Implications of Digitalization of Accounting for the Development of the Accounting Curriculum

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ABSTRACT

The rapid increase in digitalization of accounting has changed the business landscape calling for more innovative solutions. At the practitioner level, the use of fintech is a necessity, while at the academic level, fintech has not yet been fully implemented in the learning process. Accounting education must follow the circumstances to be able to produce quality output and be able to compete in the world of work. The aim of this research is to discuss the extent to which accounting digitalization has occurred, what areas are affected by accounting digitalization, the opportunities that arise as a result of accounting digitalization, the readiness of prospective accountants to face accounting digitalization, what changes need to be made to the accounting education curriculum. The method used in research is a qualitative method with the aim of explaining phenomena, attitudes, dynamics that show the actual situation. The data collection process in this research takes the form of observation, interviews, documentation and literature reviews from various written sources related to accounting digitalization. The findings of this research are that there are changes that need to be made by accounting at this time to include artificial intelligence technology such as AI, cloud systems, IoT, into the academic learning process, thereby improving workforce skills in their field when combined with the use of technology. Automation in accounting can reduce the share of work for accounting graduates, causing the demand for workers to decrease, even for technical matters with the help of applications. Digitalization of accounting using cloud computing systems makes it easier for financial decision makers.

INTRODUCTION

Industries operating in the service and financial sectors have shifted from manual reporting towards computerization and fintech. This resulted in a significant reduction in the workforce in the services and financial sectors. The rapid increase in digitalization of accounting has changed the business landscape calling for more innovative solutions. Recent trends in the use of technology require financial and banking institutions to increase investment in digital services, review service distribution channels, especially business-to-consumer models, further increase the standardization of back-office functions, etc. (Românova & Kudinska, 2016). Some members of the financial services industry see the explosion of digital finance as a threat to the industry. Digital finance has become a challenge that can be turned into an opportunity as it provides more flexibility, better functionality in some areas, and aggregation of services (Românova & Kudinska, 2016). At the practitioner level, the
use of fintech is a necessity, this is in contrast to the academic level which has not yet fully implemented fintech in the learning process. Several studies have revealed that as global economic growth continues to increase, it requires the performance of an accountant to be more productive, therefore accounting education must develop according to circumstances to be able to produce quality output and be able to compete in the world of work (Hussein, 2017). This is an important step to make the accounting profession survive amidst the threat of technology that can replace the role of humans (Ghani & Muhammad, 2019). Apart from that, revitalizing the accounting education curriculum in the form of improving skills must be equivalent to accounting consultants and maximizing the use of technology in accounting education (Ardiansyah, 2021). Technological disruption of accounting is still partial so that the parts affected by accounting are still general (Pitria & Mahyuni, 2022).

In practice, several universities with accounting majors in West Nusa Tenggara have not implemented financial technology in their curriculum (Ardiansyah, 2021). The readiness of prospective accounting staff in understanding digital financial technology and the knowledge of prospective accounting staff in operating it are certainly questionable. Therefore, there is an urgency to map the extent to which accountants’ work has been and will be disrupted by the presence of the application of advanced technology in the accounting field; which areas of tasks will be completely replaced; and what adjustments the accounting profession needs to make to remain relevant. Therefore, this research tries to examine the implications of accounting digitalization for accounting practitioners and especially prospective accountants in facing the wave of technology that demands major changes in the world of industry and education (Al Ghatrifi, Al Amairi, & Thottoli, 2023). The readiness of prospective accountants seen from their operational knowledge and understanding of accounting digitalization and maximizing accounting digitalization at the academic level is an issue that must be immediately followed up by accounting stakeholders. This research discusses the extent to which accounting digitalization has occurred, what fields are affected by accounting digitalization, the opportunities that arise as a result of accounting digitalization, the readiness of prospective accountants to face accounting digitalization, what changes need to be made at the level of accounting education. Based on this, researchers feel the need to conduct research related to the implications of accounting digitalization for the development of the accounting curriculum.

**METHOD**

The method used in research is a qualitative method with the aim of explaining phenomena, attitudes, dynamics that show the actual situation by prioritizing a process of in-depth interaction between the researcher and the phenomenon (Chariri, 2009). The data collection process in this research took the form of observations, interviews, documentation from accounting stakeholders and literature reviews from various written sources related to accounting digitalization. Observation and interviews are the main data collection techniques (measuring tools), because they have high reliability and validity and are able to capture verbal and nonverbal data about the aspects studied (Bachri, 2013). Data collection was carried out by conducting observations, interviews and documentation with informants consisting of accounting stakeholders. The data obtained was then tested for validity and validity using data triangulation techniques.

A systematic literature review was carried out to determine changes as a result of the digitalization of accounting by searching various articles related to accounting developments. The search was carried out on Google Scholar and only covered accounting developments in Indonesia. There are several keywords used for the literature review of this research, namely accounting digitalization, accounting applications, financial technology, database-based accounting, industrial era accounting developments, technology in accounting education, accountants in the digitalization era, industrial era accounting curriculum. The research vulnerabilities studied in the research were from 2018-2019 or were only studied from research in the last five years. This literature review contains reviews and
researchers’ perceptions of the phenomena that occur in the digitalization of accounting in the current era. This literature review aims to provide information to readers about the results of previous research which are closely related to this research. This information is conveyed by connecting research with existing literature, as well as filling gaps in previous research (Wirapraja & Aribowo, 2018). An interpretive approach is used to determine the perspective of the informants studied and the literature review studied is a form of collaborative approach seen from the subjectivity of the informants and previous research utilizes the competence of both to understand the problems in more depth (Bradbury-Jones, 2014). How both view reality in a holistic, interconnected, complex and reciprocal manner between the two (Rahardjo, 2018).

RESULT AND DISCUSSION

At this stage the researcher carries out direct interpretation of the findings obtained during observations and interviews. Researchers separate the data and then interpret it one by one. Based on the results of observations in this research, it was found that digitalization of accounting has reached the cloud and big data stage in input for financial reports, AI assistance, Internet of things and chatGPT for making financial reports and auditing financial reports, and the discussion is currently being hotly discussed by accountants such as fintech, Peer to peer landing, and crowdfunding. Apart from that, areas of accounting that are affected by digitalization of accounting include the preparation of financial reports, auditing financial reports, taxation, several parts of banking, and accounting information systems. However, apart from several sections that are affected by accounting digitization, there are new sections that have emerged as a result of digitalization, such as data scientists for accounting, accounting cloud engineers, accounting database administrators, and others. The emergence of various new job opportunities as a result of digitalization of accounting forces accountants to always adapt to technological developments. The readiness of accountants is of course questionable because with technological developments the work of accountants has shifted from technical work such as preparing financial reports to specialized work such as financial report analysis. Therefore, accountants must always be ready to face technological developments that are increasingly disrupting accountants’ work. The readiness of accountants to face the wave of technology needs to be studied at the university level, so that the process from input to output produced can compete with industrial developments. Accounting education as a pioneer of accountants must adapt to technological developments. Based on observations that have been made, changes that need to be made for the development of accounting education include, among other things, the accounting curriculum is adjusted to technological developments, such as adding courses that link technology with accounting, data analysis and accounting science, IoT and cloud engineering in accounting.

In practice, digitalization of accounting has reached the stage of automation of technical matters such as the preparation of financial reports, this of course has an impact on reducing the technical accounting workforce. As stated by the informant as an academic.

“If we talk about the extent of digitalization in accounting in the current era, digitalization has come to the automation of technical work. Automation in accounting can reduce the work portion of accounting graduates, the reduced work portion causes less demand for workers, even for technical matters with the help of applications”.

The automation brought about by the digitization of accounting presents various advantages in its use. The same thing was also expressed by informants who were practitioners.

“The digitalization of accounting using a cloud computing system has been launched by financial experts, this makes it easier for decision makers and to observe accounting information systems. Because with cloud computing accounting data is processed faster, more economically, flexibly, efficiently and with less fraud”.

The disruption of accounting digitalization which promises convenience for users can threaten the technical work of accountants. Work such as creating financial reports, sales data, purchasing data, financial projections can be replaced by cloud computing, IoT, ChatGPT, AI. As stated by the informant who is an accounting academic.

“If we talk about what areas in accounting can be replaced by technology. Almost all technical fields can be replaced by technology such as report book making, data entry,
bank reconciliation, debt verification, payroll systems, tax handling, even audits. So at that time only specialists in the field of accounting could survive, such as auditors, business consultants, financial consultants, tax consultants and the like”.

The increasing level of automation causes the role of human workers in the technical field of accounting to decrease and results in a reduction in the workforce in the field of accounting. This is also supported by statements from informants who are practitioners.

“In the corporate governance system which refers to increasing profits, budget effectiveness and efficiency, sufficient effort is made to use machines/technology so that the company’s efficiency and effectiveness in distributing products is achieved. In the financial sector, the company encourages automation of technical matters to support urgent (sudden) decision making, of course reducing the number of workers but from the other side the quality/qualification of the workforce received is also at a higher level tall”.

Job qualifications at a higher level were also explained by Syaiful Ali, M.I.S., Ph.D., Lecturer at the Accounting Department, FEB UGM and the Professional Accountant Certification Board.

“The role of accountants in this case can contribute to the preparation of strategic responses. Accountants who understand the latest technological developments and help companies build strategic responses. In the area of value creation, accountants can use Big Data, Data Analytics to build a more Agile organization. Apart from that, accountants can also play a role in structural changes, helping organizations take advantage of the latest technology”.

The changing work qualifications of accountants as a result of digitalization of accounting have given rise to new employment areas, this has become new opportunities and stakeholders must be responsive to these developments. As stated by the informant who is an academic.

“Technological developments not only reduce the work of accountants but also create new jobs, these new jobs lead to technological developments for accounting. Accounting stakeholders must be responsive to technological developments, especially the field of accounting education which plays the most role in this formation, therefore the adoption of technology for accounting needs to be implemented into the accounting curriculum and learning”.

The adoption of accounting technology has been carried out by many companies in Indonesia, this gives a signal to accounting education in Indonesia to innovate to develop the accounting learning process. As stated by the informant who is an accounting practitioner.

“The use of technology in companies has a significant impact on the efficiency and effectiveness of company operations, the workforce that previously worked on ledgers, balance sheets, adjustments and several things related to accounting bookkeeping is starting to decrease. The level of employee recruitment for administration and finance is becoming higher at the level of financial analyst, accounting computer specialist, accounting application specialist, accounting data analyst and others. There are still many accounting graduates, especially those who have just graduated, who haven’t studied it in depth and it tends to be foreign to them when discussing the use of accounting technology and this is homework for universities”.

Based on interviews conducted with accounting practitioners, quite a number of accounting graduates do not understand the use of accounting technology, indicating that prospective accountants are not ready to use technology for accounting. This is also supported by the statement of the informant who is an academic.

“If we talk about the readiness of prospective accountants who are accounting students, this cannot be separated from the facilities that students receive during their studies. If supporting facilities such as computers and internet access are adequate, there is no reason not to be ready. If the supporting facilities are inadequate, students cannot talk much about the use of technology for accounting. Apart from that, the learning system
must adapt to developments, for example the use of AI to make financial reports, but students must also understand how to make financial reports manually”.

The disruption of accounting digitalization has occurred and it is not a choice for prospective accountants whether they are ready or not. As stated by informants who are practitioners.

“Technological development is a definite thing and it is not a choice to be ready or not ready, so for companies mastering technology is a must. Access to technology nowadays is also very easy and it is not difficult for accounting graduates to develop themselves, they just have to adapt by looking at what skills are needed to work in one place and the key remains with themselves”.

The readiness of prospective accountants is an output from the implementation of accounting education. The academic sector plays an important role in forming prospective accountants who are adaptive to technological developments. As stated by the informant who is an academic.

“In the formation accounting learning process, several things that have recently received attention are the role of AI (artificial intelligence) in accounting. For accountants to exist in their field, accountants must be able to master AI and other financial technologies. AI and financial technology can be included in the accounting curriculum, but must be supported by adequate facilities from the university, so that it can produce output that does not only focus on bookkeeping but can take a greater role in decision making for stakeholders.”.

The increasing needs of technology companies in several fields require the field of formal education to adapt, but in reality formal education is always late in responding to technological developments compared to practitioners. Therefore, action is needed to address this with a technology-based accounting education curriculum revolution. As stated by the informant who is an academic.

“If we talk about the application of technology during the academic process, we cannot deny that there are many factors that influence it to be difficult or slow to happen. For example, uneven facilities, teaching staff who are still adapting to technological developments, teaching staff's understanding of information technology, cloud computing, IOT (internet of things), chatGPT and others is still limited”.

Similar things were also expressed by other informants who were academics too.

“We in the academic realm are always behind people in the working world in terms of applying technology. Therefore, one thing that can be done to overcome this gap is to invite them as lecturers to provide provisions to students and provide an overview of how technology plays a role in the world of work. Apart from that, curriculum changes really need to be made because technological developments are increasingly dominating technical jobs so that when students are in the world of work they are ready to compete with globalization”.

The role of practitioners in developing an accounting education curriculum based on AI (artificial intelligence), cloud computing, IoT (internet of things) is very much needed, this is to overcome the problem of accounting education curriculum needs regarding the use of artificial intelligence. As expressed by informants from among practitioners regarding the changes that need to be made by accounting education.

“The changes that accounting needs to make at this time include artificial intelligence technology such as AI, cloud systems, IoT, into their learning process. We, as labor suppliers, are very open to sharing experiences related to technology development for academic purposes, so we hope that our workforce will become more skilled in their field when combined with the use of technology”.

Based on the discussion of the results of interviews with academics and practitioners, data collection triangulation was then carried out by comparing the information obtained through three data collection techniques, namely observation, interviews and documentation. Several processes are carried out to triangulate data as follows:

1. Collect data / reports
2. Make observations from individual data sets
3. Note trends across data sets
4. Identify additional data to be captured
5. Summarize the findings and draw conclusions

Based on the data identification and triangulation that has been carried out, there are several findings during this research, including the following:

Automation in accounting can reduce the work portion of accounting graduates, the reduced work portion causes the demand for workers to be less, even for technical matters with the help of applications. This is supported by the following research which states that accountants account for 95 percent of job losses because machines take over the role of analyzing data and numbers. However, this same report found that as technology advances some jobs are eliminated (Triatmaja, 2019).

The digitalization of accounting using a cloud computing system has been launched by financial experts, this makes it easier for decision makers and to observe accounting information systems. Because with cloud computing accounting data is processed faster, more economically, flexibly, efficiently and with less fraud. This supports the statement from the following research which states that Cloud computing is developing very rapidly in this era, for example Indonesia is one of the major instruments involved in it. Cloud computing makes the internet a processing center for managing user data. Cloud service providers make it easy for users to log into the internet to run applications (Pitria & Mahyuni, 2022).

Technical areas of accounting can be replaced by technology such as report book making, data entry, bank reconciliation, debt verification, payroll systems, tax handling, even audits. So at that time only specialists in the field of accounting could survive, such as auditors, business consultants, financial consultants, tax consultants and the like. This research supports and develops previous research which states that areas of accounting are being replaced by systems such as journaling, calculating accounts receivable, inventory calculations, and preparing financial reports. (Saputri & Fauziyyah, 2023).

In the corporate governance system which refers to increasing profits, effectiveness and efficiency of the budget, adequate efforts are made to use machines/technology so that the company’s efficiency and effectiveness in distributing products is achieved. In the financial sector, the company encourages automation of technical matters to support urgent (sudden) decision making, of course reducing the number of workers but from the other side the quality/qualification of the workforce received is also at a higher level tall. This research supports statements from previous research which states that the functionality, ease of use and suitability of technology that embraces accounting information systems has an influence on the quality of accounting information systems (reliability, timeliness, flexibility, usability and sophistication) and has an impact on the quality of accounting information (relevance, accuracy, and completeness) (Wisna, 2013).

The changing work qualifications of accountants as a result of the digitalization of accounting have given rise to new employment areas, this has become new opportunities and stakeholders must be responsive to these developments. Supports the statement from previous research which states that trends in the accounting profession continue to change over time. In the current industrial era 4.0, accountants and prospective accountants are required to be able to adapt to various dynamic changes to maintain the existence of their role so that it remains relevant and maintains a competitive advantage in the world of work (Prakosa & Firmansyah, 2022).

The use of technology in companies has a significant impact on the efficiency and effectiveness of company operations, the workforce that previously worked on ledgers, balance sheets, adjustments and several things related to accounting bookkeeping is starting to decrease. The level of employee recruitment for administration and finance is becoming higher at the level of financial analyst,
accounting computer specialist, accounting application specialist, accounting data analyst and others. The results of this study support statements from previous research that stated the increased use of automation means that accountants spend less time on manual tasks such as data entry and more time on meaningful analysis. Previous industrial revolutions had expanded the role of accountants not only to recording and reporting processes but also to analyzing information for economic decision making by management (Noviari, Visar Sinatrya, Daru Ramdhani, Ramadhan, & Muhammad Rasid Safari, 2022).

If the supporting facilities are inadequate, students cannot talk much about the use of technology for accounting. Apart from that, the learning system must adapt to developments, for example the use of AI to make financial reports, but students must also understand how to make financial reports manually. The results of this research support the statement from previous research which states that the development of learning media is often accompanied by technological developments which also influence changes in the learning patterns of generations at that time. Teachers/lecturers can utilize various technological media or other platforms so that students can understand the learning process according to their characteristics (Mukmin & Aziz, 2023).

In the accounting learning process that takes place, several things that have recently received attention are the role of AI (artificial intelligence) in accounting. For accountants to exist in their field, accountants must be able to master AI and other financial technologies. AI and financial technology can be included in the accounting curriculum but must be supported by adequate facilities from the university, so that it can produce output that does not only focus on bookkeeping but can take a greater role in decision making for stakeholders. This supports the statement from previous research which states that accounting is an important instrument for realizing accountability, for this reason, under various conditions, accounting and the accounting profession should not be left behind or abandoned. Accounting science and the accounting profession must develop and adapt to changes in the environment, have a vision for the future - predictive, so that it provides benefits and remains up-to-date and relevant, but must also be connected to the world (Mardiasmo, 2018).

Factors that make it difficult to apply accounting technology in a university environment include uneven facilities, teaching staff who are still adapting to technological developments, teaching staff's understanding of information technology, cloud computing, IOT (internet of things), chatGPT and others still limited. This supports the statement from previous research which states that accounting education is currently seen as insufficient to equip students with skills to face competitive life in the real world. (Howcroft, 2017).

The academic world is always behind people in the working world in terms of applying technology. Therefore, one thing that can be done to overcome this gap is to invite practitioners as lecturers to provide provisions to students and provide an overview of how technology plays a role in the world of work. Apart from that, curriculum changes really need to be made because technological developments are increasingly dominating technical jobs so that when students are in the world of work they are ready to compete with globalization. This supports the statement from previous research which states that each course can internalize IT issues and the latest developments in the learning process. Team teaching is carried out by increasing the composition of practitioners as teachers, bringing in guest lecturers and experts, seminars and workshops to improve student expertise and skills by creating a supportive academic atmosphere (Ardiansyah, 2021).

Changes that need to be made by accounting at this time include artificial intelligence technology such as AI, cloud systems, IoT, into the academic learning process. Practitioners as labor suppliers are very open to sharing experiences related to developing technology for academic purposes, so that practitioners expect the workforce to become more skilled in their field when combined with the use of technology. This supports statements from previous research which states that intelligent systems
are taking over more and more decision-making tasks from humans. While accountants have used technology for years to improve what they do and provide more value to businesses, it is an opportunity to reimagine and radically improve the quality of business and investment decisions that is the ultimate goal of the accounting profession (Triatmaja, 2019).

CONCLUSION

Based on the results and discussion, the following conclusions can be drawn, automation in accounting can reduce the work portion of accounting graduates, the reduced work portion causes the demand for workers to be less, even for technical matters with the help of applications. Digitalization of accounting utilizing cloud computing systems makes it easier for decision makers and to observe accounting information systems. Fields of accounting that are technical in nature can be replaced by technology such as report book making, data entry, bank reconciliation, debt verification, payroll systems, tax handling, and even audits. So at that time only specialists in the field of accounting could survive, such as auditors, business consultants, financial consultants, tax consultants and the like. Enough effort is made to use machines/technology so that the company's efficiency and effectiveness in distributing products is achieved. The level of employee recruitment for administration and finance is becoming higher at the level of financial analyst, accounting computer specialist, accounting application specialist, accounting data analyst and others. The learning system must adapt to developments, for example the use of AI to make financial reports, but students must also understand how to make financial reports manually. AI and financial technology can be included in the accounting curriculum but must be supported by adequate facilities from the university, so that it can produce output that does not only focus on bookkeeping but can take a greater role in decision making for stakeholders. Factors that make it difficult to apply accounting technology in a university environment include uneven facilities, teaching staff who are still adapting to technological developments, teaching staff's understanding of information technology, cloud computing, IOT (internet of things), chatGPT and others is still limited. The realm of academics is always behind people in the world of work in terms of applying technology. One thing that can be done to overcome this gap is by inviting practitioners as lecturers to provide provisions to students and provide an overview of how technology plays a role in the world of work. Changes that need to be made by accounting at this time include artificial intelligence technology such as AI, cloud systems, IoT, into the academic learning process. Practitioners as labor suppliers are very open to sharing experiences related to technology development for academic purposes, so that practitioners expect the workforce to become more skilled in their field when combined with the use of technology.

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