The Trend and Factors of Technology Adoption in Accounting

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Abstract: The modern world heavily relies on data collection, analysis, and asset creation, and as businesses continue to expand, the amount of data they generate increases as well. However, this data is only valuable when it is transformed into useful information that can be used by accountants to support their organizations. This practice is essential for companies to maintain a competitive advantage over their competitors in the market. The adoption of technology provides new opportunities and insights, leading to smarter business decisions, more efficient operations, and increased profits. However, technology has significantly impacted the role of accountants in recent years, which is a critical issue that requires their attention. With the rise of cloud computing, artificial intelligence, and machine learning, accountants have the potential to provide even greater value to their organizations by automating repetitive tasks, identifying trends and patterns in data, and offering predictive analytics to inform business strategy. Therefore, accountants must embrace these changes and leverage technology to their advantage to help their organizations stay competitive in the fast-paced business environment.

Keywords: Technology, accounting, accountants, data

1. Introduction

The field of accounting has experienced numerous advancements as a result of technology. The Institute of Management Accounts (IMA) and the Association of Chartered Certified Accountants (ACCA) have explored the potential impact of what they term as 'Digital Darwinism' on the future of accounting. Their study focuses on ten (10) technological developments that could significantly transform the market and professional landscape, including smartphones, big data, artificial intelligence and robotics, education, cloud computing, payment systems, virtual and augmented reality, digital services, and social services [5].

The Fourth Industrial Revolution was initiated by the explosion of data, leading to the emergence of various technology trends that are transforming industries through cyber-physical structures. It is vital for organizations to leverage these significant advancements and determine the most effective ways to integrate them. Accountants play a crucial role in this process and must analyze how six key innovations - Big Data, improved computing power, artificial intelligence (AI), the internet of things (IoT), autonomous robots, and blockchain - can be strategically integrated into their organizations' business plans [7].

The accounting sector can utilize various methods to explore systems and technologies related to their field. The Institute of Chartered Accountants in England and Wales
(ICAEW) has pinpointed AI, Big Data, Blockchain, and cybersecurity as technological advancements that are transforming the accounting industry [10]. Reports suggest that future accounting trends will focus on leveraging the capabilities of cloud computing, accelerating automation, and achieving breakthroughs with blockchain. These advancements have already been implemented across various industries, such as financial engineering and autonomous vehicles [26]. This article delves into various topics surrounding the integration of technology in accounting and the factors influencing technology adoption.

2. Literature review

2.1 The Similar Characteristic of Technology Adoption

The adoption of technology is influenced and hindered by various factors, irrespective of the type of technology implemented. A survey conducted on technology adoption among accountants in Malaysia revealed that business benefits are the primary motivator, followed by business demand, regulatory requirements, and the impact of younger generations [24]. However, certain barriers hinder the adoption process, such as high business costs, insufficient talent to utilize technology effectively, lack of knowledge of the benefits of adopting technology, lack of understanding of the advantages, insufficient business case to justify investment, and a lack of regulations. These advantages and disadvantages of technology present a dilemma and pose challenges to organizations looking to implement technology.

The adoption of technology offers significant benefits in terms of time and cost savings, as it eliminates the need for employees to perform tedious tasks previously required. Consequently, employees can devote more time to meaningful work, which reduces costs and increases productivity and efficiency. Time is a critical weapon for any organization in the business world. Efficient time management is essential for the smooth functioning and development of all public service institutions [4]. Furthermore, technology enhances a company’s capacity by enabling it to reach a broader customer base at a faster pace. It paves the way for a larger market, as businesses can interact with clients, potential customers, suppliers, and partners from any location worldwide, utilizing various technological communication tools.

Despite the high initial costs and ongoing expenses associated with adopting new technology, the benefits outweigh the drawbacks. Incorporating new technology often necessitates the training of current employees or the hiring of new staff, as well as ongoing investment in maintenance, upgrades, and training. Continual investment is required for technology innovation, and malfunctions can result in lost revenue, service interruptions, customer dissatisfaction, and even the loss of clients. To address technology-related challenges, the expertise of a skilled professional is essential.[3].

The use of technology exposes businesses to the risk of fraud and cybercrime. Cybercrime refers to any criminal activity carried out through computers or online channels. Criminals can exploit computer networks to commit crimes, and businesses can become victims of such activities. Cybercrime poses a significant threat to businesses because it allows criminals to access confidential information, steal money from bank accounts, and profit from the sale of stolen information. Despite improved security measures, hackers can stay one step ahead of the game. To protect client loyalty and confidentiality, it is crucial to monitor employees who have access to clients' and customers’ financial and personal data. However, employee monitoring may lead to privacy concerns, and companies must safeguard passwords and information access and screen personnel before granting them access to prevent cybersecurity breaches that could harm employee relations and increase costs[3].

A combination of technologies such as cloud computing, automation, artificial intelligence, and big data analytics (BDA) are utilized by the company, and their features tend to overlap. As a result, accountants mainly rely on a blend of these technologies.

2.2 Covid-19 Pandemic

The Covid-19 pandemic has had a significant impact on accounting operations, resulting in changes to work schedules and remote working arrangements. Due to the increasing workload, many accountants had to adapt to new technologies and work from home. As a result,
employees had to learn new skills and tools to work effectively, such as video conferencing and data sharing apps. The pandemic has led to a new era of employment, with many businesses rapidly transitioning to a remote work environment using cloud computing and other technologies. This shift has accelerated the adoption of technology in the accounting industry worldwide, reflecting the modern concept of the workplace [17].

2.3 The reaction of the Profession to Technology

The accounting sector recognizes the importance of technology advancements in achieving higher productivity, better quality, improved connectivity, and enhanced customer engagement. Maintaining competitiveness in the industry also depends on keeping up with technological changes and meeting customer expectations. To achieve this, it is crucial to recruit and train employees who are open to and can adapt to technological developments. Some accounting firms may require assistance in acquiring the necessary expertise, particularly those that are not tech-savvy [2].

Accounting firms are constantly seeking to expand their talent pool by looking beyond their own organization for young people [34]. They are taking steps to attract talent by enhancing salary and leave policies and offering flexible work arrangements [8]. However, the number of students enrolling in accounting programs in higher education institutions has decreased, resulting in a smaller pool of potential applicants. In fact, there has been a 40% reduction in overall candidates for accounting positions [2]. Furthermore, candidates must acquire the necessary knowledge and skills to meet customer demands for available positions.

The Malaysian Institute of Accountants (MIA) recognizes the importance of preparing the accounting profession in Malaysia for the fourth industrial revolution (IR 4.0) and meeting the global demand of the International Federation of Accountants (IFAC) to effectively adapt to technology. In response, MIA has created the MIA Digital Technology Blueprint, which outlines five ideas for developing digital strategies based on input from stakeholders in commerce and business, public practice, the public sector, and academia. It is crucial for accountants to be actively involved in the digital revolution and remain relevant, and MIA will provide guidance and support through education and, if necessary, direction. Ultimately, the only choice for accountants is to embrace technological advancements and adapt to the changing landscape.

2.4 Evolving Roles of Accountants

Reports indicate that technological advancements will result in a 40% reduction in finance staffing levels by 2025. Automation of tasks that were once performed by entry-level accountants has led to flattened corporate structures and decreased employment in lower-level positions. In order to succeed in their roles, accountants must work closely with colleagues from other departments and have a solid understanding of technology. For example, auditors can supervise and control operations in a private blockchain, resolve disputes among users of a shared blockchain, investigate the source of intelligent contracts, or assess the stability of blockchain platforms.

Compared to before, early-career accountants now require specific skills and expertise, and must demonstrate business acumen and sound judgement much earlier in their careers [36]. Rather than focusing solely on transactions, it is now important to collect and analyze data, as well as engage with customers in order to advise them on how to improve and expand their businesses. With automation taking over many tasks, there is a growing demand for highly skilled professionals who can optimize resources, develop processes, and control costs, all of which require critical thinking, problem-solving, and decision-making skills.

The accounting profession is witnessing a shift towards specialized knowledge, including governance, social responsibility, and environmental issues, leading to significant changes in the demand for their services. Nowadays, accountants are often required to function as "virtual CFOs," using benchmarking data and business planning tools to monitor the company's competitive position [7]. To attract, serve, and retain clients, accounting firms need to expand into new markets and remain flexible in response to changing business needs. The accountant's
role has transformed from being just a "bean counter" to providing strategic counsel, requiring a holistic understanding of the entire organization and the ability to provide analytics, forecasts, and strategic guidance based on informed decision-making[8].

2.4 Factors Influencing Technology Adoption

Several technological innovations were created due to the data explosion that gave rise to IR 4.0. The organisations should determine the best way to leverage these trends. To implement company plans, accountants must evaluate how to employ these technologies [7] strategically. Having said that, after determining the variables affecting the adoption of new technology, accountants should take the initiative to address these problems and aid their firms in implementing the latest technology. The Technology, Organisational and Environmental (TOE) paradigm was initially developed to explain how contextual factors affect an innovation's acceptability [37]. According to this concept, the technological, organizational, and external environmental contexts will impact how well the firm adopts technological innovation.

2.5 Technological Factors

Big Data Analytics (BDA) and Robotic Process Automation (RPA) are two examples of hybrid technologies used to define peer rivalry, outside support, and regulatory support. This is due to the fact that, as was previously said, they share traits that are relevant to embracing technology.

Complexity measures how difficult innovations are to comprehend and use, and it is typically inversely correlated with acceptance [15]. The quantity and diversity of relationships and components within a specific category can be used to calculate complexity. Cyber-physical structures operate in an ever-changing environment and comprise several heterogeneous specialised equipments. Product innovation becomes complicated when data analysis and technological integration are integrated with business processes. To facilitate the seamless integration of data sharing among corporate operations, technical communication standards and protocols must be established.

Compatibility is the extent to which technological innovation may be easily absorbed into existing infrastructure and operations [12]. Innovation compatible with current practises and technological infrastructure is more likely to be adopted [20]. A significant transformation for a firm is the switch from centralised manufacturing to decentralised (self-adaptive) managed production. For small organisations, every change that adheres to the corporate culture is crucial [15]. Otherwise, if resistance is not properly handled, it could impede adoption.

Information can be acquired from numerous sources and input channels, making online processing highly difficult because various signal inputs must be synced, and different data kinds must be processed simultaneously. However, the information gathered also includes a variety of inputs that are not necessarily precise or comprehensive because of many sources of uncertainty, inaccuracy, and missing data (e.g., malfunctioning or inaccurate sensors). Moreover, high-speed data processing, storage, and retrieval are essential for using the relevant study findings in practical applications [30]. In order to ensure that there won't be any compatibility concerns during the adoption process, all of these aspects should be taken into account.

The organization's current beliefs or ideals should be compatible with the changes brought about by the advent of technology. A second competitive advantage demonstrates that technology is one approach to improve a company's internal processes: the capacity to align IT with business strategy. The capacity to enable quick responses to changes in the market environment in which enterprises act is the next benefit, which is most frequently acknowledged by businesses [19].

The compatibility quality has to deal with the advantages that come with innovation adoption. If the invention does not fundamentally alter the way of life of the existing fashion, people or organisations will probably accept it. Automation technology can be adopted more simply in the informal economy the more compatible a technology is, as this requires less change in the way things are done and in the tools used. The less probable it is that an invention will be adopted if it calls for changing the way
that work is now done through mechanics.

Adoption of new technology is influenced by compatibility [11]. In this context, compatibility is the extent to which innovation is deemed to be in line with pre-existing ideas or prior knowledge as well as the demands of the adopter. Because it works with the organization’s current infrastructure, technology is compatible. If the organization must adapt its current procedures mechanically or if innovation or creativity clash with its values, it is doubtful that it will accept the technology.

The relative benefit measures how much more money the company will make after implementing innovation than it would have before [12]. The relative advantage indicates strong demand for any technologically enabled productivity gains. Robotic Process Automation (RPA) is one of the technologies for this relative benefit because it shares the same properties as those previously described technologies (RPA). RPA is a technique that tries to automate repetitive and boring processes now carried out by human system users. In fact, Deloitte’s worldwide RPA suggested that RPA would improve quality, enforcement, and performance [36]. The majority of these jobs are operational and routine, but they can also be improved upon and altered, especially if the underlying structures on which RPA is based evolve. The systematic and repetitive nature of payroll, accounts payable, and accounts receivable-related procedures makes them clear prospects. It’s important to note that RPA apps improve task efficiency rather than outsourcing labour to a bot.

Technology can offer a business useful data for making decisions. The ability to make choices and take reporting actions to assist managers is emphasised by the term “decision support capabilities.” Typically, this capability provides data and information that may be shared, such as historical reporting, executive summaries, drill-down queries, statistical analyses, and time series comparisons. Contrary to transitional IT systems, the reports generated by the BDA systems demonstrate that it is equally beneficial to analyse the past and the present operational environment at all organisational levels.

2.6 Organizational Factors

One of the components for successful technology adoption has been identified as top management support [32]. The pace at which technologies are adopted at the organisational level is greatly influenced by top management. Top management support is crucial since it has the ability to make the shift and apply that technology, according to one of the most recent technological advancements, the cloud technology [28]. Top management has made a decision in favour of this organisational shift. A corporation can receive top management support by being given the technological tools it needs. To get the greatest rewards from investments in emerging technologies, organisations have to improve over time.

Low-cost innovations are more likely to be adopted by organisations [37;20]. A major barrier to adoption for small enterprises is resource allocation [22]. The physical world is constrained by resources, and data is expensive. Even though there are often opportunities for economies of scale, data collecting expenses normally rise.

The distribution of resources is another aspect affecting how quickly people accept new technology. To handle it, the organisation needs sufficient cash flow support. But, in today’s world with fixed budgets, there may be a trade-off between quality and quantity. When drawing the right conclusions, small data can occasionally outperform big data and do so more quickly, precisely, and affordably [27].

Another factor to consider is how technology use varies significantly depending on the size of the business and the manufacturing industry. The number of employees, acquisitions, the target market, and yearly sales could all affect the size of a company [22]. When deploying a new technology that can require a sizable expenditure, the organization’s overall resources and profits may be taken into consideration relative to the industry. These software platforms enable companies to convert big data collections into insightful knowledge that supports operational procedures and managerial decision-making. Also, they make it possible to track patterns to scrutinise and make the best strategic judgements [13].

2.7 Environmental Factors

Firstly, factors in peer rivalry, outside assistance, and
regulatory support are described using hybrid technology, such as big data analytic (BDA) and cloud computing. This is due to the fact that, as was previously said, they share traits that are relevant to embracing technology.

Next, peer competition as technology is quickly becoming a popular activity that benefits businesses by encouraging peer rivalry to acquire a competitive edge for the early adopter. Thus, to improve operational effectiveness, many businesses are adopting analytical techniques. Due to the intense rivalry in the unstable business environment of emerging nations, organisations are adopting cutting-edge information technology for competitive advantage [33].

Companies believe that utilising technology is essential for success in the marketplace. The business will be at a competitive disadvantage in the market if it does not adopt the technology. BDA, for instance, enables firms to run their operations more effectively and profitably by boosting customer service and motivating marketing and sales teams [9]. In a highly competitive market, competitors may pressure a corporation to adopt advances. Some businesses succumb to this pressure and adopt cloud computing technologies, more commercial space, and improved operational performance [28].

The corporation would also be encouraged to implement the technology from external sources such as stakeholders, trading partners, outside suppliers, and organisations offering incentives and training. Trading partners would gain from the company's usage of a technology that can facilitate and streamline transactions. Manufacturers or partners using technologies like cloud computing will also profit from this. Therefore, this can encourage a business to use this technology [28].

Finally, regulatory support also affects how quickly technology is adopted. Database rights and data sets are governed by national or international legislation that addresses appropriate usage, improper use, and enforcement. Regarding individual rights to maintain private personal or commercially significant data, governance, and legal frameworks should decide based on national and international mutual interests. This worry is caused by the fact that no rules or regulations from the government can shield the business in the event of a data breach. A severe problem that might cause choices about technology adoption to be postponed is the absence of information technology requirements [28]. The people should be held more responsible if they have the power to influence governments and policies about data usage. One thing to consider is who must abide by these regulations and whether they are legally binding. They are hoped to aid the modern profession's digitization revolution.

3. Discussion
The TOE model is usually applied to studies of technology adoption [35] (Sun et al., 2018). TOE, which is based on technological, organisational, and environmental contexts, can serve as a foundation for analysing and contemplating relevant factors for comprehending innovation-adoption decision-making. Tornatzky, Fleischer, and Chakrabarti (1990) created the TOE framework to characterise the impact of contextual factors on innovation acceptance. In this framework, the technological context, the organisational context, and the external environmental context will influence the adoption of technological innovation within an organization [37].

The technological framework includes both internal and external business-related technologies. The organisational context refers to the nature and resources of the company. The environmental context, meanwhile, refers to the parties surrounding the enterprise. The TOE framework is recognised as a multidimensional model with greater exploratory capacity than a model with a single dimension[31]. This interactive approach assumes that changes in an organisation are influenced not only by individuals, but also by the organization's characteristics, and it is believed that this perspective adequately explains the adoption of information technology innovation [9]. In this way, accountants can assist an organisation in making informed decisions regarding embracing and facilitating future changes by gaining a comprehensive understanding of the context in which it operates.

4. Conclusion
To be suitable with the created data of today, an accounting framework that might incorporate technology into business operations is becoming more and more
necessary. Along with comprehensive non-financial data, accounting and financial data from several corporate organisations across the globe appear to generate even more data than in the past. In order to manage this information, businesses need the appropriate technology and resources [1]. Thus, it is essential to determine what role accountants should play in resolving these issues with the current accounting information system.

With the aid of technology, accounting data can be recorded, and business operations may be managed more quickly. Many innovations have made accountants' jobs easier by improving information generation speed, quality, and openness in the decision-making process. The primary responsibility of an accountant, information generation, was optimised using these technical resources [30]. Technology must be used to speed up accounting data processing and to increase firms' efficiency and confidence in the auxiliary services they depend on to conduct their operations. Accountants are crucial to the development of accounting and the application of technology [30]. This is because resources to aid accountants in their work and enhance the value of their services are increasingly invested in as the industry and governmental regulations evolve.

Information technology refers to processes and products that make it possible to collect, store, access, manage, and use data. Thanks to technology, accountants now have a different perspective, having given up mountains of books and papers in favour of automated processes and routines supported by digital storage. With the invention of the internet, distances were erased, and interactions that took hours or even days were cut down to seconds. This simplified and streamlined communication improved the day-to-day of the professional. Modernizing a technology park is now essential to maintaining a company's competitiveness. Because information technology directly impacts an organization's survival, accountants should consider it a business strategy [16]. Information technology has, in fact, greatly aided accounting departments [21].

In fact, the time needed for accounting experts to compile and present financial data to management and stakeholders has been dramatically reduced by computer networks and systems. The efficiency and accuracy of the information have also enhanced due to the use of these new technologies. They signal the beginning of a new era in that brilliant apps will dominate. They may also make it easier to find information to support decisions [18].

The accounting sector is evolving quickly, and new developments are being made regularly to enhance customer service. Accounting is now dealing with more exact numbers, and errors are getting smaller. Increased efficiency, improved service, and increased information security are just some of accounting automation's many advantages. Brazilian institutions have used technology extensively, both strategically and operationally, and it has been acknowledged as a crucial element of the current corporate environment [29].

In conclusion, accountants are now essential for tracking and overseeing operations, which raises the calibre of services offered. To be considered valuable, an accounting information system must meet the operational and management demands of the company by disseminating information to all sectors and tying them to the company's operations. Digital technology improvements have dramatically increased accounting's capabilities, making knowledge of the organization's numerous departments, departments, and employees crucial. Accounting practises changed over time, and there have been transitional periods for the profession. The technological phase quickly followed the mechanical phase in dominance and then the phase of implementing digital technology. Since then, the accountant has attempted to take on a job more, unlike the previous bookkeeping role. Accounting professionals must stay current with market changes and maintain their abilities in light of this new reality. They must be able to disseminate reliable data that aids organisations in making wise decisions.

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5.0 References


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