

RESEARCH ON ACCOUNTING PROFESSIONALS IN THE DIGITAL ECONOMY ERA

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ABSTRACT

This study aims to explore the competencies that accounting professionals need to have in the digital economy era. Based on the competency theory, the iceberg model and the onion model theories, the competency model of accounting professional talents in the digital economy era is refined. A total of 414 questionnaires were completed with company managers from different industries in Guangxi Province, China, and the data were analyzed by descriptive statistics. The results of the study show that accounting professionals in the current era of the digital economy need to have technical and enabling capabilities and summarize 11 competency elements, of which the technical capabilities mainly include digital technology, big data and data analytics, robotics and artificial intelligence, cybersecurity, tax implications, as well as legal and regulatory requirements, and skills, and the enabling capabilities mainly include: professional and ethical behaviors, problem-solving and decision making, communication, self-management, teamwork and leadership. This study concludes that accounting talents with digital competence can more effectively improve the efficiency of enterprises, will provide a basis for enterprises to screen accounting talents, and will also be conducive to the accounting practitioners to understand the needs of enterprises to improve themselves in a targeted manner.

Keywords: Digital Economy, Competency, Accounting Talent

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INTRODUCTION

In recent years, information technology has been constantly updated and developed in the era of the digital economy, technological innovations and digital transformation are profoundly changing the business environment and how organizations operate (Briggs et al., 2018). Awayiga, Onumah and Tsamenyi (2010) suggested that accounting talents, critical supporters of business operations and decision-making, face unprecedented challenges and opportunities. (Bolt-Lee & Foster, 2003) argued that current accounting professionals are no longer just tedious data recording and report preparation but have become key players in strategic decision-making and need broader and deeper competencies to adapt to this evolving environment. In order to adapt to the needs of social and economic development, the application environment of accounting work has changed a lot. This change will inevitably put forward higher requirements for the current accounting talents, and the competence of accounting talents is also facing new challenges. According to the National Informatization Development Strategy 2006-2020, the Ministry of Finance issued the Guidance Opinions on Comprehensively Promoting China's Accounting Informatization Work. The document pointed out that "Promoting the construction of accounting talents is one of the main tasks for comprehensively promoting China's accounting work, and it is necessary to improve the competence framework of accounting personnel, emphasize the content of technical aspects and skills, strengthen the cultivation of accounting talents, and focus on building a composite accounting talent team. (Daff & Jackling, 2012)

This paper aims to examine the competencies of accounting professionals in the digital economy, i.e., the knowledge, skills, abilities, and literacy required of accountants in the context of digital transformation. (Hihiro, Yuji, & Pekka, 2018) Suggests that the rise of the digital economy has brought new tasks and responsibilities to the accounting field, requiring accounting professionals to possess in-depth knowledge and mastery of digital tools, data analysis, and information security. However, accounting competency in the digital economy is not only about technology but also about adaptation to change, the development of innovative thinking, and the ability to work in cross-functional teams. (Ren, DU, & Pei, 2017) In summary, with the development of the times, the ability demand of enterprises for accounting talents has changed dramatically (CGMA, 2014), and the original accounting talent competency no longer adapts to the development needs of enterprises. Through the in-depth analysis of the competency of accounting professionals in the era of the digital economy, we can better understand the competencies that accounting talents need to have in the context of digital transformation, provide guidance and inspiration for them to succeed in the face of increasingly complex and diverse business environments, and also provide a basis for enterprises to screen accounting talents, which is also conducive to the understanding of the needs of enterprises for accounting practitioners to target and improve themselves. It will also help accounting professionals understand the needs of enterprises and thus improve themselves in a targeted manner.

LITERATURE REVIEWS

Competency related study

Pro. McClelland (1973) proposed "competence", he believes that specific knowledge, skills, abilities, motivation and traits have a significant impact on the outstanding performance of high performers, and the combination of these elements is "competence." Pro. Boyatzia (1982) believes that competence is an intrinsic characteristic that creates outstanding performance, and these characteristics mainly include: knowledge, skills, motivation, social roles, personality traits, self-image, attitudes and values. The American Institute of Certified Public Accountants (AICPA, 2006) proposes six essential competencies in the guidelines related to the accounting competency framework. The competencies of an accountant are the ability to work in a

comprehensive manner, management skills, learning skills, communication skills, leadership skills, and professional skills. The International Federation of Accountants (IFAC, 2001) issued a "White Paper" that the professional competencies of professional accountants should be defined as technical knowledge, behavioral skills, attitudes, professional values and ethics. The Institute of Chartered Accountants in the United Kingdom (ICAEW, 1991), in the course of developing a professional development manual, suggested that the core elements of competence for accountants include four main areas, namely, working more effectively as an individual, professional skills, leadership and business management.

Based on the above scholars' proposals on the competencies that accountants need to possess today, and in conjunction with the World Bank's Center for Financial Reporting Reform (CFRR) (Borgonovo, Friedrich, & Wells, 2019), which suggests the importance of accountants' ability to gain competencies from the potential of sustainable financial reporting, and to develop education and training management for accountants in the digital and globalized economy Guidelines, the competencies that accountants need to possess in the context of the digital economy can be summarized as 1) technical competencies; and 2) enabling competencies. Among them, technical competencies mainly include 1) digital technologies, 2) big data and data analytics, 3) robotics and artificial intelligence, 4) cybersecurity, 5) tax implications, and 6) legal and regulatory requirements; and enabling competencies mainly include 1) professional and ethical behaviors, 2) problem-solving and decision making, 3) communication, 4) self-management, and 5) teamwork and leadership; The research on accounting competency is still in the primary stage in China, this paper takes accounting professionals as the research object, researches the competency that accounting personnel need to have, constructs the framework of professional competency for accounting professionals, and investigates the research supply and demand status quo of accounting talents in the era of China's digital economy, to make the competency framework more suitable for China's national conditions, which is precisely where the innovation of this paper lies.

Related research on the technical ability of accounting personnel

Almost all businesses use the Internet to conduct financial, tax filing or statistical reporting transactions with their customers. Among other things, accountants must take significant responsibility for these activities (Georgieva, 2019). Accountants still need knowledge or technical skills and soft skills such as digital competence (Gullo, 2019; Moll & Yigitbasioglu, 2019; Kokina et al., 2019).Gullo (2019) explains that they have to have the knowledge and skills including 1) digital technology, 2) big data and data analytics, 3) Robotics and Artificial Intelligence, 4) Cybersecurity, 5) Tax Implications, and 6) Legal and Regulatory Requirements, which are a combination of interdisciplinary with a variety of skills and competencies. (Aguirre, 2015) In the digital economy, accounting professionals must have competencies that go beyond traditional technical accounting skills and adapt to rapidly changing business environments and technological developments with broader and deeper competencies and literacies. (Carretero & Vuorikari, Punie, 2017) The following are the technical competencies that accounting professionals need to possess in the digital economy environment:

Digital Technology: Accounting professionals need to master digital tools and technologies, including financial software, data analysis tools, cloud computing, etc., in order to process financial data more efficiently, generate reports, and perform data mining and analysis to provide better information to help organizations plan and budget, facilitate day-to-day operations, and improve efficiency and customer satisfaction, have the ability to analyze data, explore the potential of data, make full use of data to make predictions, decisions, and improve management decisions.

Big Data and Data Analysis: In the era of the digital economy, a large amount of data is generated and stored, and accountants need to have the ability to analyze data, be able to extract valuable information from large amounts of data and be able to clearly explain the meaning of

the data, quickly extract adequate information and manage it efficiently to provide decision support and risk avoidance for the organization effectively.

Robotics and Artificial Intelligence: Accounting professionals need to be skilled in the use of Artificial Intelligence, which can reduce data errors, enable accurate analysis, improve accounting efficiency, provide better and more accurate data support for decision-making, provide more in-depth data analysis, provide new insights into accounting operations, categorize and organize accounting data, and vouchers can be automatically categorized, vouchers can be prepared, and financial statements can be issued.

Network Security: Optimize the network environment for accounting system operation, enhance the ability of network system security and confidentiality, be able to repair network vulnerabilities, ensure enterprise control and accounting data privacy-related security, strengthen the internal network management supervision of accounting and standardize the operation of financial software and other work.

Tax Impact: Familiar with the processes and regulations of various aspects of taxation, able to accurately account for tax obligations, develop reasonable tax programs to ensure that the enterprise achieves legal compliance tax, with a certain degree of legal literacy, able to do a good job in tax declaration, tax processing, tax planning, accurate tax-related affairs, master the relevant policies and regulations of tax planning and the actual situation of the enterprise, develop reasonable tax planning programs.

Legal and Regulatory Requirements: Understand the basic legal and compliance knowledge, ensure that the accounting work is in line with the relevant regulations and rules, maintain the truthfulness and accuracy of the enterprise's financial information, and regulate the standardized business behavior of the enterprise. Familiar with national laws, regulations and the national unified accounting system, always adhering to the requirements of laws, regulations and the national unified accounting system for accounting and implementing accounting supervision.

In conclusion, in the digital economy environment, accounting professionals need to have a more comprehensive and diverse set of competencies that are not limited to traditional accounting techniques but also the ability to adapt to change, think creatively, and work in a team to better support the growth and success of the organization (Ningsih, 2014).

Related research on the auxiliary ability of accounting personnel

The World Bank's Center for Financial Reporting Reform (CFRR) (Borgonovo et al., 2019) foresees the importance of accountants' ability to derive competencies from the potential of sustainable financial reporting. It develops guidelines for managing education and training accountants in the digital and globalized economy, which can be categorized as enabling competencies. Enabling competencies include 1) professional and ethical behavior, 2) problem-solving and decision-making, 3) communication, 4) self-management 5) teamwork and leadership. (Daigle, Hayes, & Hughes, 2007) Accounting-enabling competencies are those in which accounting professionals make full use of their professional knowledge and skills in their work to support decision-making, operations, and management of the organization, thereby enhancing the organization's business effectiveness and strategic decision-making capabilities (Liu, 2021). Accounting enabling capabilities emphasize the role of accounting in achieving organizational goals and missions beyond traditional financial data processing and reporting to include a deeper understanding and support of business and strategy. The following are specific elements of the enabling competencies that accounting professionals need to possess in the digital economy environment:

Professional and Ethical Behavior: In the digital economy, accountants must follow more laws, regulations and ethical guidelines to ensure the accuracy and compliance of financial reporting, be familiar with accounting operations, be proficient in professional knowledge and master technical accounting methods.

Problem-Solving and Decision-Making: Being able to analyze financial problems, validate problematic data and prevent similar problems from recurring, selecting and evaluating financial solutions as well as policies through one's professional competence and business skills, effectively assessing an organization's financial position and risks, and proposing new financial solutions and recommendations.

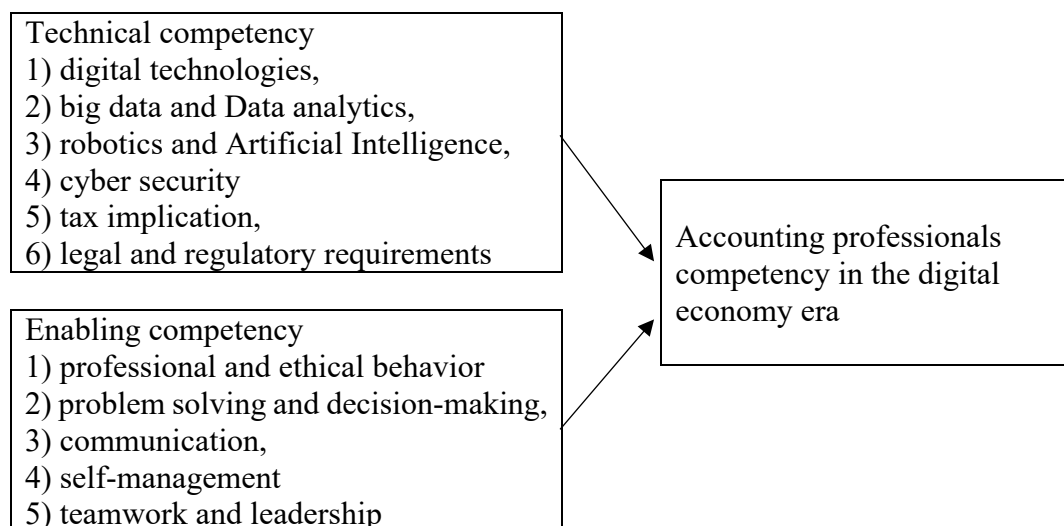
Communication: Accounting professionals need good communication skills to communicate complex financial information clearly and straightforwardly to non-professionals, as well as to have the ability to influence others and facilitate decision-making and implementation.

Self-Management: Effective planning and management of work time, prioritizing tasks to ensure that work is completed on time, ability to adhere to a strict code of ethics, follow guidelines, and not disclose trade secrets, ability to work with large amounts of data and information and organize time efficiently to ensure that work is completed on time.

Teamwork and Leadership: Accounting is closely related to other departments in the digital economy. Accounting professionals need to be able to work in cross-functional teams and collaborate with marketing, technology, operations and other departments to achieve comprehensive business support. Accounting professionals can coordinate the resolution of financial issues, take a leadership role in the team and mentor other members.

Accounting enabling competencies go beyond the core responsibilities of accounting professionals and encompass an in depth understanding of the business and the organization to provide decision makers with more comprehensive financial and operational information for the continued growth and success of the organization. These competencies often require continuous learning and practice to adapt to changing business environments and organizational needs.

Based on the above literature review, a conceptual framework can be derived as shown in Figure 1



RESEARCH METHODOLOGY

In order to study the competency of accounting talents in the era of the digital economy, descriptive statistics were used in this study. In this paper, 11,765 enterprises in the agricultural and food industry, consumer products industry, real estate and construction industry, industrial industry, financial industry, service industry, and technology industry in Guangxi province were surveyed. The population sample was calculated according to the formula proposed by Yamane (1967), and questionnaires were administered to more than 400 CEOs, CFOs, accounting managers, and human resource managers in the enterprises. The questionnaire was divided into four parts; the first part included demographic data such as gender, age, and

education level. The second part of the questionnaire includes company profile statistics such as company industry, company size, company nature, and company years of existence. The third part of the questionnaire used a Likert scale of 1-5 from 1 for "strongly disagree" to 5 for "strongly agree" to examine the digital technology (DT), big data and data analysis (BD), robotics and artificial intelligence (RA), and other accounting capabilities included in the accounting technology competency and accounting enablement competency, respectively. Artificial intelligence (RA), Network Security (NS), Tax Effects (TE), Laws and Regulations require (LE), Professional and Ethical behavior (PE), Solve problems and Make decisions (SM), Communion (CO), Self-Management (SM), Team spirit and leadership (TI) and other 11 dimensions.

Before applying the instrument for data collection, the questionnaire was systematically tested for item-objective congruence (IOC) and Cronbach's alpha reliability. The findings showed that the IOC was equal to 0.89 and Cronbach's alpha was 0.884, indicating that the quality of the research instrument was sufficiently high (Polit & Beck, 2006; Hair et al.) In order to obtain the data, the study sent questionnaires to the CEOs, CFOs, accounting managers, and human resource managers of the enterprises of the different companies in Guangxi Province. For data analysis, descriptive statistics including frequency, percentage, mean, and standard deviation were used and the results were reported in descriptive and tabular forms.

RESEARCH RESULTS

Respondents' Profiles and Studied Variables

Most of the respondents were female (230 or 55.56%) compared to male (184 or 44.44%). Concerning the age of the respondents, the results show that the majority of the employees were in the age group of 20-30 years (111 or 26.81%), followed by the age group of 30-40 years (184 or 44.44%) and 40-50 years (65 or 15.7%), and over 50 years (54 or 13.04%). Regarding educational attainment, the highest level of education was a bachelor's degree (260 people, or 62.8%). Meanwhile, 34 employees (8.21%) and 101 employees (24.40%) received a master's degree and less than a bachelor's degree, respectively. In addition, the findings show that 19 employees (4.59.0%) have a doctoral degree. In terms of the respondents' job positions, there are (108 or 26.09%) who are CEOs of the company, (137 or 33.09%) who are Human Resource Manager of the company, (96 or 23.19%) who are Chief Finance Officer of the company, and (73 or 24.40%) who are Accounting Manager (73 persons, 17.63%).

In addition, the distribution of the profile characteristics of the companies in the sample of this study is relatively balanced, in terms of the distribution of the industries to which the companies belong, the agriculture and food industry (63, 15.22%), consumer goods industry (52, 12.56%), real estate and construction industry (48, 11.59%), industrial industry (51, 12.32%), the financial industry (60, 14.49%), Energy (28, 6.76%), Services (61, 14.73%), and Technology (51, 12.32%). In terms of company size distribution, companies with 1-50 employees accounted for 24.88%, companies with 51-100 employees accounted for 33.09%, companies with 100-200 employees accounted for 22.95%, and companies with more than 200 employees accounted for 19.08%. Regarding the distribution of the company's nature, state-owned enterprises accounted for 23.67%, private enterprises accounted for 39.37%, Sino-foreign joint ventures accounted for 20.05%, and social organizations accounted for 16.91%. In terms of the number of years the company has been established, 24.88% have been established for 1-5 years, 31.4% for 6-10 years, 21.01% for 11-15 years, and 22.71% for more than 15 years.

Table 1 Summary of the average and level of all factors

Variables	Mean	SD	Level
Digital Technique (DT)	3.27	1.03	Moderate
Big data and Data analysis (BD)	3.27	0.92	Moderate
Robotics and Artificial intelligence (RA)	3.28	0.95	Moderate
Network Security (NS)	3.27	0.94	Moderate
Tax Effects (TE)	3.26	0.97	Moderate
Laws and Regulations require (LE)	3.28	0.96	Moderate
Professional and Ethical behavior (PE)	3.32	0.98	Moderate
Solve problems and Make decisions (SM)	3.30	0.95	Moderate
Communion (CO)	3.33	0.93	Moderate
Self-Management (SM)	3.36	0.95	Moderate
Team spirit and leadership (TI)	3.32	0.94	Moderate

Table 1 summarizes the statistical results of the means and standard deviations of all the factors. The study found that the majority of respondents identified self-management (SM) as the most critical competency for accounting professionals to possess in the digital economy with a mean of 3.36; followed by communication skills with a mean of 3.33; professional ethical behavior (PE) and teamwork and leadership (TI) with a mean of 3.32; problem solving and decision making (SM) with a mean of 3.30; robotics and Artificial Intelligence (RA) and Legal and Regulatory Requirements (LE) have a mean of 3.28; Digital Technology (DT), Big Data and Data Analytics (BD) and Cybersecurity (NS) all have a mean of 3.27; and Tax Implications (TE) has a mean of 3.26, and they are all at a moderate level.

DISCUSSION & CONCLUSION

This study uses a web-based questionnaire to explore what technical and enabling competencies accounting professionals need to have in the digital economy era. Based on the competency theory the iceberg model and the onion model as theories, the competency model for accounting professionals in the digital economy era is refined. The rise of the digital economy has brought new research tasks to the accounting field.(Cory & Pruske, 2011) Verified the scientific validity of the competency model from the point of view of accounting professional talents, expanded the current application of the competency model in human resources, and enriched the connotation of the model. This study concludes the following: Accounting talents in the digital era need to possess the following 11 elements of competency (Gullo, 2019; Moll & Yigitbasioglu, 2019; Kokina et al., 2019), of which technical competencies mainly include: digital technology, big data and data analytics, robotics and artificial intelligence, cybersecurity, tax implications, and skills such as legal and regulatory requirements, and enabling competencies mainly include: professional and ethical behavior, problem-solving and decision making, communication, self-management, teamwork and leadership. The results of the study show that accounting talents with digital competence can more effectively improve the efficiency of enterprises, will provide a basis for enterprises to select accounting talents, and will also be conducive to the accounting practitioners to understand the needs of enterprises to improve themselves in a targeted manner.

The results of the study show that in the current process of accounting personnel development, accountants with technical skills such as digital technologies, big data and data analytics, robotics and artificial intelligence, cybersecurity, tax implications, and legal and regulatory requirements (Husnutdinov, Stepanova, & Meshkova, 2020) can be more efficient in processing financial data, generating reports and perform data mining and analysis to provide better information to help organizations plan and budget, facilitate day-to-day operations and improve efficiency and customer satisfaction, make full use of data for forecasting, decision

making, and improve management decisions; quickly extract adequate information and manage it effectively, effectively provide decision support and risk avoidance for the organization, which can reduce data errors, enable accurate analysis, improve accounting efficiency, and provide better support for decision-making. Provide better and more accurate data support, provide more in-depth data analysis, provide new insights into accounting operations. The results of this study are consistent with the findings of Stancheva-Todorova (2019). In this technical competence content scale, the average Likert scale scores were all above 3.28, indicating that in the digital economy environment, accounting professionals need to have more comprehensive and diversified competencies, not only limited to traditional accounting techniques but also the ability to adapt to change, innovative thinking, teamwork to support the development of business organizations better.

The results of the study show that the discussion in this study is also consistent with the study by (Borgonovo et al., 2019) that accounting professionals in the digital economy need to have enabling competencies such as professional and ethical behavior, problem-solving and decision-making, communication, self-management, teamwork, and leadership, and being able to analyze financial problems, validate problematic data, and avoid similar problems from reoccurrence, select and evaluate financial solutions as well as policies through their professional competence and business skills, effectively assess the financial position and risks of the organization and propose new financial solutions and recommendations, ensure the accuracy and compliance of financial reporting, familiarity with the business, proficiency in specialized knowledge, and mastery of technical accounting methods. (Dakhli & El-Zohairy, 2013) Effectively planning and managing work time, prioritizing tasks to ensure that work is completed on time, being able to follow a strict code of ethics, adhering to guidelines and not disclosing trade secrets, being able to deal with a large amount of data and information and organizing time efficiently to ensure that work is completed on time. In this enabling competency content scale, the average Likert scale scores were all above 3.3, indicating that in the digital economy, accounting professionals need to have the ability to provide decision-makers with more comprehensive financial and business information for the continued growth and success of their organizations. These competencies often require continuous learning and practice to adapt to the changing business environment and organizational needs.

The findings of this study can provide two crucial contributions: theory and practice. (Cook, Jones, Raghavan, & Saif, 2018) Compared with traditional accountant competencies, accounting professionals in the digital economy era are more adaptable to social and economic development needs. In terms of theoretical contributions, this study combined the relevant literature with competency theory to construct a relational model of competency of accounting professionals in the digital economy era to clarify what professional competencies should be possessed as necessary talents to promote the development of the accounting industry. This study combines the relevant research on the competence of accounting talents by many scholars at home and abroad and finds that (Palmer et al., 2004). However, more scholars have analyzed the competence of the current accounting talents, very few scholars have taken into account the role played by the accounting professional talents in the context of the digital economy. This study proposes talent competence talent development for the accounting industry as a theoretical basis, which provides new ideas for enterprises to screen accounting talents.

The actual contribution is threefold: First, for the market economy, accountants play an essential role in the market economy, and the competency framework for accountants is conducive to meeting the increasing demand for accountants' competency in the digital economy and helping accountants to play an active role in promoting the social economy. Secondly, for the accounting profession, the competency framework for accountants can provide measurement standards for the selection and cultivation of talents in the profession and continuously input qualified talents for the profession's continuous development, thus helping

the profession to develop in a healthy and orderly sustainable manner. Thirdly, for practitioners or students of accounting and related industries, the competency framework for accountants can provide a reference basis for personal career development and planning and help accountants carry out self-evaluation, self-management and self-development.

1) The social informationization environment is constantly changing, and accounting informatization is also constantly developing. The professional competence of accounting talents must adapt to these changing external environments to serve the enterprise management better and better adapt to social needs.

2) In the research process of this paper, the selected samples and questionnaires are mainly concentrated in the Guangxi region. The number of questionnaires issued in other cities in China only accounts for a tiny part of the overall number. The total number of questionnaires issued needs to be bigger compared with large-scale foreign studies, which reduces the representativeness of the data. In future research, it is hoped that a large-capacity random sample can be taken nationwide to make the study more representative, which will help the study obtain more in-depth and richer research results.

3) In terms of research methodology, this study mainly adopts the questionnaire survey method. In the future, in-depth interviews can be added to explore in-depth research on the competency of accounting professionals in the digital economy era to enhance the study's innovation and make it more meaningful.

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