Bookkeeping in the Cloud: Advancements in Accounting Software

by

Sean Flaherty

Honors Thesis

Appalachian State University

Submitted to the Department of Accounting
and the Honors College
in partial fulfillment of the requirements for the degree of

Bachelor of Science Business Administration

May, 2018

Approved by:

_____
Scot Justice, Ph.D., Thesis Director

_____
Bill Phillips, MBA, Second Reader

_____
Dawn Medlin, Ed.D., Departmental Honors Director

_____
Jeff Vahlbusch, Ph.D., Director, The Honors College

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

ABSTRACT

In our constantly changing economy, it is crucial for a business to be able to stay flexible and responsive with the information it gathers, processes, and provides. Due to this fact, the relationship between information technology (IT) and businesses has grown tremendously through the years. One of the newest concepts from IT is cloud computing. This service allows for the connection of multiple devices to servers around the world from any location with an internet connection. Cloud computing has started to secure a foothold in the accounting software market. While the users of this new software are increasing every year, many firms and businesses are still cautious on making the switch. This paper will mitigate the concerns of accountants about the software by addressing how the software works and the various advantages and disadvantages that it provides to a firm.

INTRODUCTION

Defining Cloud Computing

Within the past decade, the technology that has seen the most growth is cloud computing. Cloud computing is different from traditional computing in the way that information is accessed and stored. In the traditional computing method, data is accessed and stored on the premises where the computer or server accesses the data. This form of computing requires the user to download software directly onto their computer, and any other computers that will need the benefits of the software. Once a file is created through the software, the information is saved directly to the computer. If a user wanted to access files that they created on a desktop, they would have to return to that same desktop, or transfer the files manually through the use of a universal serial bus (USB), to access the files again. The important thing to remember about transferring the file to another location is that any edits done to the file will only be applied to the file on the computer the edits occurred. For edits to occur on the original computer, the file would have to be transferred back as an updated version. The alternative to this would be to utilize a local access network (LAN) to connect to a personal server where the company's files are stored. This would allow users to access files from any device that is connected to the server. This method of file access is popular in businesses and schools, for example, due to the large user base. However, this still means that for the files to be accessed, the user must be on the premises where the server is located. However, cloud computing works to combat some of these tedious issues.

Unlike traditional computing, information accessed and created through cloud computing is not tied down to the hardware that it is created and edited on. While traditional computing required users to download and install software to every device, software for

cloud computing is remotely accessed. The software being utilized by the user is located on a remote server that is provided by the software company. For a user to access the software, all they have to do is connect to the internet and sign in to the portal that the cloud server provides. When information is created and edited, all the information is saved to this remote server. Files for this information will not be located on the computer that they were accessed on. Instead, information can be accessed and edited from any device that has an internet connection. The location of the user does not matter. This form of storage also means that any edits to the file will be recognized at all locations the moment the changes are submitted and saved. Some software allows for user edits to be witnessed in real time by others. This technique can be seen in Google's online document creation software, Google Docs. Whenever an edit is made to the document, the software automatically begins updating and saving the changes. This allows users to see the progressive typing of the other users as in real time. Plenty of software programs have appeared in an attempt to utilize cloud technology. Some people utilize cloud technology on a daily basis without even realizing it. With the popularity of cloud computing, it only makes sense for businesses and firms to start applying it to their accounting methods and offerings.

Cloud Accounting Software

Technology has always been adopted into the accounting sector with the hope of making the accountant's role more efficient. One of the biggest technological changes in accounting occurred when the accounting world shifted away from pencil and paper and started utilizing computers and accounting software. The adoption of computers brought about the end of pencil and paper accounting. Along with a new efficiency in the job, accountants also found their work leaning more on the analytical aspects of the job

description. "The job became less tedious with less of a margin for error. The core training for accountants which included the basic accounting, auditing and tax preparation was a thing of the past. With use of the computer an accountant can now perform statistical accounting or forecasting analysis with greater efficiency" (Pepe, 2009, para. 3). With the emergence of cloud computing, it appears that there is going to be another advancement in accounting practices. This one continues to improve upon the accountant's efficiency, but also focuses on increasing ease-of-access and cooperation.

I have narrowed the scope of this paper so that the term cloud accounting software refers to bookkeeping software. Cloud accounting software is being offered as software as a service (SaaS), instead of software as a product (SaaP). Instead of the user buying the software, cloud accounting software is accessed through a subscription based method. The user does not download or maintain any of the software on their personal computer. The vendor hosts and maintains the software on their servers and the user is capable of accessing the software by connecting to the server through the internet. Through this process, the vendors never relinquish control of the software. They continue to update it and maintain it, which is the service the users are paying for through the subscription. Instead of the user owning the software, it is more suitable to say that they are renting it (Defelice, 2010). Subscriptions are scalable to the use of the user, which allows them to choose a model that best fits their current business needs and to easily increase services as their business grows, and are typically made as monthly payments that do not require a contract commitment. Most providers offer the capability to change, or even cancel, subscriptions at any time.

THE CONCERNS BEHIND CLOUD ACCOUNTING

The change to cloud accounting software is something that has been acknowledged

by accountants, but has not been implemented into practice by a majority of accountants

("Management of Accounting Practices Survey," 2015). In the article *The CPA of the Future*

by CPA.com, a subsidiary of AICPA, they found that "90% of the CPAs surveyed agreed

that the delivery of digital business processes to clients will become a key differentiator

among accounting firms in the next five years" (Drew, 2015, para. 5). However, the 2014

Management of Accounting Practices (MAP) survey by the AICPA Private Companies

Practice Section (PCPS) and the Texas Society of CPAs (TSCPA) involving around 1,750

firms revealed that the cloud industry had a lot of catching up to do. As shown in Table 1, in

the category of bookkeeping software, anywhere from 73% to 82% of firms utilized on

premise accounting software and 1% to 9% utilized pure cloud software.

Table 1
Bookkeeping Access by Company Revenue

Primary Way of Accessing Bookkeeping Software	<$200K	$200K to $500K	$500K to $750K	$750K to $1.5M	$1.5M to $5M	$5M to $10M	$10M and Up
Pure cloud/software-as-a-service (e.g., log in to website)	9%	7%	5%	7%	8%	1%	4%
Client/mobile app and cloud hybrid (e.g., log in to app on device but need internet access to get to knowledge base)	0%	1%	1%	2%	1%	1%	4%
Hosted/virtual (e.g., Remote Desktop, Citrix, XenApps, VDI)	5%	6%	7%	8%	12%	17%	18%
On-premise	73%	79%	82%	80%	75%	77%	69%
N/A	9%	5%	4%	3%	4%	3%	2%
Other	3%	1%	1%	0%	1%	0%	4%

("Management of Accounting Practice Survey," 2015)

Despite acknowledging that accounting needs to be moving towards newer

technology and the cloud, Table 1 indicates that accountants have been slow to change to

new software. As with any new technology, there are always plenty of concerns that hold

people back from investing in the new trend. In 2013, CCH, a software and information

services provider for tax, accounting, and audit workers, conducted a survey on cloud

accounting with 1,018 small business owners and 212 accountants. In this survey, they asked

the accountants why they had not adopted cloud accounting software. Table 2 showcases the

top concerns given by accountants during the survey to why they have not adopted cloud

computing. I have separated the results of this survey question into the following four

categories for discussion: transferring to a new system, data security, lack of features, and

knowledge of the software.

Table 2
Why Accountants have not Adopted Cloud Computing

Have a Working System	37%
Security Concerns	31%
Not Enough Time to Investigate	29%
Not Familiar with what is Available	28%
Clients Nervous About Cloud-Based Systems	25%
Downtime	12%
Not Worth the Cost	12%
See No Benefits	6%
Don't Know	16%
Other	5%

("Cloud Computing: A Matter of Survival for the Accounting Industry," 2013)

Transferring to a New System

Evident in CCH's survey from Table 2, the primary concern for accountants not

moving to a cloud based system is that they already have a system that they are experts at

using. Although people tend to enjoy the idea of improving processes with change, they are

often hesitant to make a change once the opportunity appears. There is predictability in a

system employees are already experts in and are comfortable with. By switching to a new

system, employees must learn the new system from the ground up. This costs the company time and money as work speed can slow down, training may have to be provided, and quality may even drop on projects while staff learn how to effectively leverage the new software. As with any software, the manager also has to worry about the time it will take to shift old information to new systems. This concern is linked to accountants wondering if the switch is worth the time, money, and effort.

Data Security

The second largest concern of accountants, according to Table 2, is the issue of data security in the cloud. This is one of the most publicized concerns of the cloud. Accountants worry that their information will not be as safe as when it is stored on their personal computers. Since cloud information is stored on the internet, it is perceived as being easier to access and to hack into. Accountants want to know that the service that they are provided through cloud accounting software will allow for proper protection of their important data and files.

Lack of Features

One of the smaller concerns brought up in Table 2 was about the cloud software's features. 12% of surveyed accountants stated that they thought cloud accounting software would not be worth the cost, and 6% of all accountants surveyed even added that they saw no benefit in the cloud accounting software ("Management of Accounting Practices Survey," 2015). Accountants are concerned that this new software will not supply them with features that will allow them to utilize the software the way that they want. If software cannot perform to expectations, then there will be no reason for an accountant to want to make the

switch.

Knowledge of the Software

The world of technology is always changing. It is often thought that a piece of technology becomes obsolete the moment you buy it. With such rapid changes, it is hard to stay up to date on the latest and greatest pieces of technology. As seen in Table 2, 29% of accountants stated that they did not have time to investigate, 28% stated that they were not familiar with what was being offered at the time, and 25% stated that their clients were nervous about cloud software. Without being able to research and without knowing what is being offered, it is no wonder that clients would be apprehensive about adopting cloud software. Without time to do research and to know what is being offered, it is hard to weigh advantages and disadvantages to see if there are improvements that can be made to an accountant's current system.

ADDRESSING THE CONCERNS OF CLOUD ACCOUNTING SOFTWARE

Knowledge of the Software

The overall purpose of this thesis is to address the concerns that accountants have for changing to a cloud-based software product. Accountants and clients alike are concerned about the unknown that cloud computing creates. This section of the thesis will focus on key aspects of cloud accounting software and provide an analysis of the advantages and disadvantages that each section provides. This discussion will not only address the major concerns presented in the prior section, but also other areas that may not receive as much attention. These other concerns include physical safety of data, cost of the system, and ease

of access and convenience. By providing as much information as possible in these sections, accountants and business owners will be able to save time on research by only having to look in one place.

Transferring to a New System

The primary concern accountants have for transferring to a new system is a justifiable one. A business thrives on being efficient and knowledgeable about what they offer. A transfer to a new system not only requires time for the system to be implemented, but for employees to become acquainted with the software as well. The impact and complexity of moving to the cloud is related to the software, size, business style, and technological experience of the firm trying to implement it.

As with any software change, the first thing to focus on is getting old information to the new software. For some cloud computing solutions, this task may not be as hard as others. QuickBooks Online has integrated a migration process that allows users to transfer information from their desktop QuickBooks software straight to its cloud computing counterpart. For cloud software that is not directly linked to another accounting software, there is often the option to transform accounting information into an acceptable file format. Many cloud options utilize CSV files to read accounting data from other software. These files are easily managed through Microsoft Excel and are plain text, tabular versions of the user's accounting data. Although these systems have a means for importing prior data, they do not allow for all file types and may not be able to recognize every form or file that is uploaded. Recent transactions will have to be entered manually and other transactional information, such as direct entries to the general ledger, will have to be entered as summary information, such as a trial balance. If you do not have software or file types that are

compliant with the import limitations, historical data will have to be saved personally on your desktop. This will mean that the information on the cloud accounting software will start off as summary information with no historical data in it.

The size and culture of the business are also going to impact the ease of integration. Larger businesses are harder to initially transfer over to the cloud. There are a lot more people to train on the new system and a lot more files that will have to be transferred. If a business also tends to have substantial inventory, high transactional numbers, or complex software integration, they might also have a hard time starting their transition to the cloud ("Moving Your System to the Cloud," 2017). Having substantial inventory and a large amount of transactional data would mean that more files would have to be converted or even manually entered into the new system. If a business relies on a system of interwoven pieces of software, integrating the cloud system may prove to be difficult and time consuming. Companies that are more suited for a swift transition to the cloud are small, young, tech savvy companies ("Moving Your System to the Cloud," 2017). They will have less members to train, have less financial information to transfer, and will be more comfortable and familiar with the way that new technology works.

The final thing to know about transferring to a new system is when to do it. With transferring data, you want to make sure that it is clean and up to date. The best times for transferring would be after month end, fiscal year end, or after a major account clean up. Data cleansing, or data scrubbing, is a process used to detect and correct data in a database that is incorrect, incomplete, improperly formatted, or redundant (Laudon, 2018). This allows for the data being transferred to be error free and consistently formatted. However, preparation for the switch should be done a couple of months before the agreed upon transfer.

This will allow users to become familiar with the system and can lessen the workload during the migration process. Due to the cloud accounting software's network connectivity, it can be linked to bank transaction information. This means that, during setup, accountants can continue to work on the old system while the cloud system automatically updates through the bank feed. This strategy of implementation is known as a parallel approach. By running two systems at once, employees can get comfortable with the new system while still utilizing the old, and the results of the new system can be compared to the old to make sure that everything is working properly (Gelinas, 2015).

Data Security

As seen from the survey in Table 2, people are skeptical about the security that cloud computing offers. Not having physical possession of company data and thinking about the harm data breeches can cause a company are concerns that make executives uneasy. However, what organizations fail to see is that cloud service providers often offer security measures that are superior to the security many firms have in place on their internal servers. I propose that cloud service providers follow best practices to protect client data with some of the most sophisticated techniques.

Despite the security concerns discussed above, many individuals have no problem utilizing a cloud service known as mobile banking. An internet connection is all that is needed to access your bank account and personal financial information. Despite the amount of personal data that can be accessed through the internet, consumers utilize mobile banking because they trust the cloud security the bank has put in place. Banking and financial industries are some of the most regulated when it comes to security due to the amount of sensitive and private data that they handle (Probasco, 2017).

The technology that supplies some of the best security for the data being held is encryption. Encryption is the use of algorithms to transform data into a cipher that can only be decoded by the proper key. Through the use of Secure Sockets Layer (SSL) and Transport Layer Security (TSL), data can be encrypted while it is being transported through a secure connection between the client and server computers (Laudon, 2018). The aspect that makes bank level encryption ideal is its strength. Banks are regulated to have Advanced Encryption Standard (AES), a popular encryption algorithm, 128-bit encryption or higher (Probasco, 2017). When referring to the bits in encryption, it is the number of bits that the encryption and decryption key are. Simply put, the more bits there are the longer and better the key is. There are 2^{128} different key combinations that a program would have to go through to crack 128-bit encryption. A hacker would need to use a massive amount of computing power and thousands of years to break 128-bit encryption ("What is 128-Bit Encryption?" 2017).

In a similar manner to banks, cloud accounting providers utilize a high level of encryption. Servers in cloud-based accounting provider datacenters are providing a minimum encryption of 128-bit and some offer encryption as high as 256-bit. Through the added use of firewalls and intrusion detection software, providers are making sure that data is safe as it is being transported to their datacenters and stored within. Although encryption provides safeguards against direct access through hacking, such measures are useless if a hacker either guesses or gains access to the user's login information (i.e., user ID and password). Thankfully, security measures have also been put in place against that.

Cloud accounting providers have different authentication techniques to ensure that the person logging into the account is the authorized party. Aside from the username and password, companies may implement two factor authentication. This is a technique that

requires the user to enter multiple forms of identification before they can log in. Some companies may have the user also enter a security pin that is either emailed or sent as a text when a logon is attempted. Another means of two factor authentication is prompting the person logging on to answer a security question before they are able to gain access to the data. For an unauthorized party or hacker to access your account and financial information, they would not only have to know your username and login but they would also need to have access to registered devices or email accounts for validation codes. If, however, a person is able to successfully log in to your account, there are security measures put in place to alert you and prevent further actions. Many software vendors have a feature that when enabled notifies the authorized user that someone is logging into the application. When such a logon is made, the application alerts the user by either text or e-mail that an attempted logon has been made. If the attempted logon was not authorized, the software will automatically log the user out and block further access from that location or computer.

Cloud software also includes user permissions, which limit what data certain users can view and edit. If someone does successfully enter the system undetected, they would need the appropriate user permissions to retrieve the data that they are after. The audit log that is built into most software will also report on when data is modified and who modified it. This allows for constant surveillance within the system.

When signing a contract with a cloud service provider, it is important to know the controls that the cloud application provider has put into place to protect your data. The American Institute of Certified Public Accountants (AICPA) has created a service that CPAs can offer clients that attest to the controls an application has in place. These documents are known as Service Organization Control (SOC) reports. There are three types of SOC reports

that CPAs can provide, SOC 2 and 3 pertain to security controls. The SOC 2 report is intended for users that have a comprehensive understanding of internal controls regarding security, availability, processing integrity, confidentiality, and privacy. The SOC 3 report, also commonly known as a SysTrust report, is a more generalized SOC 2 report and is meant for users that do not have the sophistication to understand the SOC 2 report (Defelice, 2010). Users can request these forms from their service providers to check on the controls that the operations have in place to safeguard their data. Some cloud providers provide dedicated webpages where users can access and/or request these security related SOC reports. The opinions from CPAs on SOC reports generally state that the security the cloud provider has in place are "…likely to meet the assurance and reporting needs of the majority of users of cloud services" ("AICPA Cloud Computing Controls Endorsed by Security Group," 2013, para. 4) by the Cloud Security Alliance.

There are privacy concerns that no level of encryption or log in authentication can address that stem from government surveillance and data retention. When choosing a cloud computing provider it is important to know where your data is located because your data may be stored on servers in locations outside of the firm's country of origin. Such location of the firm's data may subject the data to laws such as the America's Patriot Act and India's Information Technology Act where the federal government is granted access your personal information (Gilbert, 2011).

Having data stored outside of the organization's country may subject the user to implement different document retention laws for each country the data is housed in. Document retention laws require that data be retained for a certain period of time. For some countries, this can be as little as a few months or as great as a few years. If a company goes

out of business and terminates its cloud service contracts, the countries hosting the servers still require that copies of the files be retained for access by government officials. Despite these laws and regulations, government officials still need to possess a warrant or court order to search computer systems in most cases (Gilbert, 2011). A best practice that a cloud application client can implement is to add a clause in the service provider contract so that all government and legal access requests be forwarded to the client. This will make it so users know when their data is trying to be accessed by officials and that they have a say in whether the data can be accessed or not.

Lack of Features

Many firms are concerned about the lack of features offered by cloud computing vendors. In my opinion, this concern is one that is less valid as time goes by. As with any technology, software is constantly being updated and improved. Features that were not present in one version of a software will hopefully find their way into the next. Over the last decade, cloud accounting has continually improved and is now comparable to desktop applications. To illustrate this, I would like to take an in-depth look at the development and growth of QuickBooks Online (QBO). QBO was released in 2001. A chart from 2006 comparing the all the versions of QuickBooks (desktop and cloud services) showed that QBO was only a fragment of what the QuickBooks desktop versions were. It lacked the ability to track inventory, only three users could use the service at the same time, there was no customer or vendor tracking, you couldn't download bank and credit card transactions, and there was limited ability to integrate QBO with other applications ("QuickBooks Comparison Chart," 2006).

The limitations of the first generation of QBO lead Intuit to decide to build the next

generation of QBO from the ground up in 2013 to address these issues. Intuit's new version

of QBO focused on providing higher degrees of functionality, higher integration with other

Intuit and third party software, and a more streamlined user interface across all QuickBooks

products ("Press Releases," 2013). As improvements continued, the online version of

QuickBooks became more comparable to the desktop versions.

       In 2017, a good comparison can be made between QuickBooks Online Plus and

QuickBooks Premier. Both of these models are the top of the line applications for cloud-

based and desktop applications respectively. According to Intuit's product comparison chart,

QBO Plus only completely lacks three of the features that QuickBooks Premier has and is

limited in three others. The three features that are completely missing are creating of

forecasts, managing inventory reorder points, and customizable inventory reports. The three

limitations are the amount of industry specific reports QBO Plus offers, the fact QBO Plus

can only import data from Excel and QuickBooks, and that QBO Plus has 65+ reports

compared to QuickBooks Premier's 150+ reports. However, QBO Plus does provide

automatic online backup, multi-user access, and remote access that Premier does not offer

("QuickBooks Desktop Comparison Chart," 2017). While the chart on Intuit's website does

not provide every difference between the two software products, it does provide good

overview of the features for comparison purposes. Intuit is making strides to make QBO the

primary option for QuickBooks accountants. I believe Intuit, as with many other cloud

accounting application developers, are confident in the advancements being made with their

cloud solutions, where the cloud solution is comparable to desktop applications.

IMPORTANT ASPECTS OF CLOUD ACCOUNTING SOFTWARE

Physical Safety of Data

When thinking about cloud computing and safety, most people worry about the security of their information on the web. They worry about the data security and the online security measures that are put in place to protect it. A factor of safety that seems to be forgotten is physical safety. While most people are worrying about hackers, they are sometimes forgetting physical dangers to their data. Not only should a business owner have to worry about the access of their data through the internet, but also the protection and security that is being provided to that information from physical theft, getting lost, and natural disaster.

Businesses can be harmed by equipment theft and natural disasters. If a computer is stolen from the workplace, all the files that are on the computer are also taken with it. This could be a large amount of highly delicate and confidential information. Once the equipment is stolen, there is no way of getting the files off of the equipment either. Files that are stored on the computer can only be accessed and altered from that computer. This importance in security also comes into play with the possibility of having the information get lost when being transferred. Some files are simply too large to be e-mailed, so they must be transported through other means. Some of these means may require the use of a USB drive. No matter how useful and convenient USB drives are, their size ends up being their biggest flaw and benefit. They are small and compact, which allows for easy transfer from one facility to another. However, this size also makes them exceptionally easy to lose. Once these tiny devices are lost, the information on them is lost as well. Business owners may be smart enough to have an extra copy of the files on their computer, but that does not change the fact

that the drive is somewhere out there with all the information still accessible on it. A safeguard against this would be encrypting the USB so only authorized users with the encryption key can view it. Similar to how a person can cancel their credit or debit card once it gets stolen, files of this importance need to have a safeguard to prevent information from ending up in the wrong hands.

Along with data being stolen and lost, there is also the possibility of it being destroyed. Disasters, ranging from fires to floods, can happen anywhere and at any time. If a big enough disaster strikes, a business can find themselves at a loss. Entire buildings can be leveled, and large amounts of data can be completely lost. If a disaster occurs and manages to damage a business's computer network or servers, then the information becomes inaccessible. Businesses may find themselves starting over with blank ledgers and accounts. Plenty of companies had to experience this due to an earthquake in Christchurch. The earthquake destroyed many businesses and halted business for many others. An accountant from the area stated, "The Christchurch earthquake made many accountants [and business owners alike] realize that, if something happens to their office and they can't get in anymore, it's very hard for them to keep carrying on with their businesses. Cloud computing is like a remote backup [of their businesses' information systems]," (Ma, 2015, p. 76) during an interview.

Cloud computing offers a solution that allows for business owners to ensure the physical safety of their data. When it comes down to the issue of theft, data stored on the cloud is not kept on a computer. Instead, information is stored on large server systems. If someone were to get access to a business computer, they would have to know how to enter the server system to access the files. They might not even be able to access the files that they

desire due to edit and view limitations. In another situation where someone might physically take an entire server tower, the information is still safe. Information directly in the server tower is not stored in a standard file format. Instead, it is stored as encrypted data. For someone to access information directly from the server, they would have to know how to unencrypt the information stored on it.

The server system is also what allows company information to not be lost during transfer or completely destroyed during natural disaster. The physical transportation of files is what allows for information to be lost during everyday use. Cloud computing allows for files to be accessible from all locations without the need for email, USB, or physical printing. In the case of natural disaster, most cloud providers utilize a redundancy system. While they have a main server system in one location, they also have an entire series of servers that specialize in making copies of the information stored on the main server in another location. If a disaster destroys the main server system, then the provider will switch access over to the redundancy servers. This ensures that little to no data is lost and that companies may continue business as normal.

Cost of the System

Interestingly enough, one of the concerns that did not make it on to the accountant's list of concerns in Table 2, was cost of the system. While accountants were worried about the product not being worth the cost, the overall costliness of the system was not brought into question. This is understandable due to how the cloud accounting systems manage costs. Unlike the traditional accounting software model, cloud accounting focuses on reducing initial cost of the system and the overhead costs that a business might incur in the long run. This concern is rather important since the results of a cost/benefit analysis could be the

deciding factor on implementing a new system. While it is hard to quantify all costs of a new software implementation, it is important to at least identify the costs (Gelinas, 2015).

The initial savings of cloud accounting software starts at the price of acquiring the software. Traditional desktop systems work under a model where the user pays a lump sum at acquisition for the product that they want. This lump sum normally only includes the software and nothing else. If the customer wishes to add customer support, backup capability, multiple users, annual updates, or bank account transaction linking, they will have to pay separate fees on top of the original software cost. This can lead to a pretty costly investment from the start and could come back again if the business grows at a fast enough rate, since upgrading requires a new software purchase and additional licenses.

Cloud accounting makes the process of initially buying the software easier and more cost efficient. First, cloud accounting typically works on a monthly subscription model. Instead of paying for the software in one lump sum, the payment is spread throughout the year as an even, monthly expense. Not only does this take the burden off of a large, one time investment, but it also makes it easy for the client to keep track of payments on their cash flow reports as opposed to having to capitalize and depreciate the lump-sum cost over the life of the software. Cloud accounting also brings the benefit of providing everything in its monthly subscription and providing flexibility to the user. Unlike the traditional system, most cloud accounting software includes customer support, bank transaction linking, updates, and multiple user access in the subscription price. Some of the most popular software on the market (i.e., QuickBooks Online, Xero, and FreshBooks) provides convenience by not having the user tied down to a contract. If they try cloud accounting and decide that it isn't the right time for them to switch to it, then they can cancel their subscription and not worry

about paying for the service in the months to come. On the other side, if a user decides that

their business is growing and they need more from their cloud accounting service, all they

have to do is upgrade their subscription plan. All their data will stay constant, extra licenses

are not required for the upgrade, and they will only be charged for the new package from that

point on.

Once the system is put into place, cloud accounting further demonstrates its cost

savings by reducing equipment related overhead. With traditional systems, the costs of

maintenance and hardware that support the software are completely dependent on the

company. The company is directly responsible for supplying capable computers, server

systems, external hard drives, and proper environment (i.e., cooling, heating, electricity,

bandwidth) to support the system. Along with that, they should have an IT team to make sure

that the system is properly running at all times. Whenever a problem happens, or changes

need to be made to any of the software or hardware, the IT team is employed to fix and make

those changes. The cost of the traditional system is the repeated cost of acquiring the

software, updating it, providing capable hardware to support it, maintaining a proper

environment for the equipment, and employing an IT team to keep it all running smoothly.

Cloud accounting systems do away with most of these costs. In terms of hardware,

the most important thing for a business to have is a proper modem and internet provider.

Transitioning to a cloud-based solution will not completely eliminate IT costs and hardware,

but it will likely reduce the costs and maintenance to the firm. The most extreme case of

cloud adoption would be a company running all their functions exclusively through the

cloud, and only requiring internet access and a computer. While computers will still have to

be purchased, the quality and power of them is capable of being flexible. When working on a

traditional system, the computer running the software has to have enough processing power to sort through all the pieces of information that are present in the files. As the company grows larger, stronger computers are required to make sure they can stay up to speed. With cloud accounting, all the processing power is being handled on the servers at the cloud facility. A computer can be a few years old, but as long as it has the capability of running and keeping a good internet connection, no issues will occur in terms of processing data. The IT team will also be considerably downsized. All updates and maintenance occur at the provider's facilities. If there is an issue with the software, or an update is scheduled, the provider will attempt to handle the matter in an efficient manner.

Ease of Access and Convenience

The main difference, and most prevalent advantage, that cloud accounting has over on premise software is its ease of access. Due to cloud accounting being connected through the internet, users can access the software from any location with internet access and on any device with internet browsing capabilities. This can be a major advantage for business owners and accountants alike. Traditionally, accountants would only receive information from their clients on a weekly, if not monthly, basis. Information was often transported in batches through physical files or USB drives. This would mean that the accountant would only have access to transaction information days after it occurred. Erroneous entries and inadvisable transactions would not be seen by the accountant until long after the transaction had taken place. With this new degree of access, accountants can now have instantaneous access to their client's books. Questions can be answered at any time, errors can be spotted sooner, and entries and reports can be created in a timely manner. This becomes especially

beneficial for business owners and accountants who are typically on the move or are naive in running an accounting system for a business.

Cloud accounting software also provides a great amount of convenience through its connectivity. The main focus has been on accessing cloud software through your laptop, but many companies have mobile apps that connect with their browser based counterpart. Keeping track of business expenses on a trip has never been easier. Instead of holding onto receipts and turning them in at the end of a trip, mobile apps will allow you to upload an image of your receipt with the expense. This way there is no hassle in keeping track of the source document. These applications may not provide as many features as the browser based version, but they still allow for light accounting work on the go. Most apps (i.e. QuickBooks, FreshBooks, and Xero) will allow the user to create and track estimates, invoices, expenses, and payments.

Similar to how the browser based version and mobile version of cloud accounting software are able to connect with each other, these applications are also able to connect to other third party internet based applications. Connecting to different applications can simply mean having transactions automatically linked to the base accounting software, or even adding and improving features within the base accounting software. As mentioned above, accounting software mobile applications allow for pictures of receipts to be stored with the expense incurred by the user. Some applications, such as Expensify, have taken it a step further by incorporating OCR technology that interfaces with cloud-based accounting services. Optical character recognition (OCR) is a software that transforms document images into editable computer text files (Wyle, 2007). This allows users to scan forms, such as physical invoices, and other images, such as PDFs, to make them searchable and completely

editable. This allows the program to identify key information on a form (e.g., vendor name, date, and amount) and submit it automatically into the system. Another technology that could enhance the submission of data retrieved from OCR is artificial intelligence (AI). AI is a computer based expert systems that attempts to imitate human behavior (Laudon, 2018). Through machine learning, which is the process of computer programs improving themselves without explicit programming (Laudon, 2018), software can teach itself to perform tasks and even improve upon them.

As the AI program becomes familiar with how expenses and other transactions are inputted into the accounting software, the AI becomes better at categorizing and inputting transactions automatically. QuickBooks Online already has AI in place with their auto-categorization feature and expense finder ("Machine Learning: Unlocking the Power of Millions for the Prosperity of One," 2017). Together, AI and OCR have the potential to reduce manual data entry time and errors for cloud-based accounting application users.

The second form of connection, as mentioned above, is connecting your accounting software to another application to automatically share transaction data. Businesses and payments are steadily becoming more digitalized, and the largest mobile person-to-person payment provider is PayPal (Panno 2016). For e-businesses, PayPal may be their primary transaction base. The cloud allows for the accounting software to be linked to the user's PayPal account and to record transactions from it automatically. All the user has to do is setup how they want their accounting software to recognize PayPal transactions and then the software will do the rest. The software can also sync with the user's business bank, Square, Shopify, and many other applications to allow automation for brick and mortar businesses.

The automation of the accounting systems not only cuts back on time needed for manual entry, but also reduces the errors that are produced from it.

Although connection through the internet is one of cloud computing's strengths and is the reason for many of its conveniences, it can also act as one of its biggest problems. Cloud computing runs solely through the internet. If there is inaccessibility or a disruption in the internet connection between the user and the server, then the ability to use the software will be reduced or become none. Accountants who travel may end up in areas where they cannot access an internet connection. Without it, they won't be able to perform their work until they go somewhere else. Businesses with a large employee base or an undependable internet provider may also find that their service is slow and has long load times for cloud-based applications. This would be due to the bandwidth of the company being consumed or having low internet speeds. Making sure you have a reliable internet provider can make the difference on how you experience cloud applications. For companies that want to take extra precautions, contracting with a second internet provider may be a good best practice to adopt. If something happens to the firm's primary internet provider a second provider gives the firm the capability to work uninterrupted. Utilizing Ethernet instead of Wi-Fi will also lead to improvements, as long as it is within your internet provider's plan.

There is the aspect of server downtime that the consumer cannot control. As with all internet applications, a server sometimes has to be disabled for maintenance and updates. They are a necessity that keep the software up to date and running at full potential, but it also means the service will be unavailable for a certain time. Most companies will try scheduling these down times during minimum traffic hours, but it can't always be guaranteed. There are times when the servers unexpectedly go down. Cloud providers try to run off the "five nines"

principle, where their servers are up 99.999% of the time and the rest is unscheduled

downtime (Defelice, 2010). However, this is a big promise to keep and does not account for

the downtime for scheduled server maintenance. When the servers come back online, there is

also the risk of some features no longer working. This is an inherent risk with any update in

software, since some features may no longer be compatible with the new model. The

developer will often make the effort to reinstate any missing features within the next update.

WHAT ACCOUNTANTS WANT FROM THEIR SOFTWARE

Capterra is a business that reviews and lists over 200,000 different kinds of business

software to allow business owners and employees the opportunity to compare software and

find the best fit for their business. In the summer of 2015, Capterra surveyed 500 businesses

of varying sizes about their accounting software. Table 3 displays the top five most desired

features that businesses said that they wanted from their accounting software.

Table 3
What Accountants want from their Accounting Software
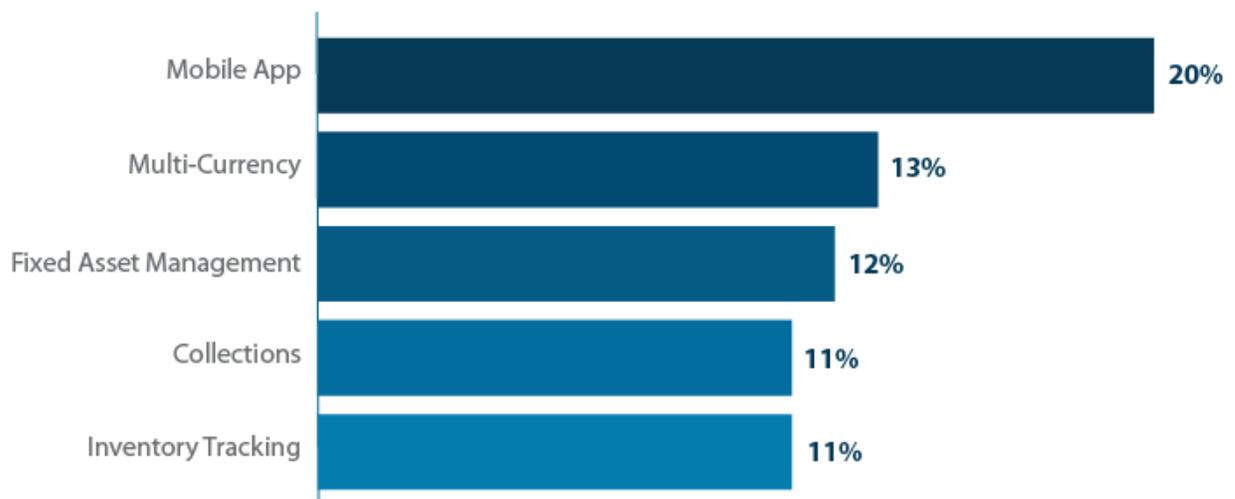
("Accounting Software User Research Report," 2015)

The five features that are presented in Table 3 are found within a multitude of

accounting software. I have provided my own definitions for each of these features to allow

the reader a better understanding of the terms. It is important for a user to conduct a

cost/benefits analysis where they identify the features that are necessary and those that are

not.

Mobile App: An application that allows the user to interact with the cloud software

through their cellphones or tablets.

Multi-Currency: The ability to create invoices, send and receive payments, and

produce reports in multiple foreign currencies.

Fixed Asset Management: A feature that allows for fixed assets to be tracked over

their useful life and have depreciation automatically applied in accordance to the IRS.

Collections: Having the system keep track of overdue accounts receivable and

automatically sending out reminder e-mails to the owners of the accounts.

Inventory Tracking: Being able to track inventory amounts through the automatic

updating of the system after each invoice is submitted.

POPULAR SOFTWARE ON THE MARKET

With knowledge of the advantages and disadvantages of cloud accounting, it is now

important to discuss the different potential software options for businesses to choose from.

Utilizing Capterra's database and sorting feature, it was shown that three of the most popular

cloud based options for accounting are QuickBooks Online, FreshBooks, and Xero. This

section will take an in-depth look at each software offering based on the information

discussed previously.

Intuit QuickBooks Online

Released: 2001

Server Locations: Intuit has data centers around the globe, but they are primarily located in the United States.

Table 4
Select Features of QuickBooks Online

	Self-Employed	Simple Start	Essentials	Plus
Price	$10/Month	$15/Month	$35/Month	$50/Month
Number of Users	1	1	3	5
Mobile App	✓	✓	✓	✓
Multi-Currency			✓	✓
Fixed Asset Management				
Collections				
Inventory Tracking				✓

Data from Table 4 was extracted from QuickBooks's website pertaining to mobile applications ("Mobile Accounting," 2017), with the remainder coming from personal QBO experience.

Models: Table 4 organizes QuickBooks Online into its four different models: Self-Employed, Simple Start, Essentials, and Plus. The different models for QuickBooks online are related to the form of business that is being done. The Self-Employed model is built for independent contractors and is the only model that provides the feature to track miles. Simple Start is for a service based startup that does not have multiple accounting users or have a large amount of billing since it lacks the bill management feature. Essentials is for the larger service based startup that have begun to grow. Plus is the package needed for any user that runs a business through the sale of inventory goods since it is the only model that tracks inventory.

Users: Every model, except for the Plus model, is set to the user limit specified in Table 4. However, if a business needs more than five users and they have the Plus model, then they can contact Intuit to have up to 20 additional users added for extra fees. The models that include multiple users also contain user permission features that allow for the restricting of access for certain users.

Security Measures: QuickBooks Online is protected through VeriSign and Norton Symantec. These services manage the login feature, firewall, and 128-bit encryption of QuickBooks Online. Intuit has also been licensed by the TRUSTe Privacy Program ("Security," 2017).

Mobile App: QuickBooks's mobile app includes the capability to "create, view, and email estimates, invoices, and sales receipts; access customer information; convert estimates to invoices, receive payments, track expenses, download and reconcile bank transactions, and use your custom QuickBooks Online forms" ("Mobile Accounting," 2017).

Multi-Currency: Multi-currency is only available in the Essentials and Plus models. When activating this feature, the user will have to select a home currency and will not be able to change that selection after it is submitted. From that point on, all documents will be reported in the home currency and the selected foreign currencies.

Fixed Asset Management: None of the QuickBooks Online models contain fixed asset management features. The user is able to create specific fixed asset and depreciation accounts, but the depreciation must be done by hand and there are no depreciation schedules.

Collections: While QuickBooks Online does supply a collections report and aging summaries, there is not a feature to have the system automatically send out collection e-mails

to customers.

Inventory Tracking: The Plus model is the only one that features inventory tracking. The system tracks inventory with the FIFO method and also supplies inventory reports to allow the user to see inventory valuations and gross profit per product at all times.

FreshBooks

Released: 2004

Server Location: FreshBooks utilizes Rackspace for their hosting services. They have four servers located in the United States, one in the United Kingdom, one in China, and one in Australia ("Security and Reliability Safeguards," 2017).

Table 5
Select Features of FreshBooks

	Lite	Plus	Premium
Price	$15/Month	$25/Month	$50/Month
Mobile App	✓	✓	✓
Multi-Currency	✓	✓	✓
Fixed Asset Management			
Collections	✓	✓	✓
Inventory Tracking			

Data in Table 5 was extracted from FreshBooks's website and reviews pertaining to price (A Product that Pays for Itself," 2017), users (Krause, 2017), mobile application ("Work Anywhere with the FreshBooks Mobile App," 2017), and collections ("All the Features that make FreshBooks Ridiculously Easy to Use," 2017).

Price and Models: Table 5 organizes FreshBooks into its three different models. They offer Lite, Plus, and Premium for $15, $25, and $50 a month respectively. There is also the option to have an annual fee instead of a monthly one for a 10% discount. As seen in Table 5, each model provides the same functionality and features. The only difference between each model is the number of active clients that can be billed. The Lite model can have 5, Plus can have

50, and Premium can have 500 (A Product that Pays for Itself," 2017).

Users: FreshBooks starts with only allowing 1 user. There is an extra $10/Month for each additional user that you wish to add. The software does not offer user permissions to distinguish what each user can do in the software (Krause, 2017).

Security Measures: FreshBooks encrypts its data through the use of 256-bit SSL encryption. Data is also protected with Cisco powered firewalls and is regularly scanned for intrusions by AlertLogic technology ("Security and Reliability Safeguards," 2017).

Mobile App: FreshBooks's mobile app is in line with its competitors. It provides features to create and send invoices, upload images of receipts, manage expenses, track time, and respond to customers ("Work Anywhere with the FreshBooks Mobile App," 2017).

Multi-Currency: FreshBooks provides multi-currency functionality. Although a default currency is selected for your account during setup, currency can be changed for individual invoices ("How Do Multiple Currencies Work in FreshBooks?" 2017).

Fixed Asset Management: FreshBooks does not offer fixed asset management built into its software. Depreciation has to be calculated and recorded manually.

Collections: In comparison to QuickBooks Online (Table 4) and Xero (Table 6), FreshBooks is the only option that provides a collections feature in its software. The user can customize up to three different messages that will be sent to an overdue customer over a certain period of time ("All the Features that make FreshBooks Ridiculously Easy to Use," 2017).

Inventory Tracking: FreshBooks does not provide an inventory tracking feature in its software.

Xero

Released: 2006

Server Location: Xero servers are located in the United States through third party data

hosting providers Rackspace, AWS, and Microsoft Azure ("Privacy Policy," 2017).

Table 6
Select Features of Xero

	Starter	Standard	Premium
Price	$9/Month	$30/Month	$70-180/Month
Mobile App	✓	✓	✓
Multi-Currency			✓
Fixed Asset Management	✓	✓	✓
Collections			
Inventory Tracking	✓	✓	✓

Data in Table 6 was extracted from Xero's website pertaining to price ("Xero Product Plan
Comparison," 2017), users (Fraser, 2017), mobile application ("Xero Mobile Accounting
App," 2017), multi-currency ("Multi-currency Accounting in Xero," 2017), fixed asset
management ("Asset Management in Xero," 2017), and inventory tracking ("Manage
Inventory, Stock, and Items in Xero," 2017).

Price and Models: Table 6 organizes Xero into the three different models that it provides for

its cloud accounting services. The difference in price between the Starter, Standard, and

Premium models is due to limitations on sending invoices, entering bills, reconciling bank

transactions, and processing payroll. The Starter model only allows the user to send five

invoices, enter five bills, and reconcile twenty bank transactions. The other models are

completely uncapped. The Starter model also does not include payroll, while the Standard

allows up to five employees and the Premium can range from 10-100. Aside from that,

almost all features are streamlined across each model ("Xero Product Plan Comparison,"

2017).

Users: Xero stands out from its competitors due to the fact that it offers the capability to

have an unlimited amount of users across all of its models. Each user is also given certain

permissions, so each person can have a certain amount of control and limits (Fraser, 2017).

Security Measures: Xero utilizes Advanced Encryption Standard (AES) 256-bit encryption

to encrypt data at rest and industry standard Transport Layer Security (TLS) to encrypt it

while it is being transferred. Xero also provides firewall, intrusion detection, and network

segregation services through third party security providers ("Security at Xero," 2017).

Mobile App: The Xero mobile app allows for the user to reconcile bank transactions, capture

and approve expenses, create and send invoices, and communicate with customers.

Permissions can also be setup for users on the mobile app ("Xero Mobile Accounting App,"

2017).

Multi-Currency: As seen in Table 6, multi-currency is the only feature that differs across

the models. Xero only offers multi-currency on its Premium plan. It allows the user to do

business in over 160 different currencies. Currency preferences can be made for separate

customers and different currency bank accounts can be added alongside the user's local bank

account. Reports can be displayed and changed to different currencies with exchange rates

that are updated hourly ("Multi-currency Accounting in Xero," 2017).

Fixed Asset Management: In comparison to QuickBooks Online (Table 4) and FreshBooks

(Table 5), Xero is the only option of the three that offers fixed asset management. Xero offers

the ability to keep track of the company's fixed assets and can depreciate them automatically.

When a fixed asset is put into the system, the user can choose between the straight line

method and the declining balance method. All the user has to do is set the date for when the

system needs to run depreciation ("Asset Management in Xero," 2017).

Collections: Xero does not supply collection reports to show overdue accounts receivables or supply functionality for automatically sending out collection e-mails.

Inventory Tracking: Xero allows their users to keep track of how much inventory is on hand and what items are the most profitable through real time updating and comprehensive reports ("Manage Inventory, Stock, and Items in Xero," 2017).

THE ROLE OF THE ACCOUNTANT

More of an Advisor

The American Accounting Association defines accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information" (American Accounting Association, 1966, p. 1). Put simply, accountants are in charge of collecting and processing data and analyzing and communicating the information that is produced from it. With the introduction of cloud computing, and other forms of technology, the collecting and processing of data is becoming more automated. This means that there will be less demand for data entry by accountants. Instead, accountants will be relied on more for their skills of analyzing and communicating information. Although technology has become more advanced, it is still only at the level of being utilized as a decision making assistant. Business owners will still need someone to help explain what the different reports are saying and the best course of actions that are to be taken because of them. Due to this shift, accountants in charge of bookkeeping and financial statement analysis will be seen more as advisors within a company and less as data entry clerks. This will be beneficial to both business owners and accountants alike.

Sumit Agarwal, managing director at Nomisma (a UK cloud based accounting software),

puts it best when he says, "Freeing accountants from data entry and the laborious chasing up

of documents and the admin that entails, means they are able to do what they're trained to do:

to explain and work with the figures, and to allow them specifically to address the issue of

business growth" (Huber, 2016, para. 15).

CONCLUSION

Cloud accounting software has come a long way since its first inception. A software

solution that was seen a few years ago as inferior to its desktop counterpart has made great

strides to be a replacement solution for desktop applications. While there are still concerns

about cloud computing, most of them have been addressed in recent years. Cloud accounting

can be seen as a secure option, both digitally and physically, that provides cost savings,

convenience, and a user friendly interface. While the ultimate decision of implementation

falls to the user, the three providers discussed in this thesis all market their software to SMEs.

I believe that these are the companies that can receive the most benefit from cloud

accounting software at this moment. I believe most cloud solutions on the market right now

lack the depth in inventory systems and industry specific features that are required for these

solutions to excel within a larger, inventory based organization, or firms that require industry

specific solutions. The users that receive the most benefit are service based, or limited

inventory based, organizations that are seeking a convenient and accessible accounting

software.

Future research on this subject can take a look at how further advancements in cloud

accounting software, OCR, and AI can be combined within the cloud infrastructure. One of

limitations of OCR is that it struggles with unformatted and handwritten images. In recent

years, Google has made great strides in advancing the capabilities of OCR within their

Google Translate software. A recent update to Google translate allows the user to translate

everyday objects through their phone's camera. However, the technology is not yet

dependable at the level required for businesses who require accurate translations from OCR.

REFERENCES

A Product that Pays for Itself. (2017). Retrieved October 13, 2017, from

https://www.freshbooks.com/pricing

Accounting Software User Research Report. (2015, Summer). Retrieved October 23, 2017,

from https://www.capterra.com/accounting-software/user-research

All the Features that Make FreshBooks Ridiculously Easy To Use. (2017). Retrieved October

13, 2017, from https://www.freshbooks.com/features

American Accounting Association. (1966). A Statement of Basic Accounting Theory.

Evanston, Ill.: American Accounting Association, 1.

Asset Management in Xero. (2017). Retrieved October 13, 2017, from

https://www.xero.com/us/features-and-tools/accounting-software/fixed-asset-

management/

Cloud Computing: A Matter of Survival for the Accounting Industry. (2013, April).

Retrieved October 23, 2017, from https://www.cch.com.au/DocLibrary/CCH-

Research-2013-Cloud-computing-a-matter-of-survival-for-the-accounting-

industry.pdf

Defelice, A. (2010, October 01). Cloud Computing: What Accountants Need to Know.

Retrieved June 03, 2017, from

http://www.journalofaccountancy.com/issues/2010/oct/20102519.html

Drew, J. (2015, March 01). Accounting Firms Moving Slowly Toward Cloud. Retrieved June

04, 2017, from http://www.journalofaccountancy.com/issues/2015/mar/cloud-

accounting-software-cpa-firms.html

Fraser, S. (2017, March 21). Limits for Number of Users? Retrieved October 13, 2017, from

https://community.xero.com/business/discussion/45933010

Gelinas, U. J., Dull, R. B., & Wheeler, P. R. (2015). Accounting information systems (E ed., Vol. 10). Stamford, CT: Cengage Learning.

How Do Multiple Currencies Work in FreshBooks? (2017). Retrieved October 13, 2017, from https://www.freshbooks.com/support/how-do-multiple-currencies-work-in-freshbooks

Huber, N. (2016, September 21). The Impact of Cloud Computing. Retrieved October 16, 2017, from https://www.icas.com/ca-today-news/what-does-cloud-computing-mean-for-the-accountancy-profession

Krause, C. (2017, March 20). FreshBooks Review 2017 | Reviews, Ratings, Complaints, Comparisons. Retrieved October 13, 2017, from https://www.merchantmaverick.com/reviews/freshbooks-review/

Laudon, K. C., & Laudon, J. P. (2018). Management Information Systems: Managing the Digital Firm (15th ed.). Harlow, England: Pearson.

Lee, D. (2016, March 08). KPMG Recruits IBM Watson for Cognitive Tech Audits, Insights. Retrieved October 18, 2017, from https://www.accountingtoday.com/news/kpmg-recruits-ibm-watson-for-cognitive-tech-audits-insights

Ma, X. (2015). The Adoption of Cloud Computing for Small and Medium Accounting Firms (Unpublished master's thesis). University of Canterbury.

Machine Learning: Unlocking the Power of Millions for the Prosperity of One. (2017). Retrieved November 14, 2017, from https://quickbooks.intuit.com/blog/innovation/machine-learning-unlocking-the-power-of-millions-for-the-prosperity-of-one/

Management of Accounting Practice Survey. (2015, March). Retrieved October 23, 2017,

    from

    https://www.journalofaccountancy.com/content/dam/jofa/issues/2015/mar/exhibits-

    2014-aicpa-pcps-map-survey.pdf

Manage Inventory, Stock and Items in Xero. (2017). Retrieved October 13, 2017, from

    https://www.xero.com/us/features-and-tools/accounting-software/inventory/

Moving your Practice to the Cloud. (2017). Retrieved October 12, 2017, from

    https://www.xero.com/us/accountant-bookkeeper-guides/cloud-accounting/move-

    accounting-practice-to-cloud/

Multi-currency Accounting in Xero. (2017). Retrieved October 13, 2017, from

    https://www.xero.com/us/features-and-tools/accounting-software/multi-currency/

Panno, K. (2016, December 1). Big Banks Take On PayPal's Market Share In Mobile

    Payments. Retrieved October 12, 2017, from

    https://marketintelligence.spglobal.com/our-thinking/ideas/big-banks-take-on-paypal-

    s-market-share-in-mobile-payments

Pepe, A. A. (2011, April 19). The Evolution of Technology for the Accounting Profession.

    Retrieved June 02, 2017, from

    http://www.cpapracticeadvisor.com/article/10263076/the-evolution-of-technology-

    for-the-accounting-profession

Press Releases. (2013, September 23). Retrieved November 05, 2017, from

    https://www.intuit.com/company/press-room/press-

    releases/2013/IntuitLaunchestheCompletelyNewQuickBooksOnline/

Privacy Policy. (2017). Retrieved October 13, 2017, from

https://www.xero.com/us/about/privacy/

QuickBooks Comparison Chart. (2006). Retrieved November 05, 2017, from

https://quickbooks.intuit.com/commerce/compare/compare_landing.jsp?priority=Low

QuickBooks Desktop Comparison Chart. (2017). Retrieved November 05, 2017, from

https://enterprisesuite.intuit.com/products/enterprise-solutions/comparison-charts/

Schmidt, M. (2017, October 15). Accountant, Accounting Profession, Role Requirements

Explained. Retrieved October 16, 2017, from https://www.business-case-

analysis.com/accountant.html

Security. (2017). Retrieved October 13, 2017, from

https://quickbooks.intuit.com/global/security/

Security and Reliability Safeguards. (2017). Retrieved October 13, 2017, from

https://www.freshbooks.com/policies/security-safeguards

Security at Xero. (2017). Retrieved October 13, 2017, from

https://www.xero.com/us/about/security/

Work Anywhere with the FreshBooks Mobile Apps. (2017). Retrieved October 13, 2017,

from https://www.freshbooks.com/mobile-apps

Wyle, D. (2007, July 16). Automating Tax Preparation with OCR Technology. Retrieved

October 18, 2017, from

https://www.aicpastore.com/Content/media/PRODUCER_CONTENT/Newsletters/Ar

ticles_2007/CPA/June/OCR_Technology.jsp

Xero Business Help Center. (2017). Retrieved October 23, 2017, from

https://help.xero.com/us/ImportExport

Xero Mobile Accounting App. (2017). Retrieved October 13, 2017, from

https://www.xero.com/us/features-and-tools/mobile/xero-touch/

Xero Product Plan Comparison. (2017). Retrieved October 13, 2017, from

https://www.xero.com/content/dam/xero/pdf/US-

PartnerToolkit/XeroProductPlanComparison.pdf