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Accounting beyond numbers: information systems and technology embedded in new CPA exam.

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Abstract

The accounting industry is typically depicted as a formal rules-based profession that is numbers oriented and slow to change. While technology and automation continue to take the globe by storm, the accounting industry is sometimes viewed as a profession late to embrace technology. While the profession is historically lags with technology, a recent push with the upcoming CPA Exam highlights how close the accounting profession is to technology and the information systems profession. This study examines the most popular key words utilized in Information Systems research to key words utilized in the Blueprint highlighting areas of emphasis in the CPA exam launching January 2024. The significant degree of overlap suggests that technology and information systems language is essential for all new CPAs.

Keywords: CPA, accounting, information systems, technology

Introduction

Accounting is a dynamic industry that has evolved over the years to maintain relevance with the economy and business operations. The accounting practice formally started in the 15th century with the introduction of double entry accounting by Luca Pacioli, referred to as the Father of Accounting (Sangster and Scataglinibelghitar, 2010). It was several centuries later, specifically in 1896, when the first Certified Public Accountant (CPA) examination was given in the state of New York (Edwards, 1955). Although CPA certification and licensure is not required to be hired as an accountant, the CPA credential is considered the “gold standard” and most popular certification in accounting (Robert Half, 2022). CPA’s often work in public accounting and serve countless businesses as the trusted financial advisor. As of August 24, 2022, there were 665,612 actively licensed CPAs in the United States. (NASBA, August 24, 2022) and 72,271 individuals took at least one section of the CPA exam in 2021 (AICPA, 2021).

In recent years, the CPA exam has experienced a decline in the number of students opting to sit for the exam. While some of this decline has been attributed to the ongoing Covid—19 pandemic that has disrupted school classes along with other educational pursuits since 2020, the number declined prior to Covid. While COVID exacerbated the decline in CPA licensure, the profession has had long standing challenges: such as the high number of work hours, high-stress deadlines, high risks associated with the potential for reporting errors, and lower wages compared to other jobs in finance. Since 2016 the number of unique individuals who sit for at least one exam section has decreased by 29.3% from a peak of 102,291 in 2016 to 72,271 in 2021 (AICPA, 2022).

To be eligible to sit for the CPA exam there are educational requirements defined by each state or other jurisdiction that define specific requirements such as accounting and business coursework and the number of credit hours required to be eligible. For the accounting pipeline into the CPA the number of graduates

from accounting degree programs peaked in the 2015-16 academic year (Gonzalez, 2022). However, 2019-20 witnessed the most significant drop-off in accounting grads with a decrease of 3,391 (Gonzalez, 2022). At the same time, the 2021 Accounting Trends report revealed that in 2020 43% of new hires at accounting firms were non-accounting graduates (U.S. Bureau of Labor Statistics, 2022). Hires of non-accounting graduates into public accounting firms has more than doubled from 2016 to 2021 (AICPA, 2022) with 14.5% of all hires assigned to the Information and Technology Assurance area. Accounting firms are currently in a frantic need of enhanced technology solutions to keep up with the market (Gonzalez, 2022; ICPAS report).

“Additionally, improvements in technology have had a major effect on information systems design, internal control procedures, and auditing methods.” increase in business demands for a variety of highly technical accounting services and greater audit efficiency, the requirements for effective professional practice have increased sharply.
(Gonzalez, 2022)

In looking at the CPA exam over the past 5 years, there was a decline in individuals sitting for the exam even as the number of accounting graduates peaked. Illinois CPA Society CEO, Todd Shipiro, noted “the CPA profession is facing a pace and type of change unlike any it has experienced before—the rules of the race are literally being rewritten by technological, economic, and social change, and we are falling behind” (ILCPAS report). His comments echo the insights shared by annual reports from each “Big 4” Accounting Firm along with a series of other accounting publications that artificial intelligence, robotic automation and other technologies will change the accounting industry (Gonzalez, 2022; ILCPAS report).

The CPA pipeline starts with the degree, then licensure, and employment. The accounting industry, driven by the AICPA notes that “filling” the CPA pipeline is one of the primary strategic initiatives in 2022 (Gonzalez, 2022). The AICPA, state CPA societies, NASBA, accounting firms, and educational institutions realize that enhanced technology acumen is essential to prepare for the ever-changing and technology focused profession.

The AICPA and NASBA received feedback from stakeholders and proposed a significant change to the CPA licensure model, labeled CPA Evolution as the CPA exam and education requirements did not cover all of the knowledge CPAs needed in today’s professional environment (AICPA, 2020). The CPA Evolution model enhances the existing model through adding technology and data analytics as well as one discipline exam in information systems and controls, business analytics and reporting, or tax compliance and planning.

This study analyzes the relationship between accounting and information systems and technology that will assist educators in both accounting and information disciplines identify opportunities for curriculum changes or enhancements. In addition to a literature review the paper presents a summary of technology trends noted in accounting over the past five years that attest to the growing relationship between information systems and accounting. Additional summary tables and diagrams are presented to demonstrate the overlap between the top keywords used in an Issues in Information Systems empirical study (North & Lombardi, 2020).

The North and Lombardi study examines close to 2,100 articles published in the Issues in Information Systems journal between 2000 and 2019. They identified more than 5,300 keywords and terms which were synthesized into large topics over the twenty-year period. Each of the summary tables is cross referenced to the 2024 CPA Evolution exam and the AICPA’s Certified Information Technology Professional (CITP) content. The CITP content is included as it is one the accounting industry’s leading credential in aligning accounting and technology skill sets.

Background

The CPA exam's partnership with the American Institute of Certified Public Accountants (AICPA), state boards of accountancy, and the National Association of State Boards of Accountancy (NASBA) has provided confidence to the accounting profession. The initial CPA exam was given in 1896, and the exam was not uniform across licensing jurisdictions (e.g., United States) until 1917. The uniform exam is centralized with the AICPA responsible for developing the exam content and scoring. NASBA is the national organization coordinating with state boards of accountancy in the US to ensure candidates meet eligibility requirements to sit for the exam. States also have licensing agencies that ensure CPAs maintain their continuing professional education (CPE) requirements. The organizations work well with educators to ensure that candidates are prepared to meet market needs by posting exam blueprints as well as model curricula.

Philosopher Heraclitus noted that the only constant in life is change. Over the years the CPA exam and the accounting profession have undergone several changes. The most significant change over the past couple of decades was the switch to a computerized exam in April of 2004 (Defelice, 2010). In the past decade, the most significant changes to the profession and the exam revolve around technology and some sort of information system. In looking at an overview of the various topics that will be covered on the new exam, more than forty percent is related to technology and systems.

Technology and information systems continues to be a hot topic in the accounting industry. Educators continue to introduce programs that can be utilized to synthesize and process data. In 2005, the Association to Advance Collegiate Schools of Business (AACSB) released Standard A5 which includes the importance of integrating information technology in accounting education (Hoodlebrink et al, 2021). Most schools now offer a data analytics focus with accounting. Additionally, students are now tasked with developing skill sets to manage 'big data'. Scholars are investigating how these technology tools can be integrated into curriculum planning in higher education (Hoodlebrink et al, 2021).

To identify the intersection between the two industries, it is essential to examine their respective underlying structure. The North American Industry Classification System (NAICS) outlines the classification of the nation's twenty broad sectors. Both industries fall under Professional, Scientific, and Technical Services in the US. Computer Systems Design and Related Services fall under NAICS Code 54151. In reviewing the industry report, it is referred to as IT Consulting in the US (Elder, 2020). Accounting Services in the US falls under NAICS Code 54121C (Faber, 2022).

An empirical study in 2020 provides insight regarding the most used terms in the Information Systems (IS) and Information Technology fields between 2000 and 2019 (North & Lombardi, 2020). The study answers: 1) Which keywords have the highest total usage, 2) Which keywords are used most consistently over time and 3) Which keywords experienced the greatest change in usage over time (North & Lombardi, 2020). The article provided an invaluable foundation to compare the language used in the IT/IS fields with Accounting.

The Role of Technology & Information Systems in the CPA Blueprint

The AICPA prepares the CPA Exam Blueprint annually. The Blueprint is a publication that offers a detailed outline of each CPA Exam section's content. The Blueprint has now expanded to encompass the new CPA Evolution, a joint AICPA/NASBA initiative designed to transform the CPA licensure model to "recognize the rapidly changing skills and competencies the practice of accounting requires today and will require in the future."

In 2021, AICPA and NASBA published a revised CPA Evolution Model Curriculum. CPA Exam Blueprint includes Core plus disciplines model set to be implemented for CPA exams beginning January 2024. The

Core emphasizes a strong base with “accounting, auditing, and taxation with a recognition of the impact of technology. The disciplines include 1) tax compliance and planning, 2) business analysis and reporting, and 3) information systems and controls (AICPA, 2022). The revision was prepared with a goal to assist university faculty as they transition accounting curricula to the new core plus disciplines CPA licensure model (Taylor & Dustin, 2021), see Figure 1. It is significant to note that the exam’s core explicitly includes the “recognition of the impact of technology” (AICPA, 2022). Each candidate will be required to take the core exam and one discipline. Additionally, noting the significance of technology, one of the three disciplines is Information Systems and Controls (ISC) (AICPA, 2022).

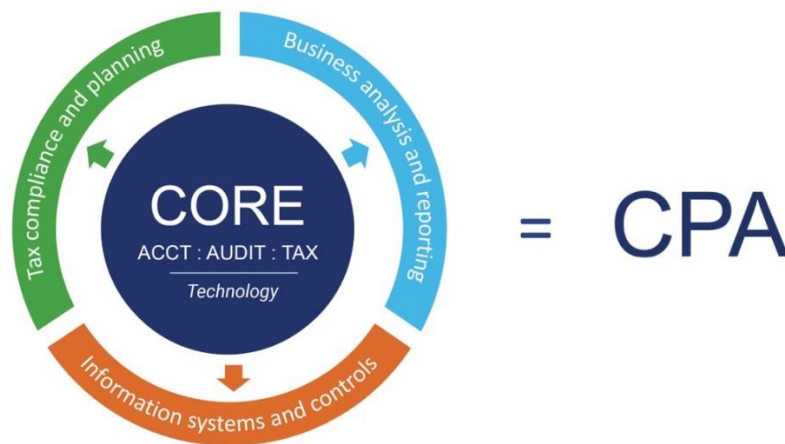


Figure 1: AICPA and NASBA’s CPA Evolution licensure model

Based on the increase in technology/ information systems on the new exam, a popular faculty question centers around what technological applications faculty should teach. However, the AICPA and NASBA do not offer specifics, stating that “technologies are rapidly changing, and the specific technologies used will vary by industry and discipline. However, having a reasonable understanding of prevailing technological trends and applications and how they are impacting services such as audit, tax, and accounting is vital for CPAs. We refer to this type of knowledge of technologies as “digital acumen” in the curriculum resource (Taylor & Dustin, 20021).” This push for CPAs to possess ‘digital acumen’ appears to be consistent with recent hiring trends across the accounting industry and calls for additional technical insight among new hires.

CITP Credential

In January 2014, the AICPA began to offer its members the opportunity to earn the Certified Information Technology Professional (CITP) credential (us.aicpa.org). The credential is awarded to professional accountants that have skills and experience in the following areas: IT assurance, IT risks, data analytics, security and privacy, business solutions, and emerging IT trends. This credential is one of the early efforts

by the AICPA to address the changing needs of the accounting industry regarding Information Systems and technology.

Methodology and Analysis

Overlap between accounting and information systems /technology.

In order to understand the overlap between accounting and information systems/technology, the critical analysis component of this article is a short list of notable technology keywords and hot topics over the past five years (Table 1). Each term has been featured in several AICPA articles and remains a hot webinar topic. I utilize the CPA exam and the CITP context as my proxy for the accounting industry overall. In examining the list, the first keyword is not found in the CPA or the CITP information. While the term ‘big data’ does not appear in the proxies, by definition, it is captured by the term data management, which appears in both proxies. All other terms appear within one, or both of the cross references. The match percentage for the CPA is 67% and 50% for the CITP (Table 1). This attests to the large and growing intersection between accounting and technology.

Table 1 Top Keyword in past 5 years

Number	Keyword	CPA Evolution	CITP
1	Big Data		
2	Data Analytics		X
3	Cloud technologies	X	
4	Cybersecurity	X	X
5	Blockchain	X	
6	Enterprise Risk Management	X	x*
Count	6	4	3
Match Percentage	100%	67%	50%

This critical analysis continues with the use of the North & Lombardi (2020) empirical study that reviews all of the articles published in the Issues in Information Systems journal between 2000 and 2019 (). It offers a baseline to compare keywords highly utilized in the Information Systems, Information Technology space with the coverage in the accounting industry. Again, I utilize the CPA exam and the CITP credential as a proxy for this expanding relationship between the accounting and technology industries. Figure 2 presents a Venn diagrams to illustrate a visual of the intersection between the two industries.

In looking at the articles’ keywords compared to the CPA exam and CITP credentials, there is a 76% match percentage between the most frequently used terms in the Issues in Information Systems journal and the two proxies. It is also significant that the number one term in the North and Lombardi study is the term with the greatest usage, information systems, which is now a discipline option for the updated CPA exam. This attributes to the strong connection between the accounting and information systems/ technology industries.

Table 2 Top 21 Keywords in Issues in Information Systems between 2000 and 2019

Number	Keyword	CPA Evolution	CTIP
1	Information Systems	x	x
2	Information Technology (IT)	x	x
3	E-Commerce		
4	Information Technology	x	x
5	Security	x	x
6	Knowledge Management	x*	x*
7	Privacy	x	x
8	Social Media		
9	E-learning	x*	x*
10	ERP	x	
11	Ethics	x	
12	Internet		
13	Information Security	x	x
14	Project Management	x*	x*
15	Curriculum		x
16	Higher Education	x*	x*
17	Cybersecurity	x	x
18	Online Learning	x*	x*
19	Distance Education	x*	x*
20	Data Mining	x*	x*
21	Business Intelligence		x
Count	21	16	16
Match Percentage	100%	76%	76%

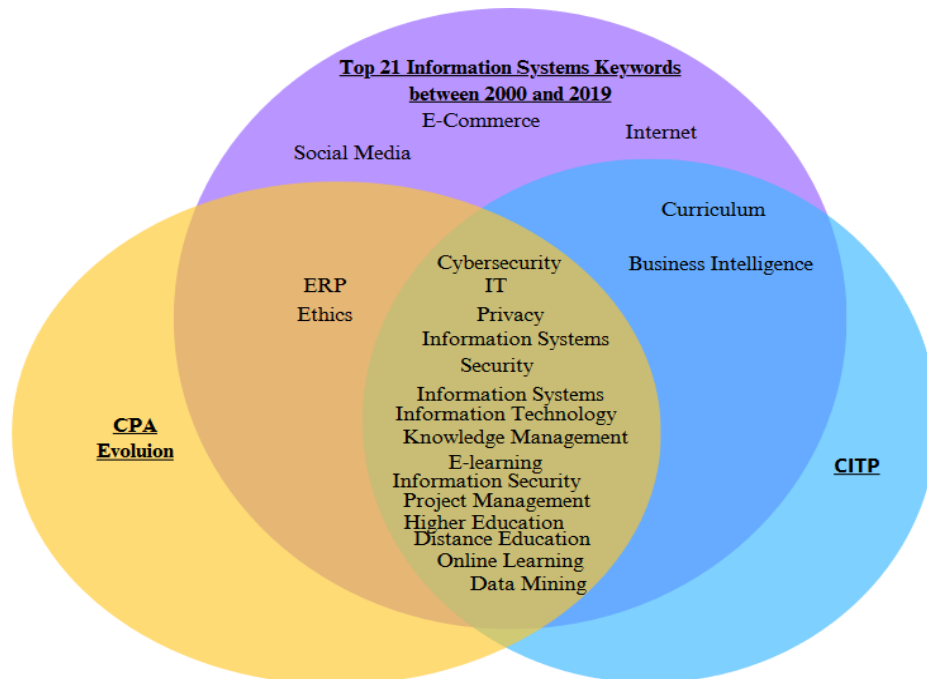


Figure 2: Venn Diagram Intersection of Table 2

Table 3 highlights nine of the keywords with the highest delta over the two decades. It is interesting to note the number of different terms that come up surrounding education topics. Different terms are utilized but ultimately express the same theme. The match percentage with the CPA proxy is 78% and the CITP proxy is 67%. Again, this notes the significant connection between the two industries. Additionally, it is notable that even as some terminology has changed a bit over the years, links can still be found in key accounting settings.

Table 3 Keywords with Highest Change over 20 years

Number	Keyword	CPA Evolution	CITP
1	Ethics	x	
2	Privacy	x	x
3	Online education	x*	x*
4	Distance education		
5	Online learning	x*	x*
6	Information Security	x	x
7	Assessment	x	x
8	E-government	x*	x*
9	Pedagogy		
Count	9	7	6
Match Percentage	100%	78%	67%

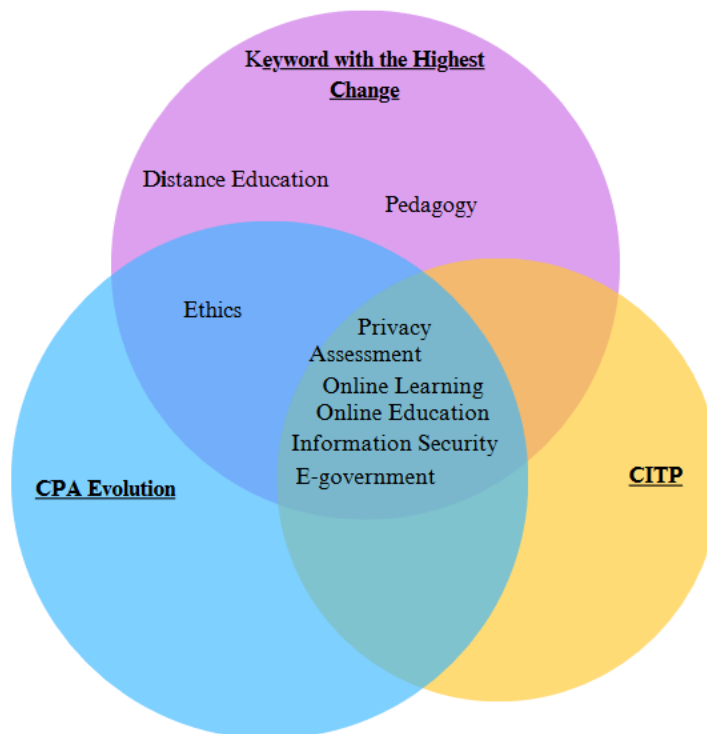


Figure 3: Venn Diagram Intersection of Table 3

Conclusion

In summary, this paper has examined the intersection between information systems and accounting. I find there is currently a significant overlap between information systems and accounting. In briefly looking at the most popular terminology the match is greater than fifty percent across both categories. It seems that the expanding relationship between accounting and technology continues to evolve in alignment with market demands. There are several aspects of the information systems arena that appear within the accounting industry. Education, firms and society continue to call for accounting professionals who have increased technology acumen of accounting professionals. In examining the organized exams, it is easy to see the overlap between the two. The CPA exam has specific educational requirements to sit for the exam, and accounting programs must align curriculum to those requirements. There are opportunities for faculty in information systems disciplines to offer coursework, teaching, or assistance as accounting programs revise curriculum to align with the new requirements of the accounting industry and CPA exam.

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