

# The Effects of Cloud Computing and Cybersecurity Skills on Accountants' Employability in the Digital Era: Towards Research Agenda

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## ABSTRACT

Today, cloud computing has become an important part of accounting work. It helps firms with cost saving and easy access to financial data anywhere and anytime. However, the excessive reliance on digital systems can also become a more significant risk of cyberattacks. As such, high-quality cybersecurity securing financial data has become one of the priorities. It is a technological transformation that directly affects the employability and lack of skills requirements among accountants. To stay relevant the accountants are also required to acquire knowledge on accounting and technology, particularly, the cloud computing and cybersecurity. Accountants would thus need these skills to stay competitive in this digital dynamic world. The article under discussion is related to the impact of cloud computing and cybersecurity competencies on the employability of accountants in the digital age.

**Keywords:** Employability, cloud computing, cybersecurity, accounting profession

## INTRODUCTION

Employability means how well a person's skills match what employers are looking for when they decide who to hire (Ghani et al., 2024; Hillage & Pollard, 1998). The capacity of an accountant to comprehend and apply new technologies, including cloud computing and cybersecurity, is a key factor in the digital age to be considered in regard to the employability of the individual. The nature of cloud computing has transformed financial data storage, access, and sharing and therefore accountants need to take care of these tools in a secure and effective way. Simultaneously, as cybersecurity threats rise, they will help to ensure the security of financial information as well as comply with data protection rules. With the ability to utilize and employ the cloud and cybersecurity solutions, accountants have an improved opportunity to live up to the expectations of the employers and remain in the job market in the present-day world of technologies (Derks, 2024; Coman et al., 2022; Zhang et al., 2020; Ernst and Young Singapore et al., 2022).

In the case of accountants, it is possible to see how employability in the digital era is becoming more determined by their capacity to comprehend and implement new technologies in the digital space, including cloud computing and cybersecurity. The rapid integration of cloud-based accounting systems has transformed the way in which financial information is stored, accessed and shared and accountants are expected to deal with cloud platforms in a secure and efficient manner. Meanwhile, the risks associated with cyber security are growing and this has resulted in more expectation of accountants to safeguard sensitive financial data and maintain its accordance with requirements associated with data protection. Consequently, accountants with technical knowledge and practical skills to make use of cloud computing and cybersecurity services have a better chance of meeting the expectations of their employers and staying employable in the technology-driven environment (Coman et al., 2022; Derks, 2024; Zhang et al., 2020; Ernst and Young Singapore et al., 2022).

Therefore, the research questions for this study are developed as follows (1) What is the perceived effect of cloud computing skills on the perceived accountants' internal employability? (2) What is the perceived effect of cloud computing skills on the perceived accountants' external employability? (3) What is the perceived effect of cybersecurity skills on the perceived accountants' internal employability? (4) What is the perceived effect of cybersecurity skills on the perceived accountants' external employability?

## LITERATURE REVIEW

### Cloud Computing Skills

Cloud computing refers to a model of service that offers the convenient and on-demand and real-time network access to a configurable and shared pool of resources such as servers, storage, applications and networks (Awotomilusi et al., 2022). It is commonly known as cloud accounting or online accounting in the accounting industry that uses remote servers to store, process, and update financial data, thus removing the maintenance of hardware and software locally (Jayalakshmi.M et al., 2023). Accounting practices can be significantly enhanced by the utilization of cloud platforms in terms of their efficacy and efficiency (Awotomilusi et al., 2022). In addition, cloud systems allow real time updating of information and financial reporting, they are able to be scaled to suit the changing demands, and the data is available 24/7 and anywhere if there is internet connection (Ehioghiren & Ojeaga, 2022). Moreover, cloud platforms can increase the efficiency of operations through automation of its routine operations (payroll, invoicing, and tracking expenses), as well as by making it accessible and available to teams across the globe and allow authorized global users to collaborate (Ehioghiren & Ojeaga, 2022).

This radical technological change has significant implications on the employability of accountants and the professional skills demanded (Ernst & Young Singapore et al., 2022). With the resourcing of repetitive and routine functions to cloud technologies and smart automation (such as data entry and calculations), the practitioners are forced to shift to complex and advisory forms of services, which entail information analysis, risks management, and insights. In order to be competitive and relevant in such a future-ready environment, an interdisciplinary skillset, comprising of technical competence and the traditional financial knowledge, should be acquired by accountants. The major competencies include not only the required knowledge (understanding) of Cloud Computing Application but also the ability to apply this knowledge to the high-level tasks. The accountants should be able to handle the deliverables of technology and manage automation tools. This hybrid knowledge requirement is leading to a shift in the nature of professional roles, with continuous education and training being necessary to both current and future professionals. The change of roles reflects the increasingly interdisciplinary nature of modern accounting, which has resulted in an increased number of jobs that specifically involve the use of cloud knowledge, including IT Auditors, who need to have the ability to analyze IT systems and avoid it cases of IT-related business risks (Ernst & Young Singapore et al., 2022).

### Cybersecurity Skills

The concept of cybersecurity refers to the act of protecting systems, networks, and programs against cyber-attacks (Hasan et al., 2024). It encompasses resources, processes, and structures employed to safeguard cyberspace and systems that rely on cyberspace with particular attention to safeguard networks, computers, programs and data to achieve confidentiality, integrity and availability (Craig et al., 2014). Cybersecurity is essential in accounting profession. There are numerous threats to the accounting system due to the use of the digital environment, including phishing, ransomware, data leakage, and insider threats (Hasan et al., 2024). Financial information is very sensitive, and it includes individual and company finances, financial reports and trade secrets in a business. Therefore, the consequences of unauthorized access or breaches may be very severe such as loss of money, reputation and legal liability. The compliance, risk management, and maintenance of trust and integrity in financial reporting require the inclusion of cybersecurity. The general codes, e.g., the General Data Protection Regulation (GDPR) and the Sarbanes-Oxley Act (SOX) enforce strict cybersecurity practices, and failure to adhere to them could result in serious fines. Thus, companies have incorporated advanced security standards, constant surveillance, and cutting-edge technologies to ensure data integrity and minimize risks (Hasan et al., 2024).

The need for cybersecurity fundamentally changes the roles and needed skillsets of accounting professionals and directly affects their employability (Hasan et al., 2024). The use of strong security measures has greatly altered working accounting making data harder to tamper with and easier to detect fraud. Today, identifying potential risks and actively working to prevent security threats are part of the job for accountants. To keep up with these changes, accountants need to build up a balanced skill set that has strong accounting knowledge and the ability to understand and use modern technology and cybersecurity (Ernst & Young Singapore et al., 2022). The

required cybersecurity skills are both knowledge (understanding) and application (ability to use): (1) Understanding: Accountants need to have a full understanding of cybersecurity principles and application (MIA, 2021; Nilsen et al., 2017). This includes awareness of threat identification, security protocols, and compliance requirements; (2) Application: This includes the ability to deploy and to manage defensive measures such as implementing sophisticated encryption methods, able to identify different types of cyber-attacks, being able to operate antivirus software as well as implementing strong password practices (MIA, 2021; Nilsen et al., 2017).

### **Internal and External Employability**

Based on the Rothwell article, self-perceived employability concerns the extent to which people believe they possess the skills and other attributes required to find and stay in work of the kind they want. Conceptual literature often talks about the difference between internal and external employability in relation to different labour market dynamics. Internal employability is the individual's capacity to achieve at least a desirable or preferred position or advancement in their current organization while external employability is the capacity of the individual to be able to gain employment opportunity outside of the current workplace. Both of which are crucial for the career growth and professional sustenance of the accountants (Rothwell & Arnold, 2007).

Thus, in this research, both internal and external employability are taken into consideration as important dimensions of perceived career potential of accountants in this internet age. Internal employability is about the individual's perception of his or her chances of getting desirable roles or career advancement within his or her current organisation based on his or her perceived value and contribution to the firm. External employability, on the other hand, has to do with their perceived ability to find employment outside of their current organisation and is their competitiveness and attractiveness in the wider labour market (Rothwell & Arnold, 2007). In light of a rapidly evolving world with the advent of not only advanced technological developments but also digital transformations, both dimensions are being increasingly influenced by the knowledge and skills of the accountants in understanding and applying the digital technologies and hence are key indicators of the professional sustainability and relevance in the current notified accounting profession.

### **Building Accountants' Employability in the Digital Era**

Employability is the ability and willingness to evolve with the organisational changes of an individual and maintain his relevance and utility in his current job. With the current world of technology, accountants that are open to such changes and learn the relevant technologies will be in a better position to work efficiently in their respective organisations thus enhancing their employability.

Employers are demanding accountants who can not only use technology to streamline routine duties and create valuable financial information but also protect sensitive information against cyber-crimes. With cloud computing, accountants can provide more efficient services to their clients because they can access financial information in real time, enhance collaboration, and make decisions at any place. Such availability and flexibility boost productivity and responsiveness of work done by accountants, therefore accountants who have good skills on cloud computing become very valuable in their organisations. Meanwhile, cybersecurity competency is becoming essential since accountants are frequently inheritors of confidential financial data. The knowledge and implementation of cybersecurity principles can assist them in reducing areas of vulnerability, data breaches, and regulatory adherence. By demonstrating these capabilities, accountants can enhance not only their internal employability, reflected in their role in ensuring stable and effective operations, but also their external employability because these skills are sought in the range of industries that are moving to meet the digital transformation. Combined with the knowledge of the cloud computing and the cybersecurity, the traditional accounting knowledge in the digitalisation era still contributes greatly to the professional relevance and career opportunities of accountants (Ernst & Young Singapore et al., 2022).

### **Practical Applications of Cloud Computing and Cybersecurity in the Big Four Accounting Firms**

The Big Four accounting companies (Deloitte, EY, KPMG, and PwC) are aggressively using cloud computing to increase operational performance, data storage and teamwork (Ernst & Young Singapore et al., 2022). This enables the auditors and consultants to remotely access the information of their clients via the network, automation of workflows, and minimization of manual errors. In addition, cloud-based applications allow these

companies to handle a significant amount of financial data safely and in real-time (Phu et al., 2025). In addition, cloud computing can be used to facilitate scalable storage, effective communication among global teams and cost-effective infrastructure management that is essential in firms that handle various client portfolio in various jurisdictions (Ehioghiren & Ojeaga, 2022).

Cybersecurity has also become part of the risk management and assurance services of the Big Four in addition to cloud usage (Hasan et al., 2024). To keep the confidential data of the clients safe, these companies use the latest cybersecurity solutions that consist of encryption, multi-factor authentication, and threat detector. As an example, the latest encryption, continuous monitoring and advanced threat intelligence software has been integrated into Deloitte. Similarly, PwC has also built a holistic cybersecurity framework that manage sensitive financial information and focus on proactive threat management. With the help of these efforts, not only the digital properties of the firms are secured, but also, they create confidence in their clients and boost their image as a digital assurance leader (Hasan et al., 2024).

## THEORETICAL REVIEW

### Human Capital Theory

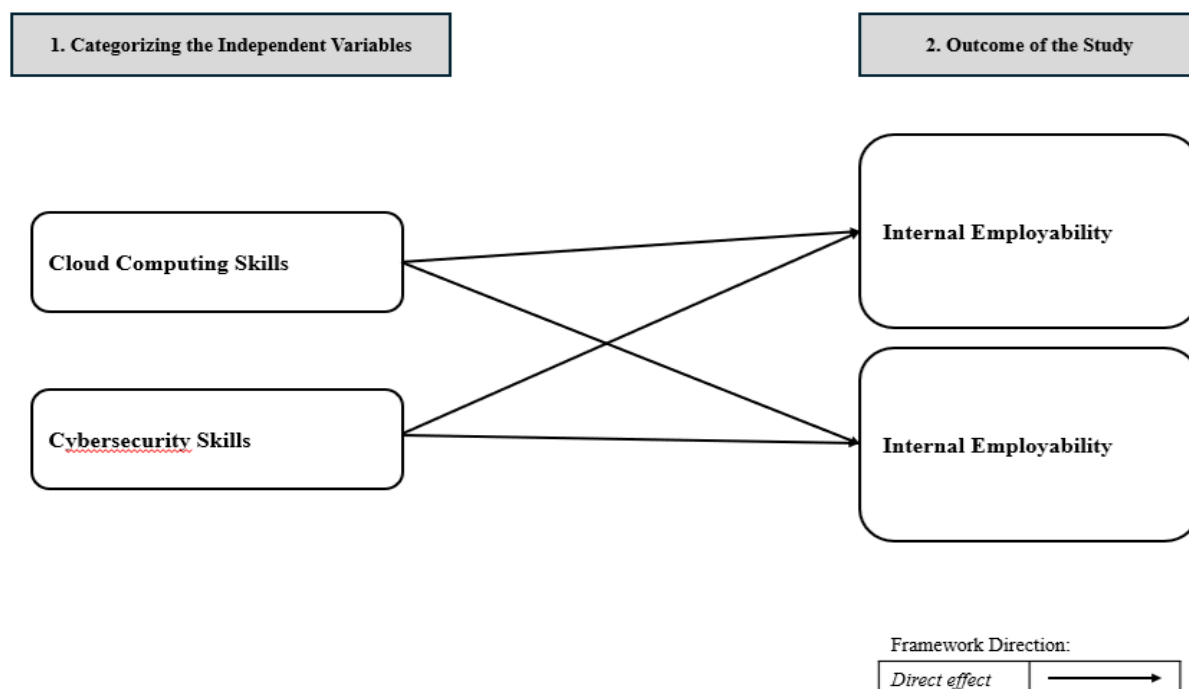
Schultz (1961) introduced the Human Capital Theory which emphasises the importance of education, training, and skill development in enhancing individual value. The theory states that the investment in these regions will yield positive outcomes in terms of employment. While Human Capital Theory has been traditionally used to explain traditional measures of career performance such as income and occupational status (Becker, 1993; Deming, 2023; Wittekind et al., 2010), it can also be a useful paradigm for understanding the concept of perceived employability. The human capital of accountants in this study is on the cloud computing and cybersecurity competences which is seen as essential in doing their work in the digital age (MIA, 2021, 2023; Ernst & Young Singapore et al., 2022). In this context, this research assumes that accountants with inculcated competencies are likely to report themselves as being more employable.

### Research Objectives

The study aims to explore the perceived effects of cloud computing and cybersecurity skills on accountants' perceived employability focusing on both internal and external employability.

## CONCEPTUAL FRAMEWORK

**Figure 1:** Conceptual framework for the study





## RESEARCH METHODOLOGY

This study aims to investigate the perceived employability among accountants working in the Big Four accounting companies in Malaysia that are focusing on the impacts of cloud computing and cybersecurity skills on their employability particularly in aspects of internal and external employability. Given the interest in quantifying these relationships, a quantitative research design with survey data obtained through stratified sampling is used to ensure that adequate representation of data between different departments (audit, tax & advisory) and at the hierarchical levels in Malaysia's Big Four accounting firms. Structural Equation Modelling (SEM) will be applied to analyse the data in SmartPLS, in a two-step strategy: (1) measurement model will be evaluated in terms of reliability and validity first and (2) structural model will be employed to test the hypothesised relationships.

### Research Propositions and Expected Results of the Research

This study is based on the Human Capital Theory which suggests that the perceived cloud computing and cybersecurity skills of accountants have a positive relationship with their internal and external employability. These digital competencies are a valuable human capital that can help accountants keep up with the changing digital workplace conditions and become competent contributors to the organisational outputs in the human capital perspective. The propositions emphasise that these cloud computing and cybersecurity skills represent a critical component of accountants' human capital. It shows the knowledge, abilities, and competencies that could enhance their value and productivity within the organisation. From this perspective, the development and application of such skills enable accountants to adapt to technological change, improve their performance, and strengthen their employability in the digital era.

The results of this study are expected to be twofold. First, it tries to add to the existing employability literature by empirically exploring the impact on accountants' perceived employability of skills, understanding and ability to apply cloud computing and cybersecurity. In the Human Capital Theory perspective, such digital competencies are great investments in knowledge and skills that make an individual more productive, adaptable and valuable in the workplace. Second, this research has the expectation that accountants who are conceptually and practically well versed in cloud computing and cybersecurity will perceive themselves to be more employable within and outside of their organizations. Internally, these skills add to the digital transformation processes while making the work processes more efficient and streamlined. Externally in ensuring greater mobility and economic marketability for accountants in their labour market where they are more competitive due to technological influence. Although the notion of human capital often refers to intellectual capital, this study finds that a complete conceptualization of human capital, including understanding and application of the cybersecurity of cloud computing, is important human capital as a sustainability of employers' employability to accountants in the digital era.

## CONCLUSION

The proposed research will make a substantial contribution to the body of knowledge on the role of technology competencies, particularly cloud computing and cybersecurity in influencing the employability of Malaysian accountants. The research is likely to show that the growing embedding of these technologies has had a profound impact upon the skills demanded of the accounting profession. Accountants who have a solid understanding and skill in the application of cloud computing and cybersecurity are in a better position to adapt to the changing job market, more effectively, and remain employable in an increasingly digitalized workplace.

Generally, the article indicates that employability in the accounting field is no longer limited to conventional accounting competence. It demands integrating digital skills like cloud computing and cybersecurity, which are accompanied by lifelong learning and professional flexibility. Such skilled accountants are more likely to gain internal employability in the form of better performance, teamwork and contribution to the digitalisation of the firms they work in, and at the same time will tend to increase their external employability by increasing their competitiveness and attractiveness in the overall labour market. The current study can be advanced in the future by investigating variations in the accounting industry or analysing the long-term impacts of digital skills training on career sustainability.

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