

Analysis of the Accounting Learning Digital Disruptive in Industrial Revolution 4.0 and Society 5.0

Melinda Malau

Accounting Department, Faculty of Economics and Business
Universitas Kristen Indonesia
melinda.malau@uki.ac.id

ABSTRACT

The Industrial Revolution 4.0 is a fundamental work processes and change in the way of human life. The advancement of information technology integrates the world with digital which can have an impact on scientific disciplines. The emergence of the Industrial Revolution 4.0 made a new face in the phase of technological progress. The study of accounting learning in the era of the Industrial Revolution 4.0 was carried out. There is a variety of very fast transformations in design, operation, manufacturing, and production systems that cause digital disruptive. The existence of disruptive and degradation of human role then makes a change as Society 5.0, a human-centered society developed by Japan. Thus, the purpose of this study is to evaluate the things that have and need to be done in accounting learning in the context of Society 5.0. The study was conducted with descriptive, analytic and qualitative methods which were supplemented by literature studies and observations of the evolution of accounting learning. This study concludes that some have anticipated accounting learning in Society 5.0, but there are still many opportunities for improvement.

Keywords: *society 5.0, industrial revolution 4.0, accounting, learning, digital disruptive*

1. INTRODUCTION

The existence of technological changes that are very fast have an impact on the development of accounting learning. The Industrial Revolution Era 4.0 is known as a change in the way work is focused on data management, industrial work systems through technological advances, communications and work efficiency improvements related to human interaction. Data becomes the main requirement of the organization in the corporate decision-making process that is supported by computing and unlimited data storage systems (World Economic Forum, 2016)

Therefore, an educator is required to be able to upgrade themselves optimally and independently and utilize existing technology to improve the quality of education in Indonesia (Martani, 2018).

Achieving effective learning and in accordance with the expected goals, a thematic study is needed which is a combination of the tertiary environment and the real world of work (Aoun, 2017). Through this concept, it is hoped that artificial intelligence will transform big data

collected through the internet in all areas of life into a new wisdom. The hope is to increase the ability of humans to open up opportunities for humans (Mayasari, 2019).

The problems that arise are as follows: (1) How to map the strategic learning of accounting in the Industrial Revolution 4.0 and Society 5.0? (2) What is the revision of the accounting curriculum in higher education institutions that is more responsive to the Industrial Revolution 4.0 and Society 5.0? (3) What is the analysis of learning, challenges and opportunities related to Society 5.0 in Higher Education?

2. LITERATURE REVIEW

Learning is a process in a person to achieve certain goals and behavior change is the result of learning or learning is a process of learning and learning outcomes (Gulo, 2002).

Learning is defined as a change towards development for the better. Internal factors originating from within the individual and external factors that come

from outside the individual will influence the success of students in learning activities. Internal factors are physiological and psychological factors. Meanwhile, external factors are environmental conditions around students both social and non-social (Suryabrata, 2010).

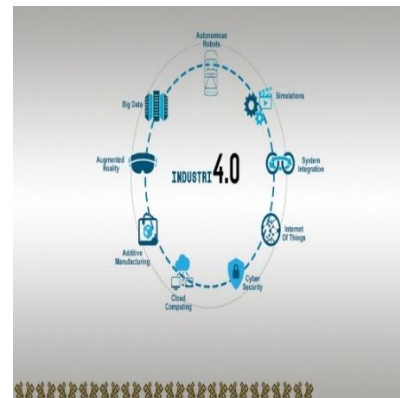
For this reason, education needs to change and guide Indonesia towards the industrial revolution 4.0. (Jalal, 2018).

The digital era is a period where all humans can communicate with each other so close despite being far apart. We can quickly find out certain information even in real time. Globalization is a process of international integration that occurs due to the exchange of world views, products, thoughts, and other aspects of culture caused by the advancement of telecommunications, transportation and internet infrastructure. In this era, industrial manufacturing activities were integrated through wireless technology and big data which were carried out on a massive scale (Burrit, 2016).

Disruptive innovation is innovation that helps create new markets, disrupt or damage existing markets, and ultimately replace the previous technology (Deloitte, 2017). Technology is undergoing a revolution that affects the way people live, work, and interact (Rukmini, 2018). Disruptive innovation spurs executives to be able to determine funding and purchases in a company (Christensen, 1995). The Indonesian National Qualification Framework/KKNI Team (2015) concluded that university graduates must be prepared (in addition to human literacy) to be able to have data literacy skills such as analyzing and using big data information and technology literacy. Practical work in companies is one of the references in effective learning.

Learning is the activity of organizing and organizing the environment around students that encourages and facilitates every student in conducting learning activities. The learning process consists of interrelated and interdependent components (Sudjana, 2009). There are four steps that accountants must take in dealing with the Industry Revolution 4.0 consist of awareness, education, professional development, and the application of high standards (Burrit, 2016).

The rapid development of technology and information is due to the automation that occurs in various fields, new and fundamental digital technologies and approaches (Raymond R Tjandrawinata, 2016).



Source: Aslin (2019)

Figure 1: 2.1 Industry 4.0

Professional skills of accountants that must be developed in facing the digital era include computer science, maths and statistics, business or domain expertise, data analysis, machine learning, traditional software, and data science (Martani, 2018). Other skills that must be improved consist of: (1) Technical Skills (data processing, statistics, visualization); (2) Business Understanding Skills; (3) Soft Skills (communication, critical thinking, experimentation, questioning).

Software will be an important key for the production process in the era of the industrial revolution 4.0. The automation pyramid in modern production systems will require various systems that work intelligently to run optimally (Rojko, 2017).

Forecasts for 2055, half of the current work will be automated. Humans will work together with machines effectively and efficiently to improve the welfare of the population (Bughin, J., Manyika, J., & Woetzel, 2017).

Universities must be able to work closely with industry to ensure that graduates will have the skills needed in the era of the industrial revolution 4.0, such as the use of big data technology (Crawford, 2015). Blended learning is an innovative effort that combines learning in the classroom (offline) and online (Lalima and Dangwal, 2017). Trends that can change the role of management accountants by utilizing artificial intelligence based technology include: (1) enterprise performance management (EPM), including business analysis, (2) predictive accounting, (3) improving management accounting methods; (4) IT management and shared service as a business; (5) better skills and competencies in behavioral cost management, and (6) strategic planning (Meskovic, E., Garrison, M., Ghezal, S., & Chen, 2018).



Source: Tetsu (2019)
Figure 2: Era Society 5.0

Based on Figure 2.2, Society 5.0 aims to achieve a Super-Smart Society that will create wealth by making the most use of ICT and integrating cyber spaces with physical spaces (real spaces). The strategy is intended to provide the necessary information when it is needed through the Internet of Things (IoT) and Artificial Intelligence (AI) and to lead to specific social innovations. Society 5.0 will lead to the elimination of a sense of helplessness and the realization of a society in which people can be hopeful, a society in which people can respect each other beyond generational borders and a society in which everyone can work comfortably (Tetsu, 2019).

3. RESEARCH METHOD

This study was conducted using analytical, descriptive, qualitative methods, supplemented by literature studies. The stages discussed in this study are the mapping of accounting strategic learning within the framework of the Industrial Revolution 4.0 and Society 5.0, identification, and analysis of applications in tertiary institutions.

As a first step, the Higher Education strategic environment is identified for systems that meet related parties. This mapping will look at the nature of the relationship and the method of relationships that are carried out effectively. Accounting learning is expected to improve the quality of planning activities to be carried out through a structured map.

The study continues with a literature study on the revision of the accounting curriculum in higher education institutions that is more responsive to the Industrial Revolution 4.0 and Society 5.0. At the end of the study an analysis of learning, challenges, and opportunities related to Society 5.0 in Higher Education, both those that have been done and those that have not been done. From this analysis, the stages of improvement and coordination of Higher Education and its strategic environment are identified.

4. DISCUSSION

In the digital era and technological developments, the flow of information goes so fast, technology and the internet are changing views in obtaining information, including in the world of business accounting. The existence of technological developments makes not a lot of human resources needed in business, including accounting staff. This causes the accounting profession to underestimate the influence of technology on the work of accountants. This formidable challenge must be answered immediately and a solution sought.

The Industrial Revolution 4.0 began with the technology that made human life easier. Later on, this revolution instead caused troubling problems. This comes from the impact caused by the community, namely the loss of certain types of jobs, although there are predictions that new types of jobs will emerge.

The birth of the digital era, led to global connectivity that makes people connected to each other and provide extraordinary responses. Changes in technology will bring up a new paradigm that is very high difference in the future. The anticipation is how people around the world use technology for themselves, now and in the future.

Companies that work for accountants who are able to survive are companies that are able to see opportunities in the era of disruptive technology, make business transformation quickly, adjust to the tastes of consumers and also the business environment. Companies do not need to be large, but companies need to be innovative and efficient in operations.

The potential technology that replaces the role of the accounting profession is only a matter of time. The role of accountants will be more strategic and consultative. Therefore, in mapping the strategic learning of accounting in the Industrial Revolution 4.0 and Society 5.0, the accounting profession really needs to have certification and be able to be technologically able to survive in competition. Accountants must also have a strategy, including mastery of soft skills consisting of interpersonal skills, intra-personal skills, technical skills, and business understanding skills in order to survive in the digital era.

Big data functions to record all data and activities that have been carried out to then predict what might happen in the future. Big Data has a roaming that goes far beyond social media networks because it affects almost every aspect of modern life. Many conventional companies have begun to switch to online media because the media is more accessible, both small and large companies. The availability and use of big data is certain to be unavoidable in future businesses.

The use of technology media in the learning process in the classroom is expected to increase student interest in learning. The conventional learning process is felt to be less enjoyable and fairly monotonous. In addition, learning that is only centered on teaching staff and books will make students bored with learning in class.

Learning mapping is done strategically by Kemenristekdikti together with Universities. There is a difference between universities in big cities and remote areas. There needs to be equality in Indonesia between these gaps in order to compete. The map in Indonesia be it State Universities and Private Universities through learning patterns. Learning objectives need to be standardized. Higher Education must be able to translate the things that have been contained in the Indonesian National Qualification Framework (KKNI). In producing human resources that are adaptive and innovative to technology, it is necessary to improve learning facilities and infrastructure in terms of computerization, the internet, information technology, and big data analysis. An optimal innovation breakthrough will increase the productivity of technology-based industries. Higher education institutions that provide learning infrastructure will be able to produce competent and skilled graduates covering aspects of technological and human literacy.

The next discussion is the revision of the existing tertiary curriculum and is more responsive to the Industrial Revolution 4.0 and the subsequent reconstruction of the Society 5.0 curriculum. Important things that can be done are redesigning the learning curriculum. Curriculum with digital and human digital based expertise approach. Information technology based learning system. With a more responsive curriculum it can be a solution for young people in remote areas for better and better quality higher education. Preparation in producing graduates who are able to adapt to Society 5.0 is one of the ways that Universities can do to improve competitiveness of competitors and attractiveness to prospective students.

Changes in the current global economic landscape must be addressed by accountants. This change makes the accountant profession a central and strategic profession in various sectors. Accounting learning and curriculum need to be constantly revised to keep up with the changing times by adding information technology in accounting courses in the era of the Industrial Revolution 4.0 and later in the face of Society 5.0. The use of human resources began to decrease in the Industrial Revolution 4.0 era. The role of the accountant profession is also changing, namely: (1) analyzing the results of processed data statistically; (2) making non-financial reports; (3) changes in the role of accounting which was originally a book keeper into an analyzer; (4) checking data quality.

Based on an analysis of learning conducted by the Indonesian Institute of Accountants (2019), the role of accountants in Indonesia in further detail is as follows: (1) Identifying questions on data; (2) Conduct statistical analysis; (3) Checking data quality; (4) Interpreting the results of data processing; (5) As a general business advisor; (6) As a specialist advisor; (7) Taking the role of a business partner (8) Manipulating data; (9) Working with robots or similar machines; (10) Train the artificial intelligence model (artificial intelligence); (11) Sustainability; (12) Non-financial reporting; (13) Cyber Security.

Based on the analysis of the Indonesian National Qualification Framework (2015) states that the standard of skills that must be mastered in accounting learning is general skills that are able to apply systematic, logical, critical, and innovative thinking in the context of developing science and technology, mastering techniques, principles, and knowledge of procedures about the use of information technology. Specific skills in accounting learning are able to independently create business processes in accounting information systems that support the provision of information technology-based information. This skill is useful to support management control and the decision making process with the System Development Life Cycle.

Fintech is a technological innovation in the financial sector, including innovations in investment, financial literacy and education, retail banking, and even cryptocurrency such as bitcoin. An increase in the use of financial industry technology (fintech) can increase the reach of financial services and create ways for entities to have access to all financial tools and services at affordable costs.

Rapid technological changes in the field of technology have an impact on the development of education in the Industrial Revolution 4.0. Educators must be able to adapt to existing changes, so that learning Accounting will be more effective. 4.0 Industrial Revolution today, almost all fields using digital, cyber and internet. Conventional learning is considered to be no longer his era. Educators must be able to upgrade themselves in accordance with existing developments.

The challenge in Higher Education is to try to follow the era that is happening. Every college student also needs to be educated to become an entrepreneur, not just as a job seeker. Things that need to be considered as a challenge for tertiary institutions are learning time, individual attributes (such as personality and genetics), and living era. This challenge can be used as an opportunity.

In January 2019, Japan launched the era of Society 5.0 as a continuation of Revolution 4.0. Era society 5.0 uses technology and information not only for

business activities, but for daily human activities that are integrated with information technology and databases. This opportunity is a combination of the use of artificial, big data, drone, robots make technology work optimally and provide support and support for human daily activities. This technology also facilitates services in the fields of health, transportation, and education.

Existing technology does not necessarily degrade the role of humans in life. Humane thinking, innovating, and determining policy are things that can only be done by human beings. Changes in the current global economic landscape must be addressed by accountants. This change makes the accountant profession a central and strategic profession in various sectors. Accounting learning and curriculum need to be constantly revised to keep up with the changing times by adding information technology in accounting courses in the era of the Industrial Revolution 4.0 and later in the face of Society 5.0. The use of human resources began to decrease in the Industrial Revolution 4.0 era. The role of the accountant profession is also changing, namely: (1) analyzing the results of processed data statistically; (2) making non-financial reports; (3) changes in the role of accounting which was originally a book keeper into an analyzer; (4) checking data quality.

For blended learning, in addition to using e-learning, it also maintains offline learning process (face-to-face). In face-to-face learning held in class or in the laboratory is still relevant and is very necessary to transfer aspects of skills and affective aspects. The digital learning process will be effective and optimal if it is carried out directly using tools with assistance from the lecturer teacher. Cultivation of an independent, disciplined, responsible attitude will be effective if done through a direct learning process in the classroom.

In improving learning, the need for now is the ability to collect data into big data and analyze big data into useful information in decision making. The knowledge and skills needed to collect big data are mathematical and computer science skills with programming activities. To analyze the big data that has been collected, knowledge of statistics and consumer behavior is also needed. The development of technology and social media are constantly being updated, so we need learning methods that are able to produce experts with good and optimal capacity.

Technological developments will change aspects of business management. In funding business, many assets will be technology. Resources needed in business do not require a lot of human resources recruited, including accounting staff. Creation and development of new companies based on virtual offices / shops. Finally, through the sale of products and services through the online marketplace.

In the future, the accounting profession and accounting firm are required to develop mobile applications to be able to access data directly from mobile devices and tablets. Financial statement audits are conducted on a real time basis. Regulators and auditors will pull the required data automatically directly from the system and sensors attached to operational activities. Through this stage, the accuracy of the data will be accountable and more transparent. If the accountant profession does not have adequate expertise in information technology, then another profession will take over the function of the accountant.

The accountant profession in the perspective of the industrial revolution is no longer a "book keeper" but is developing and expanding into a profession that is more than a financial aspect. Exploration of new things also naturally led to specialization that did not exist at the present time. The specialization will increase into new fields of work that demand the capabilities and capacities of each different resource. The accountant profession is needed to be able to see the potential changes in the short and long term. The gap between the real world of work and the academic world should be connected and given constructive and informative solutions.

5. CONCLUSION

This paper has described the influence of the Industrial Revolution 4.0 and Society 5.0 on the oversight of accounting learning. For further development an analysis of the strategic environment, challenges and threats are appropriate. Thus, it can be concluded that the accounting profession has partially anticipated the Industrial Revolution 4.0 and the coming of the Society 5.0 era, but there are still many opportunities for improvement by noting all the challenges and threats that have been identified. There needs to be commitment from every student in learning.

Interactive learning processes that focus on character development can be realized with the presence of digital technology in mentoring relationships, not teaching. While in research activities in universities carried out in collaboration with the industrial sector to explore alternative solutions to problems. Technology underwent a revolution, but humans remain as needed social creatures and interactions with each other. So, professions that maintain interactive relations with equality and ethics still exist and adaptive.

For the future of accountants, it can be concluded that accountants need to provide information using mobile applications for their clients, so that each client can access accounting data and business activities from a

mobile phone or smartphone. Accountants must be able to manage internet-based corporate data and understand technology. Audits of financial statements in the future will be based on real-time. The regulators, auditors, and users of financial statements will immediately withdraw data automatically from the system and sensors inherent in operational activities. If the accountant is unable to provide information, then other professions can take over the function of the accountant. The accounting profession remains an expert in the field of financial information providers.

REFERENCES

- [1] Aoun, J. . (2017) *Robot-Proof: Higher Education In the Age of Artificial Intelligence*. US: MIT Press.
- [2] Aslin, E. A. (2019) *Tantangan dan Peluang yang Wajib Disiasati di Era Revolusi Industri 4.0*. Available at: <https://finata.id/blog/tantangan-peluang-disiasati-di-revolusi-industri/>.
- [3] Bughin, J., Manyika, J., & Woetzel, J. (2017) *A Future That Works: Automation, Employment, and Productivity*. New York: McKinsey&Company.
- [4] Burrit, R. (2016) 'Industry 4.0 and Environmental Accounting: A New Revolution?', *Asian Journal of Sustainability and Social Responsibility*, 2(12).
- [5] Christensen, C. M. dan J. B. (1995) 'Disruptive Technologies: Catching the Wave', *Harvard Business Review Journal*.
- [6] Crawford, D. (2015) 'Prescribing an Accounting Curriculum', *The CPA Journal*, pp. 6–11.
- [7] Deloitte (2017) *Industry 4.0 Challenges and Solutions for the Digital Transformations and Use As Exponential Technologies*. Deloitte AG, Zurich. Available at: www.deloitte.com/insights.
- [8] Gulo, W. (2002) *Strategi Belajar Mengajar*. Jakarta: Grasindo.
- [9] Jalal (2018) 'Indonesiana-Kemajuan Teknologi dan Masa Depan Umat Manusia', *Tempo*. Available at: <https://indonesiana.tempo.co/read/122323/2018/02/04/jalal.csri/kemajuan-teknologi-dan-masa-depan-umat-manusia>.
- [10] Lalima and Dangwal (2017) 'Blended Learning: An Innovative Approach', *Universal Journal of Educational Research*, 5(1), pp. 129–136.
- [11] Martani, D. (2018) *Akuntan di Era Revolusi Industri 4.0*. Available at: <https://staff.blog.ui.ac.id/martani/files/2018/09/Akuntansi-di-ERA-Revolusi-4.0-25022019.pdf>.
- [12] Mayasari, D. (2019) 'Mengenal Society 5.0, Transformasi Kehidupan yang Dikembangkan Jepang', *m.timesindonesia*.
- [13] Meskovic, E., Garrison, M., Ghezal, S., & Chen, Y. (2018) 'Artificial Intelligence: Trend in Business and Implications for The Accounting Profession', *Internal Auditing*.
- [14] Raymond R Tjandrawinata (2016) *Industry 4.0: the industrial revolution of the century and its influence on the field health and biotechnology, Working Paper from Dexa Medica Group*. Available at: <https://www.researchgate.net/publication/293695551> (Accessed: 2 February 2016).
- [15] Rojko, A. (2017) 'Industry 4.0 Concept: Background and Overview', *International Journal of Interactive Mobile Technology*, 11(5), pp. 77–81.
- [16] Rukmini, E. (2018) 'Kembali ke Kelas', *Harian Kompas*.
- [17] Sudjana, N. (2009) *Penilaian Hasil Proses Belajar Mengajar*. Bandung: Remaja.
- [18] Suryabrata, S. (2010) *Psikologi Pendidikan*. Jakarta: Rajawali Pers.
- [19] Tetsu, M. (2019) 'International Cooperation: From TICAD7 to the SDG Summit', *The Japan Journal*, 16(2), pp. 4–9.
- [20] World Economic Forum (2016) *The Fourth Industrial Revolution: What It Means, How to Respond*. Available at: <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.