the following reasons:

- it complied with all of our price and security requirements;
- the “QuickBooks Desktop” environment was already acquainted to our staff;
- some of our clients were already using “QuickBooks Online” or QBO, so workers who had helped them with the program were already familiar with it.

Once “QuickBooks Online Accountant” transfer was authorized, following that, our client services associate finished many free QuickBooks online courses so that could become firm’s migration specialist and instruct other employees. This training is critical in ensuring a seamless transition to the new program and minimizing downtime and human mistakes. Until now, almost 50 of our clients have chosen “QuickBooks Online” to view their files. Our company has chosen wholesale billing and pays about $1,000 per month for membership, however, the per client wholesale cost is recouped by included it in each client's end of year invoice. Customers have indicated high levels of satisfaction with this service, owing to the simplicity with which they can access their current data and the greater transparency they have seen, and hence have shown no reluctance to pay the higher yearly charge.

What began as a slowly awareness in previous years that delivering cloud-based access to clients would help our organization was considerably accelerated in early 2020. The COVID-19 pandemic forced this business like the others to make a huge technical transformation, as we had to close our physical office and allow our workers to work from home with remote access and our clients to share their files and papers with us. Our tech-savvy engineers created an online file sharing portal for our clients in a short amount of time, and we've implemented several cloud-based software programs for employees, including an accounting workflow management system called “CCH iFirm”, a financial data retrieval/conversion system named “Hubdoc”, an intelligent accounts receivable and accounts payable management system “Plooto”, and an internal messaging system the well known “Slack”. These cloud-based software applications enabled our employees to remain productive and meet our client requirements without significant upfront capital investment. This was truly one of the most significant benefits of moving to cloud-based software says a company representant [7]. Cloud Data Backup Service is another advantage of this migration because easily managing backup in the cloud is that the data is available from anywhere in the world. This means that even in case of disaster the data can be accessed since it is stored off-site. However, a cloud backup service requires the devices to be connected to the internet for backing up and retrieving data, which was no problem these days, during the pandemic, all company employees work from home [8]. The Internet connection capabilities can be a deciding factor since huge amounts of data are transferred back and forth [8].

After migrating to cloud computing, this small accounting company learned three important aspects:

1. <u>Migration to a new environment (cloud in this case) can be expensive, and may be a value added to clients.</u> Paying a monthly SaaS subscription cost based on the number of clients who choose cloud-based access rather than having to comply with a complicated software license structure. While this cost may rise in the future if more of our clients opt to use cloud-based software, we will recuperate the monthly fees from those clients at the end of the year, resulting in a small net cost increase for the company. On the client side, they see the ability to obtain their reports in real-time as a value-added service for which they are willing to pay a premium.

2. <u>Client data is more secure in the cloud than on premises.</u>
   Enterprise-quality firewalls, data encryption, and security procedures secure the data of our clients who have chosen to access their files online, as well as continual monitoring and back-ups, audited privacy and security standards, and a decreased chance of device theft or

loss. Cloud providers can give a broader range of security features than we can as a small business.

3. Cloud access software shows improvements in performance aspects.
   Because it is supported by redundancy solutions, the cloud-access software has less downtime than our on-premises software. The employees will see fewer disruptions in their workflow as a result of this. Furthermore, with cloud-based software, company staff do not have to waste time debugging IT difficulties: professional help for any issues they find in the cloud is immediately accessible, and the software is automatically secured, backed-up, and daily updated.

Key elements comparison between a cloud-based environment versus an on-premise one		
Environment type	Cloud (On the internet)	On-premise (Local / In house)
Accessibility	Users have the possibility to access your organization's business apps from any device, anywhere in the world via an internet connection.	If off-site users need access to your company's business apps, you'll need to set up a VPN connection or a private cloud.
Recovery / Back-Up	The cloud provider is in charge of disaster recovery, which is made much easier by their huge number of servers and extensive security procedures.	Your company will need to put in place an internal disaster-recovery plan.
Scalability / Flexibility	1. As needed, the user pays for more cloud storage capacity; 2. Users can be added or withdrawn as required, adding more users may raise the cost of the cloud-access subscription.	1.When more storage space or processing power is required, a capital expenditure in IT infrastructure expansion will be necessary; 2. Internally, users can be added or deleted as needed, extra users may necessitate additional software licenses.
Licensing	1. In the future, licensing costs may become unpredictable; 2. The cloud provider is the target of any license audits done by a third-party software firm; 3. The cloud provider is responsible for ensuring that your business apps comply with their licensing requirements.	1. Licensing fees are usually calculated depending on the number of users during a specific time period. 2. The organization may be subject to frequent software audits since it is responsible for assuring compliance with the licensing requirements of your business applications.
Redundancy	Present a low risk.	Present a high risk.
Costs	1. Subscription prices may rise unexpectedly in the future; 2. This alternative requires a little initial investment; 3. Typically, subscription charges are classed as operational rather than capital expenses.	1. IT infrastructure maintenance and compliance with licensing needs are under way; 2. Enabling mobile access comes with an extra money charge; 3. Purchasing and increasing IT hardware and software is a significant capital expense.
Support	The cloud provider often provides 24/24 support for the cloud computing service model to which your company subscribes (SaaS, IaaS, or PaaS).	All aspects of your business IT infrastructure and business apps, including updates and upgrades, are mostly maintained in-house by authorized personnel.

Administration	1. The cloud provider retains control over software version releases and upgrades, as well as the ability to customize the software; 2. If you want to migrate the data to a new system or combine it with non-natively supported apps, the capacity of the organization to extract its data may be problematic; 3. The company data is located on a server that it does not own.	1. The software is frequently adaptable to the demands of the company; 2. The company decides when is time to update its licensed software; 3. The organization/company maintains complete control over its own data and has the ability to restrict external access to that data.

REFERENCES

Armbrust, M., et al.: Above the Clouds: A Berkeley View of Cloud Computing. Tech. Rep. UCB/EECS-2009-28, EECS Department, University of California, Berkeley (2009) [1]

R. Buyya, C. S. Yeo, S. Venugopal, Market-oriented cloud computing: Vision, hype, and reality for delivering its services as computing utilities. In Proceedings of the 10th IEEE International Conference on High-Performance Computing and Communications, IEEE, Dalian, China, pp. 3–5, (2008) [2]

A. Khajeh-Hosseini, I. Sommerville, J. Bogaerts, P. Teregowda. Decision support tools for cloud migration in the enterprise. In Proceedings of the 2011 IEEE International Conference on Cloud Computing (CLOUD), IEEE, Washington, DC, USA, pp. 534–550, (2011) [3]

M. Menzel, R. Ranjan. CloudGenius: decision support for web server cloud migration. In Proceedings of the 21st International Conference on World Wide Web, ACM, New York, NY, USA, pp. 979–985, (2012) [4]

Armbrust, M., A. Fox, et al. (2010): "A view of cloud computing." Commun. ACM 53(4): 50-58 [5]

J. Peng, X. Zhang, Z. Lei, B. Zhang, W. Zhang and Q. Li, "Comparison of Several Cloud Computing Platforms," 2009 Second International Symposium on Information Science and Engineering, 2009, pp. 23-27, doi: 10.1109/ISISE.2009.94. [6]

CPA Canada: Cloud Migration Case Studies for SMBs DECIDING WHETHER TO MIGRATE,pp. 20 [7]

Mulholland, A., R. Daniels, et al. (2008). The Cloud and SOA: Creating an architecture for today and for the future, Cap Gemini [8]

MDSOL (2010). Cloud Computing - Driving Security, Performance and Quality, Medidata solutions worldwide [9]

Enquist, H. and G. Juell-Skielse (2010). Value Propositions in Service Oriented Business Models for ERP: Case Studies [10]