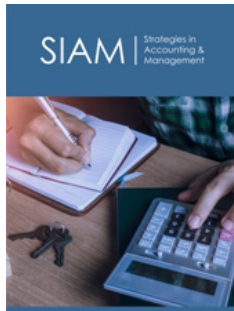Review Article

Transformational Technologies in the CPA Profession and Business: What is the Role of the Accounting Academy?

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Abstract

Much innovation is occurring in the public and private accountancy professions. In this article, we describe the most high-profile innovations and provide examples of how these innovations are already impacting the CPA profession. Most importantly, we implore accounting program leaders and professors to support development of these skill sets in our CPA-trained students. The goal of the manuscript is to accelerate recognition across the accounting academy regarding the role of the transformational technologies in the practice of accounting and then motivate development of instructional pedagogy aimed at developing these skills in accounting students.

Introduction

A great deal of technology innovation is occurring in the public and private accountancy professions. In this article, we summarize and categorize the most high-profile innovations, examine how these innovations are already impacting the CPA profession, and encourage the accounting academy to support development of these skill sets in our CPA-trained students. We hope that this introduction will help academics less familiar with the technologies gain awareness. We then hope that faculty across the world will work to support development of accounting course modules that include exposure to these technologies. An especially important reason for CPA-candidates to have these skills is that the technologies discussed in this article are or will soon be widely used in the Audit. It would be suboptimal for CPA firms to have to rely upon non-CPAs for work with these technologies as output from these technologies will be central to the support for the audit opinion. Similarly, tax planning and compliance will employ these technologies at an increasing rate. Again, it would be best that the accounting students present at these firms with the accounting knowledge as well as cutting-edge technological skills. We argue that this can be accomplished. Finally, vast consulting opportunities will arise for CPA firms skilled in the development, implementation, and use of these technologies. We hope that the majority of consulting engagements around the technologies will be carried out by students with both core accounting knowledge and the technology skills. In the remainder of this paper, we focus on four genres of innovation: Robotic Process Automation; Data Analytics; Artificial Intelligence (AI) and Block Chain. Since all these genres involve technology, cybersecurity implications are present as well.

Robotic process automation and the CPA profession

The AICPA defines Robotic Process Automation (RPA) as "a set of capabilities of software automation that can handle high-volume, repeatable tasks such as answering questions, making calculations, maintaining records, and recording transactions [1]. When technology experts refer to "bots", they are speaking of programmed Robotic Process Automations. CPA firms and companies use RPA software to accurately and efficiently complete tedious

tasks including data input, processing, and output across formerly disconnected processes. Cooper et al. [1] conducted interviews of CPA firm leaders to learn how firms are using RPA. They found that tax services are the furthest along in adoption of RPA followed by advisory services and then assurance services. RPA adoptions are increasing both the effectiveness and efficiency of operations for companies. As a result, accounting firms are creating new service lines helping clients implement RPA at their companies. They also note that lower level staff are driving the development and adoption of RPA software. This is associated with higher employee satisfaction measures for all staff and faster promotion rates for staff involved in RPA development.

This is an outstanding development for the profession, as it will greatly enhance the attractiveness of the profession in the eyes of young professionals. Finally, respondents indicate that RPA are serving as a "stepping-stone" to more sophisticated automation. The following is just one of many examples of the money-saving and accuracy-enhancing power of RPA in practice. This solution was created by Deloitte for an advisory client. The client previously employed a team of accountants to analyze work-in-process inventory. The team consisted of ten employees that collectively completed approximately 24,000 analyses per year. Each analysis required approximately 10-15 minutes (i.e., 4,000 - 6,000 hours in total per year). The RPA automated two tasks. First, the RPA continuously ensures that the Enterprise Resource Planning (ERP) system is up to date. Second, the RPA prepares the work-in-process analyses described above. When the "bot" receives a request, it logs into the ERP and runs a work-in-process report. The "bot" downloads the data into a spreadsheet file, executes a macro to create pivot tables, finalizes the analysis and emails it to the requesting analyst. Again, this is work that was previously completed by a team of ten employees. Further, it would likely not have been described as professionally fulfilling tasks. These professionals are not freed to perform other more value-creating tasks. See Deloitte (2019) for additional details.

Data analytics and the CPA profession

Data analytics in the context of business refers to the process of evaluating data to inform business questions. Analytics generally fall into four categories: Descriptive; Diagnostic, Predictive; and Prescriptive. Descriptive analytics provide insight on past information. Diagnostic analytics seek to explain the causes of past outcomes. Predictive analytics identify patterns in historical data to inform predictions of future outcomes. Prescriptive analytics assist in decision making among options via optimization techniques and machine learning. Many veteran accounting faculties are familiar with the descriptive and possibly the diagnostic aspects of data analytics. Indeed, many are likely using these analytics. However, the greatest potential for profession-altering outcomes around data analytics relates to the predictive and prescriptive analyses that inform "what will happen" and "which course of action should the company take" questions.

CPA firms are using data analytics extensively to enhance the quality and the efficiency of their audits, their tax practices, and their advisory practices. A recent accounting research forum provided examples of advancements achieved via these technologies. For example, around the independent audit, Ding et al. [2] describe a machine learning-based peer selection method. Under this technique, an especially rich comparable group of firms is developed using data clustering techniques. The authors demonstrate enhanced misstatement detection and bankruptcy prediction using the approach. Zhaokai & Moffitt [3] demonstrate how firms are using contract analytics to audit the entire population of client contracts rather than a sample of the contracts.

The authors describe the process and then demonstrate its effectiveness on a group of reinsurance contracts. A final example comes from No et al. The authors demonstrate an enhanced process for using data analytics to identify outliers in huge data populations that allows auditors to focus on items with a high likelihood of misstatement and enhance both the quality and the efficiency of the audit. These are just a few examples of how data analytics are being used to enhance the effectiveness and the efficiency of audits. Such innovations will continue to arise related to audit, tax, advisory, and especially corporate practices. CPAs will certainly need expertise in data analytics in their firms and companies to remain competitive. It is imperative for accountancy programs to provide data analytics training so that CPA firms and companies can get these skill sets from their CPA hires rather than looking to candidates from other degree programs to bring these skills to the firm or company.

Artificial intelligence and the CPA profession

The AICPA defines artificial intelligence (AI) as "the science of teaching programs and machines to complete tasks that normally require human intelligence" AICPA [4]. The difference between AI and RPA or "bots" is: (1) machine learning occurs constantly in the case of AI; and (2) the machine actually makes the decision in the case of AI. As a result, AI is impacting accounting, auditing, tax, and businesses and will do so at increasing rates in upcoming years. CPAs and businesses in upcoming years will identify countless opportunities to innovate using AI and will enhance accuracy, efficiency, and productivity as a result.

AI will also improve the career satisfaction of CPAs and other professionals as it will eliminate the need to carry out complex tasks like contract analysis and transaction vouching and allow the professional to focus on more interesting and value creating work. AI will complete more and more tasks currently carried out by corporate staff. AI will make the audit more efficient and of higher quality and will help tax staff process more returns and do so with more accuracy. For example, Sun [5] provides an example of audits that are being enhanced via an application of AI. The application uses layers of algorithms to draw out correlations in unstructured data and is also used for text understanding, speech recognition, visual recognition, and structured data analysis. The large national and international firms are all investing millions in research and development around AI development. Just one example of the innovations can be seen with KPMG's "Clara" technology. For an introduction to the potential of this technology, readers are encouraged to view the "Youtube" video found at the following URL: https://www.youtube.com/watch?v=uTw1gV5tlKk. We should emphasize that all of the firms have developed such innovations.

Thus, readers are encouraged to conduct additional research to learn about innovations at each of the large CPA firms.

Block chain and the CPA profession

Blockchain refers to the technology that enables and supports distributed ledgers in a peer-to-peer network of participating members. Each member in the network has a copy of the chain of transactions. Transactions are added to the chain after they are validated and executed. As a result, value is exchanged between transacting parties without the assistance of an intermediary such as a bank. Once the transaction is added to the ledger, it cannot be changed. Blockchain networks can be designed for use by a private group of entities or for the public. If the blockchain is private, access is allowed only with permission from a designated individual, business, or group of individuals or businesses within the private group. Thus, private blockchains offer access to a blockchain without relinquishing control or making inside information widely available to users outside of the private group. There is no such privacy with the public blockchain. Public blockchains are open to viewing and use by anyone with access to the internet. The most ubiquitous example of a public blockchain is Bitcoin. However, it should be stressed that blockchain uses are much more diverse than that one particular application - cryptocurrency. Companies such as Walmart, Amazon, JP Morgan, Cargill and many others are already using private blockchains to conduct transactions as part of their ongoing operations and the international CPA firms are "getting rich from the current enterprise blockchain gold rush" del Castillo [6].

Blockchain has the potential to transform business and the accounting for the business. Companies can create immutable and continually updating accounts and financial records that are verifiable and secure. The blockchain could then eliminate the need for most tasks currently performed in the financial reporting process. Please do not read this as our belief that this will eliminate the need for accounting. The truth in our perspective is exactly the opposite. We think the profession will be vastly more interesting and lucrative as these technologies proliferate, but it will be changed. "Smart Contracts" are another feature of blockchains that will transform the way business is transacted. A "Smart Contract" is a computer algorithm that facilitates transactions if the programmed conditions are fulfilled [7].

Similarly, Blockchain could radically change the audit process. In a blockchain, each transaction can be audited as the transaction occurs by multiple independent parties. Essentially, there are not just two parties observing a transaction. Instead, every person and entity with access to the blockchain can observe the transaction. The auditor's role in this environment will evolve to emphasize monitoring the code and the protocols in the blockchain to provide assurance that the information on the distributed ledger is accurate and trustworthy. Blockchain is a fast-emerging technology. Academics are encouraged to familiarize themselves with the blockchain technology and begin to incorporate the concepts into their courses as they develop. Materials are fast emerging to support instruction in these technologies. Students that gain a working understanding or hopefully expertise with the blockchain technology will be especially competitive in the marketplace.

Conclusion

Robotic Process Automation, Data Analytics, Artificial Intelligence (AI), and Blockchain are technologies that have transformed the accounting profession and will do so at increasing rates into the foreseeable future. These technologies will be required to complete the audit, to compete in the market for tax compliance and planning work, to compete in the consulting arena, and to run complex organizations. If accounting students are not gaining these skills, non-CPAs will be required as an integral part of the audit team, the tax compliance and planning teams, and the consulting teams at CPA firms, and the corporate accounting and finance teams at corporations. More importantly, these technologies represent a huge growth area for CPA firms and corporations [8]. It is for these reasons that academic accounting departments must quickly procure the expertise necessary to prepare students for success with these technologies. To this end, we hope that this introduction to the transformational technologies in the profession will be the start of a valuable, enjoyable, and continual learning process.

References

1. Cooper L, Kip Holderness D Jr, Sorensen TL, Wood DA (2019) Robotic process automation in public accounting. Accounting Horizons 33(4): 15-35.

2. Ding K, Xuan P, Wang Y (2019) A machine learning-based peer selection method with financial ratios. Accounting Horizons 33(3): 75-87.

3. Zhaokai, Y, Moffitt K (2019) Contract analytics in auditing. Accounting Horizons 33(3): 111-126.

4. AICPA (2019) A CPA's introduction to AI: From algorithms to deep learning.

5. Sun T (2019) Applying deep learning to audit procedures. Accounting Horizons 33(3): 89-109.

6. del Castillo M (2019) Blockchain goes to work at Walmart, Amazon, JP Morgan, Cargill and 46 other enterprises.

7. Deloittte (2019) The robots are coming. A Deloitte Insight Report.

8. Lee WK, Huang F, Li Q (2019) Multidimensional audit data selection: A framework for using data analytics in the audit Data selection process. Accounting Horizons 33(3): 127-140.

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