PREPARING THE FUTURE ACCOUNTING PROFESSIONAL FOR A RAPIDLY CHANGING WORLD

by

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ABSTRACT

Whether a CPA is working in public accounting or industry, one thing is clear: they must prepare for a changing environment. Disruptive technologies (such as artificial intelligence, data analytics, robotics process automation, and blockchain), are leading this change. They are not only affecting accounting professionals, but they are also impacting other professions and industries. The accounting professional will need to adapt and learn new skills required to master these technologies.

This study will examine the skills accountants will need in this new age of technology. The study will also develop some guidelines regarding the training accounting students will need to be successful. CPAs and accounting professionals in both public accounting and industry were surveyed regarding their knowledge and use of these changing technologies. They were also asked to share how they are currently addressing these technologies in their work environment. In addition, these professionals have provided guidance regarding the skills that future students will need as they enter the accounting profession and confront these different technologies. The results show that while new skills are definitely needed, many of the current skills that students learn are still required.

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LITERATURE REVIEW

CPA's today

The jobs of accountants are to collect, record, and analyze financial information. Some accountants advise clients based on the data that they analyze. According to the American Institute of Certified Public Accountants (AICPA), the core skills an accountant needs are "communication skills, leadership skills, critical thinking/ problem solving skills, anticipation skills, creating relevant information from data, and collaboration skills" (AICPA). These skills need to be reflected in the roles that the Institute of Management Accountants (IMA) claims as management accounting roles. These roles include "cost reduction, generating cost information, setting standards, improving processes, and reducing risk" (Clinton). Accounting is not as specific as one might think. There are many different skills and roles of CPAs which many students are unaware of.

CPAs can have jobs focused in administration, advisory services, auditing, financial planning, general accountancy, law, non-accounting, taxation, and more. Which specific job a CPA has, most likely depends on whether they are in public accounting or industry. In North Carolina, 39% of CPAs work in public practice and 47% work in industry (Activity Review). Public accounting works with many different clients. Someone who works in this area will see a wide range of businesses and needs to be adaptable. Industry is when the CPA works for a specific firm and tracks its finances. Working in industry is beneficial because one can typically choose which industry they want to work in, and it is more likely that they will see the impact that they are making. (Skoulding)

Whether a CPA is working in public accounting or industry, one thing is clear: disruptive technologies will have an impact on work. "The accounting profession is heading into the greatest period of change and disruption is has ever seen" (Drew). Ordinarily, when people talk about disruptive technologies, they talk about all of the jobs that will be taken over by machines. Technology has a negative connotation in the workplace because people have a fear of being let go and replaced by a machine. However, this is not the case, but rather the complete opposite. Technologies are taking away mundane tasks of CPAs and allowing them to focus on more important tasks. Technologies can help shape careers and allow CPAs to be more strategic and solution-oriented. (Morehouse) CPAs should not be fearing technology, they should be embracing it.

Future Skills

The four disruptive technologies that are not only affecting the accounting profession but are also impacting many clients and industries are artificial intelligence, data analytics, robotics process automation (RPA), and blockchain (See Appendix A). Because the world is constantly evolving and adapting to changes in its environment, every industry needs to accept the changes that are occurring and utilize them to stay relevant. The accounting profession is facing many challenges and opportunities stemming from these four disruptive technologies that are

impacting its growth and innovation. The accounting professional must use these technologies to their advantage and develop ways to implement them.

To implement these technologies in the most efficient way possible, the accounting professional must be prepared to alter the skillsets necessary for the job. One company in particular is already looking to teach the future employees of accounting. KPMG has created a Master of Accounting with Data and Analytics Program to address these disruptive technologies. There are nine universities participating in this new program to develop students for the future. KPMG has created this program to incorporate the specific skills, use of technology, and experience anticipated to be needed in the future. (McCabe) More firms need to prepare for the anticipated changes in order to stay, or become, pertinent in the accounting world.

The new skills accountants will need with this new age of data and technology comes in a wide variety. They will need both increased people skills and increased technological skills— depending on how the person makes use of the disruptive technologies. An increase in people skills will be necessary for accountants that will review the information after technologies have analyzed and interpreted the data. The extra time that accountants will gain from the automation of services, will give them more time to spend with their clients. This increased time with clients can strengthen the relationship. Accountants will be able to consult and help their clients make better decisions. Having more time to examine the information derived from the data as well as information about the business and industry, will allow for more informed and therefore better decisions. A stronger accountant to client relationship may also give the accountant an incentive to give even better advice. The accountant could be more willing to help someone that they have a personal relationship with. (Are you ready) (Tysiac)

Accountants will also need increased technological skills, some being more advanced than others. In the more advanced category, there will be two new types of employees. One is a "data scientist" and the other is a "big data engineer" (Drew). The data scientist is more technical and would need to be able to program with large amounts of data. Then, the scientist should be able to put the information together into a presentation for visualization. This role will be essential to keeping the firm's technology up to date. These big data engineers will be experts in software products that incorporate data mining and statistical analysis. The engineers will also need to be able to program and be involved in either data transformation, data collection services, or data warehousing. (Drew) The idea of these new types of employees should "encourage [accounting students] to throw in a computer science minor or math minor – something that's going to give [the students] that logic and help [them] think in code" (Drew). Although the computer science background would not be required for future accountants, it would be helpful to understand the processes.

Whether an accountant has a background in computer science or not, they should still develop technological skills in order to understand how the processes will work. The accountant may not be responsible for programing technologies, but they will still be responsible for monitoring and determining "whether they perform effectively" (Tysiac). Current accountants may show resistance to the new technological system because they are comfortable with the current, traditional process (Are you ready). However, that just proves to show another skill required in the future of accounting— adaptability. Adaptability is essential in a constantly

evolving technological world. The amount of opposition to a new skillset and new innovations will affect the amount of impact disruptive technologies can have on the industry.

Jobs that were previously entry-level, are now being eliminated due to advances in technology. Accounting professionals no longer have to wade into the industry because technologies are performing the simple, beginner tasks. The industry is now looking for people with technological skills and higher level thinking skills. New accountants will have to be taught the old skills, as well as the new skills required. Current accountants will have to learn the new skills to stay valuable as employees. Accounting students today should look to take courses in data analytics and/or computer science. The more proactive the student is about learning the four disruptive technologies, the more success the student is likely to have.

RESEARCH STUDY

Questions

The big idea of our research study is to understand how the accounting profession is responding to technological disruptors. With this purpose, our research questions are:

1. What impact will innovations with artificial intelligence, data analytics, robotics process automation (RPA), and blockchain have on the accounting profession?
2. Will the current skillset of CPAs still be needed in 10-15 years or will an entire new skillset need to be taught?

Methodology

As the fields of artificial intelligence, data analytics, robotics process automation (RPA), and blockchain are evolving in the life of the CPA, the research questions will need to be answered with reviews of current literature, analysis of current practices in the field, and a survey of individual practitioners currently implementing these changes within their workplace. These three different methods of collecting information will form the data collection for answering the research questions.

An anonymous, online open-ended survey will be used to gather information from account professionals and CPAs in both public accounting and industry (See Appendix B). Using an open-ended survey allows us to gather qualitative data that could be unique to our original findings. When comparing answers of different respondents, we were able to find similarities and differences. An anonymous survey was essential in our research so as not to make any potential respondent uncomfortable when giving out information about their workplace.

Results

We had 24 respondents take the survey and answer our questions to the best of their ability. Of the respondents, 13 were public accounting, 8 were industry, and 3 were unknown. The survey findings confirmed the findings in our literature review. Every person that answered question 5 believed that the skillset of future accountants needed to be adjusted to incorporate technologies. One respondent even went as far as to say that a background/minor in IT would be essential in becoming a competitor in the accounting profession. However, with this knowledge of technology, students must also have the skills of critical thinking and communication. Another, separate respondent stated that it would be more important for future accounting graduates to learn how to adapt than it would be to learn the new technologies. Technologies are constantly changing, and the respondent stated that teaching a student a technology that will not be deployed for another 5 years, is not of great use. There are mixed opinions on how much technology should be taught to future accounting professionals. But most are in agreement that the

interpersonal skills and higher level thinking skills are still essential to the skillset of an accounting professional.

Critical thinking goes hand in hand with having greater knowledge of technology. According to a respondent, accountants must understand the technologies well enough so that they are also able to use critical thinking to decide if the technology is being efficient and working properly. Students will need analytical skills to analyze data and then draw conclusions. Arguably most essential, students will need strong verbal and written communication skills in order to deliver those conclusions to their clients. Strong communication is also necessary for advisory skills. Since automation is eliminating basic level data entry in accounting, students need to be taught higher level advisory skills to make decisions.

Ultimately, through the various research conducted, it is clear that artificial intelligence, data analytics, robotics process automation (RPA), and blockchain will have an impact on the accounting profession. However, some are currently having a greater impact than others. Of the 24 respondents, 17 explicitly stated that their firm or company is currently using data analytics. 11 respondents said that they are using artificial intelligence, while only 6 said they were taking advantage of RPA, and a mere 2 are utilizing blockchain. The implementation of these technologies within the accounting profession is slowly emerging. Based on the responses of those surveyed, the majority of firms and companies are looking into the usage of one or more of these technologies. With this awareness, future accounting graduates will need to learn new skills in order to stay competitive in 10-15 years. The current skillset of accounting professionals and CPAs will still be needed in the future—debits and credits remain the same, leadership and communication skills will still be essential. However, students will need to be taught advisory, communication, critical thinking, and analyzation skills to a greater extent. The picture is not black and white— students will need to interpret and give valid advice to clients based on information that technologies give them. The future accounting professional will need an understanding of current accounting skills, along with a greater understanding of technology. According to the majority of respondents, mastery of the technologies is not necessary. But an understanding of what they are and what they do is essential in order to utilize the technology to the best of its ability.

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APPENDIX

Appendix A

Disruptive Technologies

Artificial Intelligence (AI):

Artificial intelligence occurs when computers seem as if they have the same intelligence as a human. The machine can draw conclusions based on large amounts of data. Artificial intelligence is created by showing the machine thousands of scenarios until eventually the machine understands it. The pitfall of AI is that the machine only knows what it has been shown and trained to know. However, AI can use machine learning to improve itself, much like a human would learn from their mistakes. If it does not know the answer the first time, it may learn and know it if asked in the future. Even with the downfalls to AI, there are far more benefits to the technology. AI helps to accomplish more in less time than it would take a human to do the same task(s). The advantage of using AI is that it can complete the simple tasks of a job and therefore free up time for humans. (McCann) With this free time, employees can focus on the more advanced tasks of a job, making the overall job more efficient and accurate. AI also allows for employees to have a more personal relationship with their clients because of the increased amount of time they have (Tysiac).

AI in the accounting industry will help employers/employees as well as clients. One question a firm must ask itself before continuing with its services is: "Will your firm be a disrupter, or disrupted [by AI]" (Esposito). By taking advantage of AI now, in its early stages, a firm can be a disrupter. The firm can use AI to reduce mistakes and biases that were previously caused by humans. With AI, jobs will be transformed and redefined to be more cost effective. If firms do not acknowledge the advancements to AI, they will find themselves disrupted and therefore left behind. (Esposito)

Being a Big Four firm, KPMG has been anticipating and improving on their technological services for years. At the root of its use, AI at KPMG is being used to enhance client experience by giving more accurate and consistent advice based on the information. KPMG Ignite is their portfolio for artificial intelligence that attempts to customize AI solutions to their clients. KPMG uses AI to complete mundane tasks, inform accountants of relevant information, and speed up/ improve the process of complex business decision-making. KPMG partners with technology-based companies such as Google and Microsoft to help keep their AI up to date. The firm believes that AI is only as successful as the humans behind it and both machines and humans must constantly evolve create a system that benefits the client. (KPMG Artificial Intelligence).

Artificial intelligence will not replace accountants, but rather enhance their knowledge. At its simplicity, AI can book appointments with a firm. Customers can speak to an automated voice that can confirm appointments and send reminders. At the more complex side of things, AI can speed up the process of receiving information. Eventually, there will be practically no time

between business operations/transactions and the accounting information received on it. Teaming with data analytics, artificial intelligence will be able to perform "continuous accounting" (Patil). Firms and advisory companies will be able to improve customer experience through AI with a new, speedier process that is also more accurate and efficient. This new process with attempt to increase profitability and growth. With the utilization of AI, the future skillset of accountants will need analyzation and communication skills.

Data Analytics:

Big data analytics is the process of transforming, modeling, and analyzing large amounts of data. It is used in many different industries, with many different types of information. Data analytics is often partnered with Artificial Intelligence to create relevant information from the data. The purpose of data analytics is to review large amounts of data at 100% capacity, rather than a sample of data, and look at the trends to make conclusions that lead to smart decisions. Accounting is starting to become part of the big data analytics movement. Auditors are beginning to use big data analytics to inspect data from financial statements. It allows them to "dig deeper into the data by processing much larger volume of data" (Hood) Predictive models are being used to make budget predictors, financial forecasts, and trend analyses. (Master's in Accounting) The conclusions auditors can come to from analyzing big data will help them to better inform their clients for decision making.

Overall, big data analytics will improve an auditor's ability to assess risks because they will be looking at all of the data rather than samples. This will also give them the opportunity to understand their clients' organizations or companies better. The auditor to client relationship will become more personal because the process will be faster due to automation by the computer. Rather than focusing on sampling data, auditors will get to focus on the client. According to Tom Hood, Maryland Association of Certified Public Accountants (MACPA) chief, communication and collaboration are becoming increasingly more important skills next to tech savviness and data analytic skills (Are you ready). Auditors will need to guide their clients and management on decisions based on the numbers that predictive models show.

Robotics Process Automation (RPA):

Robotics Process Automation, or RPA, is an automation technology involving software robots that mimic the actions of a human to perform business operations with the use of artificial intelligence and machine learning (Del Rowe, Galusha). These robots complete repetitive tasks through automation in a faster manner than a human would. Tasks include: responding to emails and customer queries, copy and pasting data, transferring data, website scraping, and more. Many companies are starting to use RPA to eliminate simple, time-consuming tasks. As recognized by KPMG, Robotics Process Automation had many advantages. The main advantaged includes speed, accuracy, cost reduction, security, efficiency, and customer satisfaction (Del Rowe).

Blockchain:

Although blockchain was invented more than 30 years ago, it is just recently becoming a trend in the business world. Blockchain is quite literally a chain of blocks that contain information. The idea behind this concept is to keep information as confidential and secure as possible. Each block has its own, unique "hash" which is a set of random numbers and letters. The next block that is connected, contains the previous blocks hash, as well as its own. If something were to change with the data in a block, a new hash is then formed. A hacker cannot tamper with a block because if they change one block, they have to change each of the other individual blocks connected in order for them to have the correct previous hash to be valid. (Kharpal, Hood)

Blockchain in the accounting industry is starting to make its mark. EY and PWC are now accepting Bitcoin as a payment method (Vetter). Although KPMG is not doing that, it is researching the applications of blockchain with Microsoft. They define blockchain capabilities as "providing faster and more secure transactions, streamlining and automating back office operations, and reducing costs" (KPMG and Microsoft). KPMG now has a strategic alliance with Microsoft. Microsoft will provide the cloud for Blockchain and KPMG will provide its services. (KPMG and Microsoft). Due to the improvement in transparency of supply chain operations in blockchain, accounts payable and accounts receivable functions will optimize (Maslova). There will be one set of books, rather than one for the buyer and seller—due to the increased level of trust. Blockchain is becoming increasingly important in the accounting industry and the trust and transparency will transform the way business conduct and analyze transactions.

Appendix B

Survey Questions

1. Do you work in Public Accounting or Industry?
2. How familiar are you with any of the following four disruptive technologies?
    a. Artificial Intelligence,
    b. Data Analytics,
    c. Robotics Process Automation (RPA), and
    d. Blockchain
3. Has your firm or company began to utilize these technologies within your firm or company? If so, in what way?
4. Have your clients or customers began utilizing these technologies within their firm or company? If so, in what way?
5. Do you believe that the skillset of future accounting graduates will need to be different than they are today? If so, what does a current graduate need to be taught in addition to a typical accounting curriculum?
6. Would you be willing to share any specific examples of what you or your firm is doing with these technologies?
7. Are your firm or company employees being trained in any of these new technologies?