Application of Industry 4.0 Technologies in Accounting Profession: Evidence from Sri Lanka

Article *in* Journal of Business and Technology · July 2024

DOI: 10.4038/jbt.v8i2.125

3 authors, including:

H.M.M.N. Herath
University of Kelaniya
11 PUBLICATIONS **5** CITATIONS
SEE PROFILE

Dilini Aruppala
University of Kelaniya
23 PUBLICATIONS **32** CITATIONS
SEE PROFILE

DOI: https://doi.org/10.4038/jbt.v8i2.125

JBT

Journal of Business and Technology

International peer-reviewed journal | Publish semi-annually

Application of Industry 4.0 Technologies in Accounting Profession: Evidence from Sri Lanka

Dharmasena I.P.N.[1], Herath H.M.M.N.[2*] and Aruppla W.D.N.[3]

[1,2,3]Department of Accountancy, University of Kelaniya

[*]Corresponding Author: malindah@kln.ac.lk

Abstract

The world of technology is rapidly changing and evolving. It has positive and negative consequences on every sector of the world, directly or indirectly. The aim of this paper is to examine the impact of Industry 4.0 technologies on accounting and auditing professionals in Sri Lanka and the study examines the perception of professionals. The concept of Industry 4.0 can be identified as a synthesis of various technologies, including artificial intelligence, big data, cloud computing, and robotic process automation etc. This study focuses on four major technological innovations and examines how the major technological changes in Industry 4.0 are affecting the accounting and auditing profession in Sri Lanka. These include artificial intelligence, big data, cloud computing, and robotics. Data was collected through a survey questionnaire which is shared among the professionals using an online survey method. A mean value analysis was conducted using SPSS analytical software. Findings of the study revealed that Industry 4.0 has a significant impact on the development of the accounting and auditing process and on the auditing and accounting profession. In addition, the study reveals that accounting and auditing professionals need to develop their skills and competencies to work with new technologies. The researcher expected that this will enable future accounting professionals to develop a keen interest in developing the skills and competencies they will need to successfully meet these challenges.

Keywords: Accounting Profession, Artificial Intelligence, Big Data, Cloud Computing, Industry 4.0, Robotics, Technology.

INTRODUCTION

Understanding and shaping the new technological revolution that is the beginning of a societal change is one of the most diverse and fascinating challenges that everyone faces today. Individuals are at the start of a revolution that will radically alter the way we work and interact with one another. Klaus Schwab, founder and President of the World Economic Forum, introduced the concept of 'Industry 4.0' as the fourth industrial full revolution, unparalleled in its magnitude, scope, and complexity, marking a significant departure from previous human experiences in technological advancement (Benioff, 2017).

History of the Industrial Revolution

Industry 4.0 is a new concept, but it can be called a new version of a process that happened in the past. Therefore, this process cannot be expected to end. Industry 1.0 began around the 1780s with the introduction of water and steam power which helped in mechanical production and improved the agriculture sector greatly. With the use of water and steam technologies in production, tools and manpower-oriented workshop-type production began to be abandoned and started to move to machine-oriented factory-type production (Özcan and Akkaya, 2020).

Next, Industry 2.0 is defined as the period when mass production was introduced as the primary means to production, in general. This revolution transition from steam power to electrical energy. Electricity, oil, and gas are used as production power. The production line design used by Henry Ford, the pioneer of the serial production system, has become an example for many sectors and started to be applied. The mass production of steel helped introduce railways into the industrial system which consequently contributed to mass production at large.

Industry 3.0 emerged with the advancement of digital technology. The direct result of this is the great development of computers, information and communication technologies. With the development of this technology came the ability to exchange information very quickly and thus the concept of globalization emerged. The demand for labor continued to decline and the use of programmed machinery for various production processes increased rapidly. The rapid development and integration of computer hardware, software, networks and digital technologies, which are the determinants of the industrial revolution, transformed society and the economy (Özcan and Akkaya, 2020).

Adoption and Implementation of Previous Industrial Revolutions in Sri Lanka

While the global progression from Industry 1.0 through 3.0 has significantly transformed economic structures and technological capabilities worldwide, the pace and extent of adoption vary significantly across different nations. In Sri Lanka, the adoption of these industrial revolutions has been marked by both challenges and gradual progress. Historically, the shift from mechanical to mass production, and later to digital technologies, was influenced by the country's focus on sectors like textiles and apparel, which leveraged these technological advances to enhance production efficiency and global competitiveness. However, the transformation into digitalized processes (Industry 3.0) has been less uniform, particularly within the accounting and auditing profession. Many firms are still transitioning from traditional practices to more digital-based operations, indicating a lag in the full integration of digital technologies. This historical context sets the stage for evaluating the preparedness and impact of Industry 4.0 in Sri Lanka, particularly within the accounting and auditing sectors. As Industry 4.0 introduces a more profound

integration of cyber-physical systems and data analytics, understanding the readiness and adaptation strategies of Sri Lankan firms becomes crucial. This backdrop is essential to explore how prepared the local accounting and auditing profession is to embrace the profound changes brought forth by the fourth industrial revolution, thus highlighting the originality and contribution of the study in filling this significant gap.

"Industry 4.0" is the digital and automation of production systems by humans and machines in the current scientific and economic context, as well as the use of new technologies in a more effective way by networking their function (Wadan et al., 2019). It can also be called the advent of completely new capabilities and "cyber physical systems" that connect people and machines. This era is expected to affect job risk, especially among graduates. Humans are largely being replaced by computerized jobs, according to their study, which found that less than half of jobs in the U.S. are at risk of redundancy due to industry 4.0, so robots can perform not only normal tasks but also modern tasks. The findings suggest that while Industry 4.0 offers opportunities for those willing to embrace it, this era also poses major challenges for traditional careers; The accounting profession is no exception (Ghani and Muhammad, 2019a).

Industry 4.0 has changed the structure and scope of the qualification profile of accountants, creating new and challenging requirements for their skills and competencies. To perform their job tasks more comfortably in the organizational environment of the “digital enterprise”, accounting specialists must be transformed into hybrids with interdisciplinary knowledge and diversified skills and abilities. This interdisciplinary specialization should be reflected in their vocational education and training. Many professional accounting firms, such as the Association of Chartered Certified Accountants (ACCA), the Institute of Chartered Accountants of America (ICAEW) and the Chartered Global Management Accountants (CGMA), have already introduced information technology and are beginning to change the content of their qualification modules. Data analysis into the syllabus. Accounting scholars are also under a lot of pressure to improve the technical content of accounting courses. Programs must adapt to the ‘Curriculum and Modules’ curriculum and continue to interact with changing labor market needs and the expectations of graduate employers (Stancheva-Todorova, 2019).

Problem Statement

The advent of Industry 4.0 has triggered significant transformations across global industries, reshaping the landscape of business processes, production systems, and technological integration. Several studies internationally have delved into the implications of Industry 4.0 on accounting systems, corporate sustainability, data analytics, and the challenges posed to accounting practitioners. However, a gap remains in understanding the specific impact and preparedness of the accounting and auditing profession in Sri Lanka amidst the Industry 4.0 revolution.

Research Objectives

The main objective of this study is to provide an answer on how the latest technological changes in Industry 4.0 affect the development of the accounting and auditing profession in the Sri Lankan context. Accordingly, the following sub-objectives should be achieved in order to achieve the main goal: To examine the impact of Industry 4.0 on accounting and auditing professionals in Sri Lanka.

1. To investigate the influence of the use of artificial intelligence on the development of the accounting and auditing profession.
2. To investigate the influence of the use of big data on the development

of the accounting and auditing profession.

3. To investigate the influence of cloud computing on the development of the accounting and auditing profession.
4. To investigate the influence of robotics on the development of the accounting and auditing profession.
5. To investigate how the development of industry 4.0 influences and shapes the skills and competencies of accounting and auditing professionals.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

With the advancement of information technology in Industrial Revolution 4.0, the field of accounting and auditing is undergoing a major transformation. Specifically, the use of technology-based accounting has significantly improved efficiency in terms of time, labor, and cost. Moreover, the growing integration of information technology in accounting has enabled the production of accurate financial reporting outputs (Rosi and Mahyuni, 2021).

In this context, Damayanti (2019) examined the impact of Industry 4.0 on the accounting system, focusing on four key areas: real-time accounting, big data, intellectual capital, and accounting professionals. This study essentially argues that traditional accounting systems are not well-suited for the digital age, noting that the new digital system requires more intangible investments than physical assets. Additionally, the debate over the measurement of intangible assets in today's digital system increasingly centers on Big Data.

Big data, characterized by vast and complex datasets, involves managing large volumes of heterogeneous digital data, often measured in terabytes or petabytes (Ishwarappa and Anuradha, 2015). The analysis of big data can reveal hidden patterns, correlations, market trends, and consumer preferences, aiding organizations in making informed business decisions. However, traditional accounting systems struggle to effectively record the structures of Big Data. Consequently, accountants need to be proficient not only in accounting but also in IT knowledge to manage Big Data and develop real-time accounting systems that can handle new measurements of intellectual capital.

Furthermore, Stancheva-Todorova (2019) investigated the impact of business digitization and technological innovation on accounting higher education. The study argues that universities must continuously revise and adapt their curricula and syllabi to successfully meet the challenges of the Fourth Industrial Revolution. Concurrently, professional accounting firms should provide research, guidance, instruction, and training on digital enterprises. This study underscores the necessity of these changes.

Similarly, Kim Lien Tran et al. (2019) explored the impact of Industrial Revolution 4.0 on the accounting profession in Vietnam. They found that advancements such as artificial intelligence, cloud computing, blockchain, and automation of data entry have significantly improved accuracy and diversity of inputs. However, these advancements also pose challenges for Vietnamese accountants, including the need for IT skills, adaptability, and global language proficiency. The article proposes solutions to help Vietnamese accountants develop and adapt to these new demands.

Additionally, Ghani and Muhammad (2019) investigated employers' expectations of accountants and graduates regarding their knowledge and skills before recruitment. Using a qualitative approach with accounting professionals and scholars, this study shows that employers' expectations of accounting students are

likely to change significantly in an Industry 4.0 environment, particularly concerning the technologies used to process, report, and disseminate financial information.

The financial sector, being one of the most data-intensive sectors globally, naturally sees a significant impact of big data on accounting. Companies should regularly identify and assess the risk factors affecting their business performance, such as those associated with mergers and acquisitions, fraudulent activities, and supply chain risks. The advantage of big data in accounting lies in its potential to significantly improve risk management through consumer behavior analysis, forecasting economic trends, and more. Examples include liquidity risk management and debt risk management

Another significant impact of big data on accounting is the advent of cloud technology and real-time reporting. The integration of big data and cloud technology enables accountants and auditors to provide real-time insights to their clients. This allows companies to enhance the value of their data through robust valuation systems and quality control, sharing data effectively with stakeholders, and collaborating with other departments. Moreover, the ability to identify fraud in real-time and use predictive analysis to assess long-term investment risks increases the efficiency and effectiveness of accounting information.

One of the biggest technological trends now is the emergence of cloud technology. Cloud platforms allow data and software to be accessed online anytime, anywhere, from any device with an internet connection. Businesses subscribe to accounting software from specialist service providers rather than purchasing and installing the software themselves. This approach transforms the use of accounting applications and modernizes the business environment (Khanom, 2017). Cloud accounting eliminates the need for upfront IT service and installation fees and ensures that updates to accounting rules and tax regulations are included in subscription costs and applied automatically by the provider. This minimizes the hassle of manual updates and saves time and money.

Robotic Process Automation (RPA) further enhances accounting and auditing by automating repetitive, rules-based tasks. RPA software can quickly and accurately transfer data, freeing valuable resources from mundane tasks. Benefits include cost reduction, improved control, faster processing speeds, better data quality, and increased job satisfaction among financial team members (Association of Chartered Certified Accountants, Chartered Accountants Australia and New Zealand, and KPMG, 2018a). From an audit perspective, RPA can automate tasks such as reconciliation, internal control testing, and detail testing, allowing auditors to focus on complex areas and investigate potential discrepancies, ultimately leading to higher audit quality (Moffitt, Rozario, and Vasarhelyi, 2018).

In summary, the integration of technologies such as big data, cloud computing, and RPA within the framework of Industry 4.0 has profoundly transformed the accounting and auditing fields. These advancements demand that accountants possess not only traditional accounting skills but also proficiency in IT and data analysis. By understanding these technological impacts and preparing future accountants through revised education and training programs, the accounting profession can better meet the evolving needs of the business world in the digital age.

Technological competency of Accounting Professionals

The accounting profession will always support businesses of all types and sizes. Professional accountants are evolving into leaders, trusted expert advisors, and key strategic advisers in both public and private sector organizations. To effectively

navigate emerging technologies and add value to employers and clients, prospective professional accountants and auditors will require a diverse combination of professional skills. These include technical knowledge, abilities, and interpersonal qualities such as intelligence, creativity, emotional intelligence, vision, experience, and digital expertise.

The Association of Chartered Certified Accountants (ACCA) provides accountants and audit professionals with the future skills needed and an understanding of how they can adapt. According to ACCA, the following skills should be developed in accounting and auditing professionals:

- Technical and Ethical Skills: The ability to consistently work to a defined standard, maintaining the highest standards of integrity, independence, and skepticism.
- Intelligence: The capacity to acquire knowledge and think logically, solving problems using the knowledge gained.
- Creativity: The ability to apply existing knowledge in new situations, identify new relationships, explore potential outcomes, and generate new ideas.
- Digital Proficiency: Awareness and application of existing and emerging digital technologies, capabilities, applications, strategies, and culture.
- Emotional Intelligence: The ability to recognize and manage one's own and others' emotions, apply them to tasks, and regulate them effectively.
- Vision: The ability to accurately predict future trends by analyzing existing trends and facts and filling in gaps with innovative thinking.
- Experience: The skills and ability to understand customer expectations, meet their needs, and create value.

These skills are outlined in the ACCA's report "Professional Accountants – the Future: Drivers of Change and Future Skills" (2016), highlighting the importance of a well-rounded skill set for future accounting professionals.

Based on the comprehensive literature review, it is evident that the integration of advanced technologies is profoundly transforming the accounting and auditing profession. Emerging technologies such as artificial intelligence, big data, cloud technology, and robotic process automation are not only enhancing the efficiency, accuracy, and effectiveness of accounting practices but also reshaping the required skill sets for professionals in this field. These technological advancements are driving a shift towards more data-driven decision-making, real-time financial reporting, and automated audit processes. Consequently, accounting and auditing professionals must develop a diverse combination of technical, digital, and interpersonal skills to adapt to these changes and continue adding value to their organizations.

The following hypotheses have been developed based on these insights:

H1: The use of artificial intelligence has a significant influence on the accounting and auditing profession.

H2: The use of big data has a significant influence on the accounting and auditing profession.

H3: The use of cloud technology has a significant influence on the accounting and auditing profession.

H4: The use of robotic process automation has a significant influence on the accounting and auditing profession.

H5: These rapidly evolving technologies have a significant influence on the skills and competencies of accounting and auditing professionals.

METHODOLOGY

Population and Sample

The sample framework considered for the hypotheses test is professional and / or academically qualified and Sri Lanka based

accounting professionals and accounting staff. Professional accountants and accounting professionals in the business are diverse, working in the public and non-profit sectors such as commerce, industry, financial services, education and as employees or consultants. Many people, in strategic or proactive leadership, or in some other way collaborate with colleagues in other disciplines and contribute to the sustainable success of their organizations. Professional accountants assist their organizations in a wide range of job functions, including leadership and management; Operations; Management accounting and control; And accounting and stakeholder communication. They are very well exposed to the technological advancements that have taken place in the profession. Also, accounting professionals have to adapt quickly to new technological innovations related to accounting, so professional accountants and accounting staff are selected by the population because they have good professional experience and as they use and expose technology in their work environment. A representative sample is selected based on the availability of contact information of individuals from a population of limited to 134 respondents from Sri Lanka Accounting and Auditing Services Professionals and Accounting staff in Sri Lanka. The convenient sampling method is used for the study.

Research Approach and Methodological Choice

According to the context, the deductive approach has to be used to conduct this research on the topic of "industry 4.0 and Accounting profession in Sri Lanka". The quantitative technique is used for the study because close-type questionnaires (which limit respondents' answers to response options provided on the questionnaire) and hypotheses are used to assess the influence of industry 4.0's technology for accounting professionals in Sri Lanka. The study mainly depends on the quantitative analytical methods using data gathered by the author.

Data Collection and Measurement

The main source of data collection considered under this study was a questionnaire compiled using current literature on the impact of industry 4.0 on the accounting and auditing profession. Accordingly, the research was carried out using primary data sources. The questionnaire was distributed using a randomized online system among Sri Lankan accounting professionals. The variables in the research model (industry 4.0 and accounting profession) were measured through questionnaires with five-point Likert Scales and nominal scales, which were completed by professionals and accounting staff themselves appropriately as they perceived they responded to each question.

Data Analysis Technique

Data collected from the survey questionnaire is analyzed using SPSS 16.0. A preliminary analysis is performed using descriptive factors to describe the sample and to see if the sample represents a population. To examine the impact of new technologies in industry 4.0 on the accounting and auditing profession using detailed statistics such as frequency analysis and measurements of median trend. Also, sub-variables are analyzed using a one sample t-test to study whether there is a statistically significant difference relative to the Likert scale mean value to study the impact of new technologies in industry 4.0 on the accounting and auditing profession.

DATA ANALYSIS AND PRESENTATION

The questionnaire is used to determine how industry 4.0 affect to accounting and auding profession in Sri Lanka. In this research process, all the collected data from 134 respondents has been categorized and analyzed. The respondents of the study are

the users of industry 4.0 technologies. At the introduction paragraph of the questionnaire, it is requested to take part in the survey if the respondent is aware and using these technologies. Demographic analysis is conducted to identify the sample profile. And mean ranking analysis is done to identify the existing use of industry 4.0 technologies among accounting and auditing professionals.

Demographic Information

Table 1: Demographic Information

Category	Frequency	Percentage (%)
Age Group		
Above 40 Years	36	27
30-40 Years	58	43
Less than 30 Year	40	30
Education level		
Diploma	26	20
Belcher	86	64
Master	14	10
PhD	8	6
Experience		
1-5 Years	62	46
6-10 years	40	30
11-15 years	18	13
More than 16 Years	14	11

The age ranges of respondents to the study were measured in age groups. Accordingly, 36 people over the age of 40 years responded to this study. It is 27% of the total respondents. 58 people between the ages of 30 and 40 years responded to the study. It is 43% of the total respondents. and also 40 people under the age of 30 years responded to this study. It is 30% of the total respondents.

The percentage of the study sample of Ph.D. holders is (6%), while the percentage of those who hold a master's degree is (10%), while those with a bachelor's degree were (64%) and the percentage of those who hold a diploma is (20%). Consequently, the sample of the study that answered the questionnaire is those with specialization in the field of accounting and auditing and holders of high and intermediate academic qualifications that were targeted by the study.

A percentage 46% of the study sample is 1- 5 years of service in the accounting and auditing profession, while the percentage of those whose years of service range from 6 years to less than (10) years is 30%. The percentage of those whose years of service was between 11 years and less than 15 years was 13%, while the percentage of their years of service was more than 16 years 11%, which reflects that the study sample is of those with experience in the accounting process.

Analysis of Reliability

The reliability of the instrument was measured using Cronbach's Alpha analysis. It measures the internal consistency of the instrument, based on the average inter-item correlation. The result of Cronbach's alpha test is shows in table 4.4 – 4.8 which suggests that the internal reliability of each instrument was satisfactory. All the Cronbach α value is above 0.7 indicates an acceptable internal consistency of the scale (Sekaran and Wiley, 2017) Table 2 demonstrates the reliability of the independent variable and the dependent variable. According to this study, the overall variable Cronbach's Alpha Coefficient for industry 4.0 technology includes dimensions of Artificial intelligence, Big data, Cloud Computing, Robotic Process Automation, and Cronbach's Alpha Coefficient for Professional skills and competencies.

Table 2: Analysis of Reliability

Variable	No. of Statements	Cronbach's Alpha
Artificial Intelligence	4	0.744
Big Data	4	0.845
Cloud Computing	5	0.843
Robotics Process Automation	5	0.821
Professional skills and competencies	5	0.728

In this study, the reliability of various variables was assessed using Cronbach's Alpha. Artificial Intelligence demonstrated acceptable reliability with a Cronbach's Alpha of 0.744, while Big Data, Cloud Computing, and Robotics Process Automation exhibited good reliability with values of 0.845, 0.843, and 0.821, respectively. These findings suggest that these variables—AI, Big Data, Cloud Computing, and Robotics Process Automation—can be considered reliable for this study. However, the variable of Professional skills and competencies showed acceptable but slightly lower reliability with a Cronbach's Alpha of 0.728. Despite being acceptable, it falls below the levels of the other technological variables assessed in this study.

Hypothesis testing

To test the study hypotheses, the arithmetic mean, and standard deviation of the relative arithmetic mean were calculated, as well as using the value of the (T) test for one sample (One Sample T test) to analyze the paragraphs of the questionnaire and test the hypotheses.

H1- *The use of artificial intelligence has a significant influence on the accounting and auditing profession.*

Table 3: Statistics for artificial intelligence

No	Statement	Mean	Standard deviation	%	T - Value	The probability value Sig	Rank
01	The use of artificial intelligence leads to improved accounting accuracy.	3.93	0.903	78.6%	11.961	0.000	3
02	The use of artificial intelligence can reduce the likelihood of	4.02	0.871	80.4%	13.586	0.000	1

	financial fraud to some extent						
03	The use of artificial intelligence leads to improved ability to cope with enterprise risk	3.93	0.939	78.6%	11.409	0.000	3
04	The use of artificial intelligence can improve the quality of the audit	3.99	0.836	79.8%	13.740	0.000	2
	Total Degree	**3.96**	**0.887**	**79.2%**	**12.672**	**0.000**	-

According to the table 3, the mean of all the expressions of the table is greater than the fixed neutral mean value, which is represented by the number (3) between acceptance and non-acceptance, as the mean for the indicators of the table ranged between (3.93-4.02). Indicators (2) I got the first place, which states: "The use of artificial intelligence can reduce the likelihood of financial fraud to some extent" with a mean of (4.02) with a relative weight of (80.4%), and a value of (t) It reached (13.856) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000). The last rank came to indicators (1) and (3), which states: "The use of artificial intelligence leads to improved accounting accuracy." And "The use of artificial intelligence leads to improved ability to cope with enterprise risk" with an arithmetic mean of (3.93) and a relative weight (78.6%), and a value of (t) It reached (11.409) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000).

From the above, it is clear that all the answers of the study sample showed a general trend towards approval of the indicators of the table, and thus the acceptance of the first hypothesis that states: "The use of Cloud technology has a significant impact on the accounting and auditing profession." During the general mean of the total degree , where the general mean value (3.96 overall score out of 5), with relative weight (79.2%), which is greater than the mean relative weight of 60% and a standard deviation (0.887) and that the value of (T) test equals (12.672), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that the use of cloud technology has a significant impact on the accounting and auditing profession."

H2- *The use of big data has a significant influence on the accounting and auditing profession.*

Table 4: Statistics for big data

No	Statement	Mean	Standard deviation	%	T - Value	The probability value - Sig	Rank
01	The use of big data leads to Risk identification and management	4.12	0.888	82.4%	14.550	0.000	1
02	Provides real-time reporting through the use of big data	3.89	0.939	77.8	10.945	0.000	3
03	The use of big data leads to increased efficiency and effectiveness of accounting and auditing.	3.90	0.944	78%	10.981	0.000	2
04	Database auditing with big data analysis has revolutionized audit functions.	3.88	0.942	77.6%	10.818	0.000	4
	Total Degree	**3.94**	**0.928**	**78.8**	**11.823**	**0.000**	

According to the table 4, the mean of all the expressions of the table is greater than the fixed neutral mean value, which is represented by the number (3) between acceptance and non-acceptance, as the mean for the indicators of the table ranged between (4.12-3.88). Indicators (1) I got the first place, which states: "The use of big data leads to Risk identification and management" with an mean of (4.12) with a relative weight (82.4%), and a value of (t) It reached (14.550) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000). The last rank came to indicators (4), which states: "Database auditing with big data analysis has revolutionized audit functions." arithmetic mean of (3.88) and a relative weight (78.8%), and a value of (t) It reached (11.823) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000).

From the above, it is clear that all the answers of the study sample showed a general trend towards approval of the Indicators of the table, and thus the acceptance of the second hypothesis that states: "- The use of big data has a significant impact on the accounting and auditing profession." During the general mean of the total degree, where the general mean value (3.94 overall score out of 5), with relative weight (78%), which is greater than the mean relative weight of 60% and a standard deviation (0.928) and that the value of (T) test equals (11.823), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that the use of big data has a significant impact on the accounting and auditing profession."

H3- *The use of cloud technology has a significant influence on the accounting and auditing profession.*

Table 5: Statistics for cloud computing

No	Statement	Mean	Standard deviation	%	T - Value	The probability value Sig	Rank
01	The use of cloud computing reduces the cost of accounting and auditing.	3.99	0.827	79.8%	13.891	0.000	2
02	The use of cloud computing enhances the ability for real-time reporting.	3.90	0.944	78.0%	10.981	0.000	4
03	The use of cloud computing enhances the security of accounting information	3.93	0.903	78.6%	11.961	0.000	3
04	The use of cloud computing enhances the ability of authorized users to easily access accounting information.	4.02	0.871	80.4%	13.586	0.000	1
05	The use of cloud computing provides reliable, accurate and high-quality data for decision making.	3.93	0.939	78.6%	11.409	0.000	3
	Total Degree	**3.95**	**0.896**	**79.0%**	**12.365**	**0.000**	

According to table 5, the mean of all the expressions of the table is greater than the fixed neutral mean value, which is represented by the number (3) between acceptance and non-acceptance, as the mean for the indicators of the table ranged between (4.02-3.90). Indicators (1) I got the first place, which states: "The use of cloud computing enhances the ability of authorized users to easily access accounting information." with an mean of (4.02) with a relative weight (80.4%), and a value of (t) It reached (13.586) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000). The last rank came to indicators (2), which states: "The use of cloud computing enhances the ability for real-time reporting." arithmetic mean of (3.90) and a relative weight (78.0%), and a value of (t) It reached (10.981) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000).

From the above, it is clear that all the answers of the study sample showed a general trend towards approval of the Indicators of the table, and thus the acceptance of the third hypothesis that states: "The use of cloud technology has a significant impact on the accounting and auditing profession." During the general mean of the total degree, where the general mean value (3.95 overall score out of 5), with relative weight (79%), which is greater

than the mean relative weight of 60% and a standard deviation (0.896) and that the value of (T) test equals (12.365), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that the use of cloud technology has a significant impact on the accounting and auditing profession."

H4- *The use of robotics process automation has a significant influence on the accounting and auditing profession.*

Table 6: Statistics for robotic process automation

No	Statement	Mean	Standard deviation	%	T - Value	The probability value - Sig	Rank
01	The use of robotics reduces the cost of accounting and auditing.	3.99	0.836	79.8%	13.740	0.000	02
02	The use of robotic technology increases the accuracy of accounting and audit information.	4.12	0.888	82.4%	14.550	0.000	01
03	The use of robotics will speed up the accounting and auditing process.	3.89	0.939	77.8%	10.945	0.000	04
04	The use of robotic technology leads to increased control over the accounting and audit process and performance visibility.	3.90	0.944	78%	10.981	0.000	03
05	The use of robotic technology provides the opportunity to automate repetitive auditing tasks.	3.88	0.942	77.6%	10.818	0.000	05
	Total Degree	**3.95**	**0.909**	**79.0%**	**12.206**	**0.000**	

According to table 6, the mean of all the expressions of the table is greater than the fixed neutral mean value, which is represented by the number (3) between acceptance and non-acceptance, as the mean for the indicators of the table ranged between (4.12-3.88). Indicators (1) I got the first place, which states: "The use of robotic technology increases the accuracy of accounting and audit information." with an mean of (4.12) with a relative weight (82.4%), and a value of (t) It reached (14.550) when the value of the significant level of Sig was less than (0.05), where the

value of Sig was (0.000). The last rank came to indicators (5), which states: "The use of robotic technology provides the opportunity to automate repetitive auditing tasks." arithmetic mean of (3.88) and a relative weight (77.6%), and a value of (t) It reached (10.818) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000).

From the above, it is clear that all the answers of the study sample showed a general trend towards approval of the indicators of the table, and thus the acceptance of the fourth hypothesis that states: "The use of robotics automation has a significant impact on the accounting and auditing profession." During the general mean of the total degree, where the general mean value (3.95 overall score out of 5), with relative weight (79%), which is greater than the mean relative weight of 60% and a standard deviation (0.896) and that the value of (T) test equals (12.206), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that the use of robotics automation has a significant impact on the accounting and auditing profession."

H5- *These rapidly evolving technologies have a significant influence on the skills and competencies of accounting and auditing professionals.*

Table 7: Statistics for Professional skills and competencies

No	Statement	Mean	Standard deviation	%	T - Value	The probability value - Sig	Rank
01	Future accounting and auditing will be based on these technologies.	3.99	0.827	79.8%	13.891	0.000	1
02	Learning new technologies, methods, of techniques is important in our job.	3.90	0.944	78.0%	10.981	0.000	3
03	We need to develop our skills and competencies to face future technological advances.	3.98	0.818	79.6	13.839	0.000	2
		3.95	**0.863**	**79.0%**	**12.903**	**0.000**	

According to Table 7, the mean of all the expressions of the table is greater than the fixed neutral mean value, which is represented by the number (3) between acceptance and non-acceptance, as the mean for the indicators of the table ranged between (3.99-3.98). Indicators (1) I got the first place, which states: "Future accounting and auditing will be based on these technologies." with a mean of (3.99) with a relative weight (79.8%), and a value of (t) It reached (13.891) when the value of the significant level of Sig was less than (0.05), where the value of Sig was (0.000). The last rank came to indicators (2), which states: "2 Learning new technologies, methods, of techniques is important in our job." arithmetic mean of (3.90) and a relative weight (78%), and a value of (t) It reached (10.981) when the value of the

significant level of Sig was less than (0.05), where the value of Sig was (0.000).

From the above, it is clear that all the answers of the study sample showed a general trend towards approval of the indicators of the table, and thus the acceptance of the fifth hypothesis that states: "These rapidly evolving technologies have a significant impact on the skills and competencies of accounting and auditing professionals." During the general mean of the total degree, where the general mean value (3.95 overall score out of 5), with a relative weight (79%), which is greater than the mean relative weight of 60% and a standard deviation (0.863) and that the value of (T) test equals (12.903), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that these rapidly evolving technologies have a significant impact on the skills and competencies of accounting and auditing professionals.

Table 8: Overall Statistics

No	Statement	Mean	Standard deviation	%	T - Value	The probability value - Sig
01	Artificial Intelligence	3.96	0.887	79.2%	12.672	0.000
02	Big Data	3.94	0.928	78.8	11.823	0.000
03	Cloud Computing	3.95	0.896	79.0%	12.365	0.000
04	Robotics Process Automation	3.95	0.909	79.0%	12.206	0.000
05	Professional skills and competencies	3.95	0.863	79.0%	12.903	0.000
	Overall Degree	**3.95**	**0.896**	**79.0%**	**12.393**	**0.000**

According to above table 8, it is clear that all the answers of the study sample showed a general trend towards approval of the indicators of the table, and thus the acceptance of the main objective of the study, that states: "Industry 4.0 will improve the accounting and auditing process and have a significant impact on the accounting and auditing profession." During the general mean of the overall degree, where the general mean value (3.95 overall score out of 5), with relative weight (79%), which is greater than the mean relative weight of 60% and a standard deviation (0.896) and that the value of (T) test equals (12.393), And the value of the level of significance Sig is less than (0.05), where the value of Sig is (0.000), and the researchers attribute that to the accountants and auditors of the study sample believe that the industry 4.0 will improve the accounting and auditing process and have a significant impact on the accounting and auditing profession.

CONCLUSION AND RECOMMENDATIONS

The primary purpose of this study is to study the impact of Industry 4.0 on the accounting and auditing profession. The study is based on some of the major technological innovations in Industry 4.0. These include artificial intelligence, big data, cloud computing, and robotic automation. and also researcher studies whether accounting professionals and auditing professionals need to develop their professional skills and abilities related to these technologies. The study is based on the experience of a group of people currently in the accounting and auditing profession.

Accordingly, after several statistical experiments using the responses of the respondents, the researcher was able to draw the following conclusions.

1. The use of artificial intelligence has a significant influence on the development of accounting and auditing activities and on the accounting and auditing profession.
2. Using large amounts of data has a significant influence on the development of accounting and auditing activities and on the accounting and auditing profession.
3. Using cloud computing has a significant influence on the development of accounting and auditing activities and on the accounting and auditing profession.
4. Use of robotic process automation has a significant influence on the development of accounting and auditing activities and on the accounting and auditing profession.

Respondents have seen the results of the study show that these technologies will change the role of accountants and auditors in the future and affect the accounting and auditing profession.

This study contributes to giving businesses a broader vision of the economic establishment, enhancing their understanding of its activities, developing its strategy, gaining a highly competitive advantage for firms, minimizing costs, providing timely relevant information, and increasing information accuracy. It is revealed that many benefits such as taking can be achieved by using these technologies. Therefore, a successful accountant in the future should be aware of the opportunities and risks associated with these technologies, and analytical and information management skills are required to play the role of mediator between data analysts and senior management. It is reasonable to conclude that the use of technology in the business field has had a profound effect on the accountant. The role of accountants also changes as the business environment changes.

Recommendations

The study emphasizes the importance of continuous learning for accounting and auditing professionals to align with evolving technologies. It suggests developing technical and ethical skills such as working to defined standards with integrity and independence. Intelligence, creativity, digital proficiency, emotional intelligence, and visionary abilities are highlighted as crucial traits. Additionally, it stresses the need for prospective professionals to acquire technical knowledge, including computer skills and statistics, as technology significantly influences the field. To prepare students, educational institutions should integrate relevant technology-focused courses into accounting programs. Moreover, ongoing training for practicing accountants and efforts by government and education authorities to include these technologies in the curriculum are recommended to equip future graduates with necessary skills.

Limitation of the study

This study studies the impact of technologies in Industry 4.0 on the development of the accounting and auditing profession but

does not study the practical application of these technologies in accounting and auditing in an organization. It also does not study the adverse effects of the use of these technologies on an organization. Furthermore, there are a number of technological innovations in the context of industry 4.0, which study only a limited number of technologies, such as artificial intelligence, big data, cloud computers, and robotics.

Direction for future research

Based on the limitations of this study, prospective explorers will study the practical application of industry 4.0 technologies to organizations' accounting and auditing activities. And other technologies in Industry 4.0 that make the study of the impact on accounting and auditing more effective for future research. Future explorers can also study the readiness of Sri Lankan businesses to apply these technologies to their accounting and auditing activities. It is hoped that this will enable them to provide the guidance they need to apply these technologies more effectively to businesses in Sri Lanka. Also, it is interesting to examine the level of competency and required skills and competencies of accounting and auditing professionals on using industry 4.0 technologies.

REFERENCES

Asaad Mohammed Ali Wahhab, A. *et al.* (2020) *The Influence Of Cloud Accounting Applications* On The Accounting And Auditing Profession In Iraq-Palarch's, Journal Of Archaeology Of Egypt/Egyptology.

Association of Chartered Certified Accountants, Chartered Accountants Australia and New Zealand and KPMG (2018a) "Embracing robotic automation during the evolution of finance," p. 44.

Barbara, Lady and Ellis, P.M. (2016) The shape of things to come Big Four, technology, creative thinking and digital disruption Women's champion Good governance Keep smiling, AB Accounting and Business.

Burritt, R. and Christ, K. (2016) "Industry 4.0 and environmental accounting: a new revolution?," Asian Journal of Sustainability and Social Responsibility, 1(1), pp. 23–38. doi:10.1186/s41180-016-0007-y.

Damayanti, C.R. (2019) "Accounting and Its Challenges in the New Era," 93(AICoBPA 2018), pp. 81–83. doi:10.2991/aicobpa-18.2019.19.

Effect of Big Data on Accounting and Financial Services | purshoLOGY (2020). Available at: https://www.purshology.com/2020/02/effect-of-big-data-on-accounting-and-financial-services/ (Accessed: January 27, 2022).

El- Dalahmeh, S.M. (2021) "Impact of Big Data Analysis on Accounting Profession Field – Study in Jordanian Business Environment," International Journal of Accounting and Financial Reporting, 11(1), p. 1. doi:10.5296/ijafr.v11i1.18403.

Get ready for the fourth industrial revolution | ACCA Global (no date). Available at: https://www.accaglobal.com/lk/en/member/member/accounting-business/2016/11-12/insights/industrial-revolution.html (Accessed: January 26, 2022).

Ghani, E.K. and Muhammad, K. (2019a) "Industry 4.0: Employers' expectations of accounting graduates and its implications on teaching and learning practices," International Journal of Education and Practice, 7(1), pp. 19–29. doi:10.18488/journal.61.2019.71.19.29.

Ghani, E.K. and Muhammad, K. (2019b) "Industry 4.0: Employers' expectations of accounting graduates and its implications on teaching and learning

practices," International Journal of Education and Practice, 7(1), pp. 19–29. doi:10.18488/journal.61.2019.71.19.29.

Haton, J.P. (2006) "A brief introduction to artificial intelligence," in IFAC Proceedings Volumes (IFAC-PapersOnline). IFAC Secretariat, pp. 8–16. doi:10.3182/20060522-3-fr-2904.00003.

Ishwarappa and Anuradha, J. (2015) "A brief introduction on big data 5Vs characteristics and hadoop technology," Procedia Computer Science, 48(C), pp. 319–324. doi:10.1016/j.procs.2015.04.188.

Jędrzejka, D. (2019) "Robotic process automation and its impact on accounting," Zeszyty Teoretyczne Rachunkowości, 2019(105 (161)), pp. 137–166. doi:10.5604/01.3001.0013.6061.

Khanom, T. (2017) "Cloud Accounting: A Theoretical Overview," IOSR Journal of Business and Management, 19(06), pp. 31–38. doi:10.9790/487x-1906053138.

Kim Lien Tran, T. et al. (2019) Impact of Industrial Revolution 4.0 to the Accounting Industry in Vietnam, International Journal of Management Sciences and Business Research. Available at: http://www.ijmsbr.com.

Matt, D.T., Modrák, V. and Zsifkovits, H. (2020) Industry 4.0 for smes: Challenges, opportunities and requirements, Industry 4.0 for SMEs: Challenges, Opportunities and Requirements. Palgrave Macmillan. doi:10.1007/978-3-030-25425-4.

Moffitt, K.C., Rozario, A.M. and Vasarhelyi, M.A. (2018) "Robotic process automation for auditing," Journal of Emerging Technologies in Accounting. American Accounting Association, pp. 1–10. doi:10.2308/jeta-10589.

Moudud-Ul-Huq, S., Asaduzzaman, M. and Biswas, T. (2020) "Role of cloud computing in global accounting information systems," Bottom Line. Emerald Group Holdings Ltd., pp. 231–250. doi:10.1108/BL-01-2020-0010.

Özcan, E.Ç. and Akkaya, B. (2020) "The Effect of Industry 4.0 on Accounting in Terms of Business Management," Agile Business Leadership Methods for Industry 4.0, pp. 139–154. doi:10.1108/978-1-80043-380-920201009.

Professional accountants-the future: Drivers of change and future skills (no date). Available at: www.accaglobal.com.

Rahman, A., Rashwan, M.S. and Alhelou, E.M.S. (2020) The Impact of Using Artificial Intelligence on the Accounting and Auditing Profession in Light of the Corona Pandemic. Available at: https://oktob.io/posts.

Rosi, N.M.K. and Mahyuni, L.P. (2021) "The Future Of Accounting Profession in The Industrial Revolution 4.0: Meta-Synthesis Analysis," E-Jurnal Akuntansi, 31(4). doi:10.24843/eja.2021.v31.i04.p17.

Saunders, M.N.K., Lewis, P. and Thornhill, A. (2019) Research methods for business students.

Sekaran, U. and Wiley, J. (2003) A Skill-Building Approach Fourth Edition RESEARCH METHODS FOR BUSINESS. Available at: http://www.wiley.com/college.

Shi, Y. (2020) "The Impact of Artificial Intelligence on the Accounting Industry," in Advances in Intelligent Systems and Computing. Springer Verlag, pp. 971–978. doi:10.1007/978-3-030-15235-2_129.

Stancheva-Todorova, A. (2019) "Are Accounting Educators Ready to Embrace the Challenges of Industry 4.0,"

International Scientific Journal "Industry 4.0," 4(6), pp. 309–312.

Trochim, W.M.K. and Donnelly, J.P. (2001) "Research methods knowledge base," undefined [Preprint].

Wadan, R. et al. (2019) "Understanding the Changing Role of the Management Accountant in the Age of Industry 4.0 in Germany," Proceedings of the 52nd Hawaii International Conference on System Sciences, pp. 5817–5826. doi:10.24251/hicss.2019.702.