The Opportunities and Challenges of the New Technology Introduced in Accounting Profession

Siqi Yu(✉)

Lancaster University, Lancaster LA1 4YW, Lancashire, UK
ylzxx6688@163.com

Abstract. The process of introducing new technologies into various industries keeps building rapidly in recent years and the tendency has already spread to the accounting profession as well. The existing technologies bring the accounting profession significant changes as well as potential risks and unknown challenges at the same time. By using secondary research and a data analysis, this study focuses on the three new technologies, blockchain, cloud computing, and big data, to discuss both the strengths and weaknesses they take to the accounting industry. This paper also looks at the effect on students and workers in the accounting area after the application of new technologies and whether there are any possibilities that these new technologies can replace human. To conclude, the opportunities brought by the introduction of new technologies in the development of the accounting profession outweigh the related risks. All employees in the accounting industry should take a positive attitude to face this technology revolution.

Keywords: Technology · Accounting Profession · Blockchain · Cloud Computing · Big Data · Digitalization

1 Introduction

Nowadays, the development of digitalization makes the application of new technologies wider and closer to people's daily life than before. The technologies which are difficult for people to see in the past are now being used everywhere. These existing technologies make great differences to individuals, making their life easier. Apart from this, they also have been used in various professional industries to influence the operation of the world and bring significant changes to the progress of the world. Accounting profession is one of them. Gulin et al. show the view that the development of technology and digitalization allow updates and changes in the accounting profession, and as a cutting-edge profession, it is and will be most affected by technological developments and globalization [1]. The application of new technologies can take plenty of opportunities to improve the level of the accounting business, but still, there are some potential risks and challenges people need to notice when introducing and using these new technologies. Professors in the accounting area all hope that the new technologies are used to bring more benefits and push the development of the whole area. However, Gulin et al. also point out that the risk of automation tends to influence 702 jobs, and the accounting profession is at the

S. Kadry et al. (Eds.): BDEIM 2022, AEBMR 233, pp. 405–420, 2023.
https://doi.org/10.2991/978-94-6463-124-1_48

top of this list, which means it has a high probability of being automated and digitalized in the near future [1]. Hence, how can the accounting profession face this situation and make a good reaction to these technological changes is essential.

This paper mainly argues three new technologies, namely the blockchain, cloud computing, and big data. The author discusses how these new technologies are applied in the accounting profession and what are their advantages and disadvantages during the working process. Then the author looks at the reactions taken by the accounting students and workers to face such a technological change and gives some further advice. This paper shows a positive prospect of digitalization used in accounting profession.

2 The Application of New Technologies in Accounting Profession

2.1 Blockchain Technology

Blockchain technology is a series of encrypted data items. It contains details of the transactions that have occurred with a set of cryptocurrency coin(s) [2]. They create the whole chain by the time they are produced, and this chain is saved in all the servers. Only one server in this system can work and the whole blockchain is safe. It can record the transactions by the automated system without the participation of third parties so as to reduce the mistakes from intermediaries. Additionally, if the information in the blockchain needs to be changed, the agreements of over half of the servers must be applied for. These servers are held by different parties, so it is extremely difficult to change the information in the blockchain. These two characteristics make it safer to save information by using blockchain technology. Due to these characteristics, blockchain technology is widely used in the accounting area. According to the PricewaterhouseCoopers Global Blockchain survey, 82% of blockchain cases were used in financial services in 2017 and 46% in 2018, from which a large range of the usage of blockchain technology in the accounting and finance industry can be seen [3].

The distributed ledger is one of the core technologies of blockchain. Every server in the chain can save the whole information and they are all independent and in the equal status, so there is no one server that can record the information on its own. This can avoid others to tamper with data and make fake accounts, enabling blockchain to be used to make ledger accounts. For example, Visa company creates the Visa B2B Connect based on blockchain technology. By using distributed ledger technology, the bank-to-bank cross-border payments without a card can be achieved. It can reduce the fees from third parties and increase the speed of trading.

The exploration of blockchain in the accounting profession will make great contributions to the revolution of finance and accounting practices of healthcare, public institutions, manufacturing, energy, and financial companies in a disruptive manner [4]. Firstly, it increases security and transparency when making the transaction. Every part in the chain can easily see the whole information and no one can easily change the information, which makes the information more trusted. Additionally, it also makes the render reconciliation of accounting records with multiple business partners unnecessary [5], thus reducing the costs during transporting because it does not need the participation of third parties. In addition, the smart contracts technology in the blockchain can make some daily processes more automated. Based on some unchanged data, it can

process some orders which have already been set. This can help accounting companies to evaluate the risk and make the right decision.

Meanwhile, there are also some disadvantages when using blockchain technology in accounting profession. For instance, the data saved by blockchain technology tends to face some security threats from the Internet, such as cyberattacks. Most of such attacks are always focused on getting access to intimate information about the transactions and financial resources occupied by any firms or any individuals [4]. Thus, once important information is lost, it will cause some trouble to accounting work. Another potential problem is that blockchain technology will probably lead to financial fraud. Richins et al. mentioned this opinion in their report that fraud detection may mainly be rules-based if it is going to become fully automated [6]. This might be easier for fraudsters who recognize these rules and alter their behavior accordingly, so that fraud models fail to detect their activities [6]. Compared with human reviews, the risk of fraud is greater in automation.

2.2 Cloud Computing Technology

Cloud computing technology is described to be the hosting of computer applications and databases in a distributed way rather than having them resided on a single computer or a set of closely linked computers [2]. This technology can deal with thousands of data during a very short time, so as to achieve a stronger network. It is a big revolution in the information age after the Internet and computer. There are three main types of cloud computing: Infrastructure-as-a-Service (IaaS), Platforms-as-a-Service (PaaS), and Software-as-a-Service (SaaS).

Adjei et al. point out that some researchers describe cloud computing as an innovative and promising technology, and it not only has become a part of people's daily life but also their future development [7]. Dr. Al-zoubi states that "in companies that perform selective outsourcing, cloud users indicate higher improvement levels in their accounting processes than non-cloud users". This may make the outsourcing service providers enhance the perceived value of their services with cloud systems [8]. Financial documents are the documents that include basic and important financial data during the accounting registration, and more important data which can be processed by the cloud computing is to be included to ensure that self-service can be provided to clients. Customers can ask for the information about the products by using this system. Some researchers prove that the accounting system based on the cloud computing is totally online, so all the accounting activities can be processed online without using any documents to record [8]. The cloud computing is also used as e-accounting books to record daily operations, and by setting the access of cloud computing, it allows companies or individuals to review the accounting reports in the system [8].

One of the strengths of cloud computing is that it can save another copy to the cloud directly. Therefore, when the data is lost in the computer, it is easier to find the data back from the cloud computing. This can help reduce the trouble of finding the lost information. If the workers in an accounting company can get access to the cloud computing where all the information is saved, they can gain the data immediately wherever and whenever they need. Besides, if the customers or the third parties want to see these data, workers can share the access with them. It is very convenient. What

is more, cloud computing technology can update the data on its own on an every day, every week, or every month basis, so that workers can save their time and money to manage the data in the working process without worrying about the loss of the newest information. The biggest risk when using cloud computing is the data security of users. The lack of regulations on information access ability may cause a risk to the security of user information. Khanom indicates that 22 percent of firms delivered client tax returns by email although they know the risks to client privacy [9]. In addition, cloud computing also has a certain risk of being attacked by hackers. In 2018, Harper takes cloud computing as an example to discuss the same idea. He explains that if the workers cannot get access to the cloud computing system, they will not be able to deal with the important documents of their clients [10]. And if the cloud servers are hacked, it will lead to the miss or loss of important data.

2.3 Big Data Technology

Big Data technology is defined as the large data files that are embedded on the Internet and can often be obtained easily by users, such as the census data [2]. Big data not only contains plenty of information, but also has the ability to further process the information which makes it become more valuable. Big data has a close relationship with the cloud computing technology because it can collect various information, but it relies on the process technology of the cloud computing technology. Big data is also widely used in accounting industry today. The Institute of Chartered Accountants in England and Wales points that auditors–internal and external – have been at the forefront of accounting's use of big data [11]. Qasim and Kharbat show that auditing firms have begun to test and implement automating the audit process through the inclusion of a combination of advanced automation technologies with BDA (Business Data Analytics) and cognitive [12]. For example, PricewaterhouseCoopers uses RPA (Robotic Process Automation) technology to collect data, determine the filing status of all entities, review trial balance sheets, and convert data into tax bases [13]. This can make it easier for the preparation and revision of tax returns and tax payment submission and responses to related parties' enquiries. At the same time, Nadeem Gulzar, the Senior Development Manager at Danske Bank, said in an interview that these big data sets are like the new oil gold. And Danske Bank has used the data analysis to provide more personal service to its clients to promote the quality of service [14].

The benefits big data technology brings to the accounting profession can be shown in the following. It is convenient for accounting companies to collect the related information about their clients by using big data technology. The characteristic can make it easier to find the needed information among the large databases. This will even help accountants gain the extra information about the clients so as to make them have complete knowledge about the service. Data is the heart of accounting, and thus big data can help accountants deliver more value to businesses [11]. The huge source of the information can also help accountants gain the information from plenty of various resources, so as to help them analyse the financial problems during working from more specific ways, and then use that information to promote their work. Additionally, according to the comparison of different data, the situation of the company's operation can be realized in order to know how to avoid the risk and develop the company. However, the disadvantages of big

data also appear. If there are no regulations and requirements about these data, the data may be outdated and of low quality, making the information collection process appear some problems, for example, the data is not what the accountants need, or the data is not accurate. Big data may highlight new associations and patterns, but they may be spurious [11].

3 Case Studies of Danske Bank and KPMG

3.1 Case 1: Danske Bank

The development of digitalization and new technology brings a huge chance to the progress of service in Danske Bank. In 2013, Danske Bank published a mobile payment platform, the Mobilepay app, which was mainly used in Denmark and Finland. Then, it launched a new partnership model in 2016. After that, a strong growth was seen in the number of Mobilepay app users, increasing from around 2.8 million at the end of 2015 to around 3.3 million in 2016 (Fig. 1). The total volume of transactions also increased from DKK 20.7 billion in 2015 to DKK 44.4 billion in 2016 (Fig. 2) [15]. Then in 2017, Mobilepay became a separate entity.

From the financial statement of Danske Bank shown in Table 1, it can be easily seen that the total income and net profit of the year have kept increasing from 2014 after the launch of Mobilepay. Also, most ratios and key figures increased during this period, and the influence can be shown clearly in the year of 2016 and 2017 when a new partnership was published. These changes all indicate the progress in the bank service and that the application of new technology can pose positive effects on working.

Danske bank did not stop here. In 2019, it added Apple Pay as a new payment way to make the online payment more conveniently and safely. This approach supports Danske's digital solution strategy that makes the everyday banking easier [16]. Danske bank also changes its online financial platform to District, which can show the simple financial statement to its clients to make them realize the situation and help them make the strategies to handle everything of banking. What is more, in the last quarter of 2021, it offered a new service named Marketplace which can help customers make

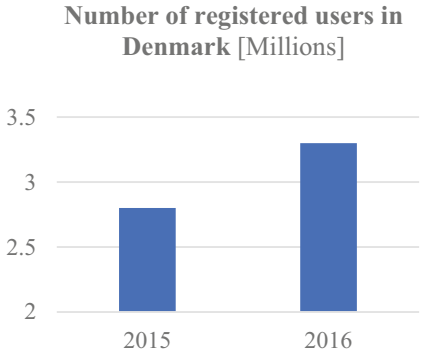

Fig. 1. Number of registered users in Denmark [15].

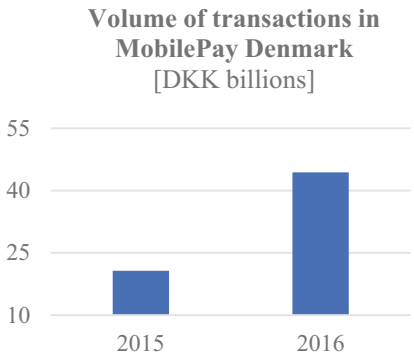

Fig. 2. Volume of transactions in MobilePay Denmark [15].

new discussions and solutions in everyday banking using a digital model. However, the change in technology application has not brought too many significant results to the company's operations and profits this time. In Table 2, it can be found that most of the company's financial indicators are in a state of fluctuation during the period from 2019 to 2021, and the performance shown by the ratios does not show a steady growth trend in operation as well. This points out that not all the applications of new technologies can make the company get a significant achievement. How to make technologies better serve working is still a difficult problem.

3.2 Case 2: Klynveld Peat Marwick Goerdeler (KPMG)

Due to the lasting influence of COVID-19, KPMG kept exploring ways to apply new technologies to its working process in 2021, in order to provide its clients with better service. According to its 2021 annual report, KPMG believes that digital tools can not only reduce the possibility of human mistakes, but also hugely speed up manual processes to make its accounting workers get more benefits for the clients rather than only focus on auditing [18]. Table 3, Fig. 3 and Table 4 indicate that, although COVID-19 has brought some influences to the working environment from 2020 to 2021, the revenue and profit of KPMG still kept increasing. In addition, the debt asset ratio from 2019 to 2020 is about 83.69%, while from 2020 to 2021, it decreases to 79.22%, which means that KPMG's solvency ability became better in 2021.

Additionally, KPMG has invested in a new area, the Quantum technology. The KPMG's Global Quantum Hub has been appointed and a new Enterprise Service Management team has been created to research more new technologies. It has also provided support to its member firms to help them evaluate relevant projects in Quantum area.

Table 1. Financial Statement of Danske Bank Group [15].

Income statement [DKK millions]	2017	2016	Index 17/16	2015	2014	2013
Net interest income	23,430	22,028	106	21,402	22,198	22,077
Net fee income	15,304	14,183	108	15,018	14,482	9,468
Net trading income	7,823	8,607	91	6,848	6,895	5,799
Other income	1,591	3,140	51	2,343	1,755	1,308
Net income from insurance business	-	-	-	-	-	1,088
Total income	48,149	47,959	100	45,611	45,330	39,740
Operating expense	22,722	22,642	100	23,237	23,972	23,794
Goodwill impairment charges	-	-	-	4,601	9,098	-
Profit before loan impairment charges	25,427	25,317	100	17,773	12,260	15,947
Loan impairment charges	−873	−3	–	57	2,788	4,111
Profit before tax, core	26,300	25,320	104	17,716	9,472	11,836
Profit before tax, non-core	−12	37	–	46	−1,503	−1,777
Profit before tax	26,288	25,357	104	17,762	7,969	10,059
Tax	5,388	5,500	98	4,639	4,020	2,944
Net profit for the year	20,900	19,858	105	13,123	3,948	7,115
Attributable to additional tier 1 etc.	786	663	119	607	261	–
Rations and key figures						
Dividend per share [DKK]	10.0	9.0		8.0	5.5	2.0
Earnings per share [DKK]	22.2	20.2		12.8	3.8	7.1
Return on avg. Shareholders' equity [%]	13.6	13.1		8.5	2.5	5.0
Return before goodwill impairment charges on avg. Shareholders' equity [%]	13.6	13.1		11.6	8.6	5.0
Return on avg. Tangible equity [%]	14.6	14.0		12.9	10.5	6.4
Net interest income as % p.a. of loans and deposits	0.89	0.86		0.88	0.95	0.95
Cost/ income ratio [%]	47.2	47.2		61.0	73.0	59.9
Cost/ income ratio before goodwill impairment charges [%]	47.2	47.2		50.9	52.9	59.9
Total capital ratio [%]	22.6	21.8		21.0	19.3	21.4
Common equity tier 1 capital ratio [%]	17.6	16.3		16.1	15.1	14.7

(*continued*)

Table 1. (*continued*)

Income statement [DKK millions]	2017	2016	Index 17/16	2015	2014	2013
Share price [end of year] [DKK]	241.6	214.2		185.2	167.4	124.4
Book value per share [DKK]	172.2	162.8		153.2	146.8	145.6
Full-time-equivalent staff [end of year]	19,768	19,303	102	19,049	18,603	19,122

Table 2. Financial Statement of Danske Bank Group [17].

Income statement [DKK millions]	2021	2020	Index 21/20	2019	2018	2017
Net interest income*	22,049	22,151	100	22,104	23,571	23,806
Net fee income*	13,525	12,217	111	12,636	15,258	15,852
Net trading income*	4,126	4,297	96	4,350	4,570	7,087
Net income from insurance business*	2,088	1,669	125	2,385	–	–
Other income*	797	594	134	1,059	966	1,403
Total income	42,584	40,928	104	42,534	44,365	48,149
Operating expenses*	25,627	26,648	96	25,545	24,991	22,722
Impairment charges on goodwill	–	–	–	803	–	–
Impairment charges, other intangible assets	36	379	9	355	20	–
Profit before loan impairment charges	16,921	13,901	122	15,831	19,354	25,427
Loan impairment charges	348	7,001	5	1,516	−650	−873
Profit before tax, core	16,573	6,900	240	14,315	20,004	26,300
Profit before tax, non-core	−2	−596	0	−493	−282	−12
Profit before tax	16,571	6,304	263	13,822	19,722	26,288
Tax	3,651	1,715	213	−1,249	4,548	5,388
Net profit	12,920	4,589	282	15,072	15,174	20,900
Attributable to additional tier 1 etc.	451	551	82	786	781	786
Rations and key figures						
Dividend per share [DKK]	2.0	2.0		8.5	8.5	10.0
Earnings per share [DKK]	14.6	4.7		16.7	16.5	22.2

(*continued*)

Table 2. (*continued*)

Income statement [DKK millions]	2021	2020	Index 21/20	2019	2018	2017
Return on avg. Shareholders' equity [%]	7.6	2.6		9.6	9.8	13.6
Net interest income as % of loans and deposits*	0.73	0.76		0.81	0.88	0.89
Cost/ income ratio [C/I], [%] *	60.3	66.0		62.8	56.4	47.2
C/I, excluding impairment on intangible assets [%] *	60.2	65.1		60.5	56.3	47.2
Total capital ratio [%]	22.4	23.0		22.7	21.3	22.6
Common equity tier 1 capital ratio [%]	17.7	18.3		17.3	17.0	17.6
Share price [end of year] [DKK]	113.0	100.7		107.8	128.9	241.6
Book value per share [DKK]	200.6	187.6		183.1	174.3	172.2
Full-time-equivalent staff [end of year]	21,754	22,376	97	22,006	20,683	19,768

* *The financial highlights represent alternative performance measures that are non-IFRS measures.*

Table 3. Financial highlights of KPMG [18].

DKK'000	2016/17	2017/18	2018/19	2019/20	2020/21
KPMG in Denmark Revenue *	575,358	697,144	829,331	1,009,737	1,111,559
Revenue KPMG P/S	**424,003**	**507,568**	**578,113**	**690,406**	**735,513**
Operating profit/loss	−993	707	−240	7,779	4,604
Profit/loss from financial income and expenses	993	−707	240	−1,585	−1,107
Profit for the year	**0**	**0**	**0**	**6,194**	**3,497**
Total assets	**239,026**	**202,208**	**266,831**	**353,201**	**304,689**
Investment in property, plant, and equipment	2,052	5,880	3,201	2,530	4,662
Equity	**560**	**627**	**49,627**	**57,594**	**55,544**
Cash flow from operating activities	−12,388	30,706	13,947	110,418	−76,086
Cash flow from investing activities	−3,363	−7,353	−3,311	−4,792	−7,424
Cash flow from financing activities	−649	−25,798	8,625	23	−3,297

(*continued*)

Table 3. (*continued*)

DKK'000	2016/17	2017/18	2018/19	2019/20	2020/21
Total cash flow	**−16,400**	**−2,446**	**19,261**	**105,649**	**−86,807**
Revenue growth **	15%	20%	14%	19%	7%
Solvency **	0%	0%	19%	16%	18%
Number of employees and partners	392	476	555	593	678
Gender split (male/female) in %	64/36	66/34	67/33	66/34	63/37

* *KPMG P/S, KPMG Acor Tax Partnerselskab & affiliates combined as KPMG in Denmark*
***The annual report of KPMG P/S for 2020/21 has been prepared in accordance with the provisions applying to reporting class C large entities under the Danish Financial Statements Act.*

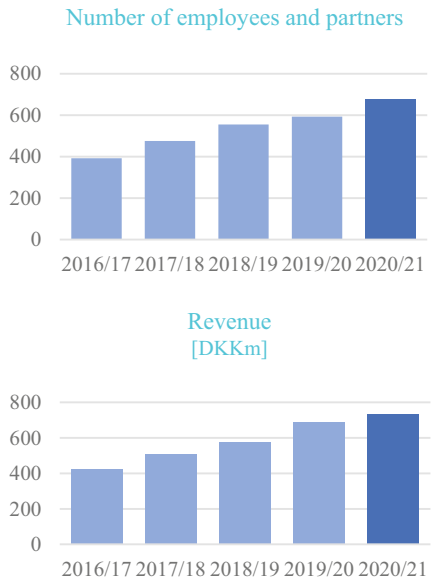

Fig. 3. Financial highlights of KPMG [18].

Table 4. Financial Statement of KPMG [18].

Income Statement			
Note	DKK'000	**2020/21**	**2019/20**
2	**Revenue**	**735,513**	**690,406**
	Other operating income	3,252	15,962
	Other external expenses	−245,600	−227,201
	Gross profit	493,165	479,167
3	Staff costs	−484,773	−466,484
5	Depreciation and amortization of goodwill, software, equipment, and leasehold improvements	−3,788	−4,904
	Operating profit	**4,604**	**7,779**
6	Financial expenses	−1,107	−1,585
7	**Profit for the year**	**3,497**	**6,194**
Balance sheet: Assets			
Note	DKK'000	**2020/21**	**2019/20**
	Non−current assets		
	Intangible assets		
5	Goodwill	1,542	0
5	Software	16	199
	Total intangible assets	**1,558**	**199**
	Property, plant, and equipment		
5	Equipment and leasehold improvements	6,026	4,725
	Total property, plant, and equipment	**6,026**	**4,725**
	Investments		
8	Participating interest	149	0
9	Deposits	16,137	15,310
	Total investments	**16,286**	**15,310**
	Total non-current assets	**23,870**	**20,234**
	Current assets		
	Receivables		
	Trade receivables	163,755	117,281
10	Services in progress	49,639	58,585
11	Other receivables	19,629	22,013
	Receivables from partners	182	97
12	Prepayments	3,335	3,905

(*continued*)

Table 4. (*continued*)

Income Statement			
		236,540	**201,881**
	Cash and cash equivalents	**44,279**	**131,086**
	Total current assets	**280,819**	**332,967**
	Total assets	**304,689**	**353,201**
Balance sheet: Equity and liabilities			
Note	DKK'000	**2020/21**	**2019/20**
	Equity		
	Contributed capital	46,082	51,400
13	Retained earnings	−10,038	−15,556
	Reserve for unpaid contributed capital	19,500	21,750
	Total equity	**55,544**	**57,594**
	Provisions		
14	Other provisions	7,762	0
	Total provisions	**7,762**	**0**
	Non-current liabilities other than provisions		
15	Other payables	0	21,220
	Total other payables	**0**	**21,220**
	Total non-current liabilities other than provisions	**0**	**21,220**
	Current liabilities other than provisions		
10	Services in progress	52,814	60,129
	Trade payables	47,271	32,895
	Other payables	141,298	181,363
		241,383	**274,387**
	Total liabilities other than provisions	**241,383**	**295,607**
	Total equity, provisions, and liabilities	**304,689**	**353,201**
16	**Contractual obligations, contingencies, etc.**		
17	**Related party disclosures**		
18	**Events after the balance sheet date**		

4 Reactions Taken in the Face of the Technology Change

The consistent development of new technologies in the accounting industry also makes some changes to the daily life of accounting workers and accounting major students. For accounting workers, the working patterns, working environments, and working processes are all different from before. Meanwhile, for accounting students, the skills related to

the accounting major are also updated. There is no doubt that these new technologies will lead to innovative development of the accounting business, however, they will also bring some new and unknown changes. To face the new changes, the whole accounting profession has already taken some steps to make this revolution process smoother.

Firstly, plenty of accounting companies start to make surveys and research about the digitalization in the accounting industry to better prepare for future challenges. For example, Klynveld Peat Marwick Goerdeler (KPMG) has already processed a study about digitalization in accounting, which aims to find out the main solutions of technologies that are applied or will be applied soon in the accounting profession [1]. What is more, Price Waterhouse Coopers (PwC) has made a survey among 76 large and

Table 5. Proposed Learning Outcomes and Assignments [12].

Course Title	Assignment	Learning Outcome
Principles of Financial Accounting	Cases, Readings, Lectures	Understand the main concepts of financial accounting and how to use AI, BT, and BDA to implement them.
Foundation of Business Technologies	Readings, Lectures, Presentations	Gain an overview of the fundamental concepts of BT, BDA, and AI and their applications in business.
Intermediate Accounting	Cases, Lectures	Gain understanding of using BT in the accounting cycle. Use XBRL in financial reporting.
Financial Statement Analysis	Cases, Lectures	Use BDA in analyzing financial statements.
Managerial Accounting	Debates, Presentations	Understand BDA techniques useful for the decision-making process. Understand the use of BT in performance measures and accountability.
Digital Accounting	Cases, Readings	Understand how BT and other technologies can improve a company's processes and operations.
Auditing	Examples from Industry	Understand analytical techniques useful for the audit engagements.
	Cases, Debates	Link audit analytics to corporate continuous monitoring and business process support. Gain an overview of contemporary applications of AI in auditing and assurance.

medium-sized companies in Germany to analyse how to combine the new technologies with different accounting working areas, so as to come up with plans about new technology applications [1].

Furthermore, some accounting institutions also tend to set up a series of regulations and principles to give standards for using new technologies. Gardner points out that the regulators are not only considering how to make the use of technology more normative, so that the data can be processed ethically and transparently to bring benefits to customers, but also striving to find a way where financial services regulation can react to the new technological developments while not stopping innovation [19].

Additionally, some accounting professors advise a combination of the new technologies with college curricula, so that accounting students are able to learn related knowledge about these new technologies in their universities. This can make them get more familiar with these techniques before working. Qasim and Kharbat also agree to introduce such knowledge to accounting courses, and they give a recommendation of the course sequence which can be seen in Table 5. At the same time, they point out that these sample technologies used in the courses rely on the current literature and the available technology. If a new technology appears in the future, it can be easy to add it into the courses or replace the old one [12].

5 Attitude to the New Technology

According to the discussion before, it is not difficult to notice that the advantages of applying new technology in the accounting profession overweighs the disadvantages it brings. In other words, the application of new technology is a positive action for the accounting industry. It is certain that the usage of the technology will reduce the number of employees working in the accounting profession, but humans will not be totally replaced by the technology. Though the blockchain technology is easy to use, it is too rigid. There is still a need for accountants to review the process. In addition, there are still some parts that are difficult to automate in the accounting business by the technology, for instance, auditing may require humans for reviewing so as to avoid the appearance of financial fraud. This activity requires a deep knowledge of the business environment and related people as well as the flexibility with various fraud situations. All of these are hard for technology to achieve. It is undeniable that the occupation of the accounting profession will reduce and the requirements of the workers in the accounting profession will become stricter. The fields such as book-keeping and process-driven auditing will be subject to greater degrees of automation [20]. Therefore, accountants still need to learn how to use new technologies to promote themselves and face upcoming challenges.

6 Conclusion

To conclude, revolution is the main opportunity brought by the new technology in the accounting business, such as blockchain, cloud computing, and big data. The application of the new technology changes the work patterns of some accounting practices. It also simplifies workflows, encourages a transformation for the talents in the accounting industry, and improves efficiency and productivity. As a result, accountants can

have more time to enhance their occupational technology and literacy. What is more, it creates a chance to simplify the service process of the accounting industry to provide customers with a new and better service experience. Although the new technology also brings risks like Internet attacks and financial fraud, compared to the risks, these new technologies bring much more positive changes to the accounting industry. In addition, various positive reactions of the industry can be observed from the research undertaken by accounting companies and the regulations made by the whole accounting profession, as well as the preparation done for the courses of accounting students in universities. These all show that the accounting profession has a firm attitude to face the challenges of new technology and an unknown future. New technology is a double-edged sword in the development of the accounting profession. What people need is to focus on its good side, and prevent the bad effect, so as to make the new technology become an opportunity for the new age.

References

1. Gulin, D., Hladika, M. and Valenta, I. (2019) 'Digitalization and the Challenges for the Accounting Profession ', ENTRENOVA - Enterprise Research Innovation, 5(1), pp. 428–437. Available at: https://hrcak.srce.hr/file/365065 [Accessed: 9 August 2022].
2. Ince, D. (2019) A Dictionary of the Internet. 4th edn. Available at: https://www.oxfordreference.com/view/https://doi.org/10.1093/acref/9780191884276.001.0001/acref-9780191884276 [Accessed: 9 August 2022].
3. PwC Global Blockchain survey (2018). 'Blockchain is here. What's your next move? ' www.pwccn.com/global -blockchain-survey-2018 [Accessed: 7 August 2022].
4. Demirkan, S., Demirkan, I. and Mckee, A. (2020) 'Blockchain technology in the future of business cyber security and accounting ', Journal of Management Analytics, 7(2), pp. 189-208.doi: https://doi.org/https://doi.org/10.1080/23270012.2020.1731721.
5. Sinha, S. (2020) 'Blockchain—Opportunities and challenges for accounting professionals', The Journal of Corporate Accounting & Finance, 31, pp. 65-67.doi: https://doi.org/https://doi.org/10.1002/jcaf.22430.
6. Richins, G., Stapleton, A., Stratopoulos, T. and Wong, C. (2017) Big Data Analytics: Opportunity or Threat for the Accounting Profession', Journal of Information Systems, 31(3), pp. 63-79.doi: https://doi.org/https://doi.org/10.2308/isys-51805.
7. Adjei, J., Adams, S. and Mamattah, L. (2021) 'Cloud computing adoption in Ghana; accounting for institutional factors', Technology in Society, 65, pp.1-9. doi: https://doi.org/https://doi.org/10.1016/j.techsoc.2021.101583.
8. Al-zoubi, A. (2017) 'The Effect of Cloud Computing on Elements of Accounting Information System', Global Journal of Management and Business Research, 17(3), pp.1–8. Available at: https://www.researchgate.net/profile/Abdullah-Al-Zoubi/publication/341056836_The_Effect_of_Cloud_Computing_on_Elements_of_Accounting_Information_System/links/5eab46ad45851592d6ae5eaf/The-Effect-of-Cloud-Computing-on-Elements-of-Accounting-Information-System.pdf [Accessed: 20 August 2022].
9. Khanom, T. (2017) 'Cloud Accounting: A Theoretical Overview', Journal of Business and Management, 19(6), pp. 31-38.doi: https://doi.org/https://doi.org/10.9790/487X-1906053138.
10. Harper, A. (2018) 'Technology is the future for accountants, but not without risk ', Accountancy Age. 14th June. Available at: https://www.accountancyage.com/2018/06/14/technology-is-the-future-for-accountants-but-not-without-risk/ [Accessed: 7 August 2022].

11. ICAEW (2019). 'Big data and analytics: the impact on the accountancy profession'. https://www.icaew.com/-/media/corporate/files/technical/technology/thought-leadership/big-data-and-analytics.ashx [Accessed: 7 August 2022].
12. Qasim, A. and Kharbat, F. (2019) 'Blockchain Technology, Business Data Analytics, and Artificial Intelligence: Use in the Accounting Profession and Ideas for Inclusion into the Accounting Curriculum ', Journal of Emerging Technologies in Accounting, 17(1), pp. 107-117.doi: https://doi.org/https://doi.org/10.2308/jeta-52649.
13. Zhang, Y., Xiong, F., Xie, Y., Fan, X. and Gu, H. (2020) 'The Impact of Artificial Intelligence and Blockchain on the Accounting Profession ', IEEE Access, 8, pp. 110461-110477.doi: https://doi.org/https://doi.org/10.1109/ACCESS.2020.3000505.
14. Huttunen, J., Jauhiainen, J., Lehti, L. and Nylund, A. (2019) 'Big data, Cloud Computing and Data Science applications in finance and accounting', ACRN Journal of Finance and Risk Perspectives, 8, pp.16–30. Available at: http://www.acrn-journals.eu/resources/SI08_2019b.pdf [Accessed: 20 August 2022].
15. Danske Bank Group (2017) Annual Report 2017. Available at: https://danskebank.com/-/media/danske-bank-com/file-cloud/2018/2/annual-report-2017.pdf [Accessed: 13 September 2022].
16. Danske Bank Group (2019) Annual Report 2019. Available at: https://danskebank.com/-/media/danske-bank-com/file-cloud/2020/2/annual-report-2019.pdf?rev=ce58f68c871c451ab82c07640edbc51f&hash=091E45286122B94B1F719CEA4F23A799 [Accessed: 13 September 2022].
17. Danske Bank Group (2021) Annual Report 2021. Available at: https://danskebank.com/-/media/danske-bank-com/file-cloud/2022/2/danske-bank-annual-report-2021.pdf?rev=69dbc04901ab4b69ab246ba6bb26448b&hash=4A19C616EED649A97CB65D5242B64F98 [Accessed: 13 September 2022].
18. KPMG (2021) KPMG P/S Annual Report: Together for better. Available at: https://assets.kpmg/content/dam/kpmg/dk/pdf/dk-2022/dk-KPMG-annual-report-2021.pdf [Accessed: 12 September 2022].
19. Gardner, M. (2020) The Impact of Technology on the Accountancy Profession: Risks and Opportunities. Available at: https://www.icas.com/__data/assets/pdf_file/0009/555849/The-Impact-of-Technology-on-the-profession.pdf [Accessed: 7 August 2022].
20. Galarza, M (2017). 'The changing nature of accounting', Strategic Finance, 98(8), pp.50–54. Available at: https://www.proquest.com/docview/1899388457/fulltext/7991C9E47B694827PQ/1?accountid=11979 [Accessed: 10 August 2022].