

Facing Industry Revolution 4.0 for Millennial Accountants

Bambang Leo Handoko, Archie Nathanael Mulyawan, Josephine Samuel, Klara Karlita Rianty, Steven Gunawan

Abstract: *The background of this research is to give an overview to millennial accountants of various challenges that will be faced by the accounting profession in the future. The background of writing this essay is because Indonesia will be affected by the Industrial Revolution 4.0 which will cause jobs to disappear, emerge and change. This research is directed to solve the solutions that occur in millennial accountants in making strategies to deal with these changes by paying attention to conditions in the 4.0 era where technology has developed rapidly and is living side by side with humans. Technology that has developed rapidly is certainly not an obstacle for millennial generation accountants to get a job. One technology that is booming is Artificial Intelligence (AI). AI Began to become a part of work activities at the start of the Industrial Revolution 4.0. With this advanced technology, all things can be handled well and is a helper for today's companies in processing large amounts of data. Therefore, many people assume that the role of accountants will be replaced by machines. But if you look further, it is the lack of skills and information regarding the operation of the technology that causes new accountants such as millennial generation to feel threatened by the presence of technology. By learning more about the accounting profession in the future, accountants can collaborate with machines to advance life as a unit of valuable assets. All of this was done so that they could remain competitive and not be left behind in the rapid development of technology.*

Keywords : Millennial, industry revolution 4.0, artificial intelligence, professional, accountant

I. INTRODUCTION

Nowadays, the world is faced with the Industrial Revolution Era 4.0 which is characterized by the use of rapidly developing technology in almost every aspect of human life. The Industrial Revolution 4.0 was first introduced in Germany in 2011 at the Hannover Trade Fair by a group of representatives from different fields (business, politics and academia) [1]. The fourth industrial revolution took the automation of the manufacturing process to a new level by

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introducing flexible and adaptable mass production technology. Tasks that were once done by humans, over time can be replaced by mechanical power that automatically performs and manages jobs faster [2].

However, according to the latest reports titled 'Automation and the future of jobs in Indonesia: Jobs that are lost, appearing and changing', not all job assignments can be digitized. In general, the report states that digitalization has the potential to increase productivity and gross domestic product (GDP) growth and can generate higher income for Indonesian workers and create market opportunities for companies [3].

The generation that faces the challenges of the industrial revolution 4.0 is the millennial generation. Millennial or also called Generation Y is the generation born in years between 1980s – 1990s. According to data from the Ministry of Women's Empowerment and Child Protection, the Republic of productive age is quite high, because around 50.36 percent of the total population of Indonesian age (KEMENPPPA), the percentage of millennial generation in 2019 is 33.75 percent of the total population. This means that the contribution of millennial generation in shaping the structure of the productive population is basically a millennial generation. As the dominant population, millennial generation will provide demographic bonuses for Indonesia. Millennial will become the main capital for Indonesia to move wheels of development, especially in the economic field [4].

The economic field cannot be separated from the influence of the Industrial Revolution 4.0. The direct impact of the digital age for financial or economic people is, among others, technology-based transactions, more and more variations in economic business models, financial technologies such as Automated Teller Machines (ATMs); credit card; mobile banking; SMS banking; branchless banking, digital capital market, reduction on cash transactions, and many more [5]. Digitalization provides a platform where business can be done digitally. Artificial Intelligence (AI) in accounting and auditing is also used by companies to reduce risk and save costs. The audit office uses artificial learning to measure the level of risk of their clients. This new evolution can be called AI facilitated audit [6].

Globally, the digitalization era will eliminate around 1 - 1.5 billion jobs throughout 2015 - 2025 due to the replacement of human positions with automatic machines [3]. This was also emphasized by [1] who predicted that in 2030 there would be 23 million jobs lost due to automation. This would be a serious problem for millennial, because competition in the global economy was tighter followed by increasingly limited jobs available. One of the jobs that can be threatened is the accountant.



Moreover, the number of people majoring in accounting at various universities in Indonesia is very large, which makes a lot of jobs needed. This is a major challenge for accountants in the era of the fourth industrial revolution. Jobs that originally had to be done in manual processing are now replaced by the system who can perform these tasks quickly, less cost, and reduce the risk of errors and fraud [7].

The business accounting and auditing sector has switched to digital, data analysis also in the digital age has used software. Of course the company will prefer to use the system rather than human labor. So, what will the graduates of accountants do in Indonesia? Accountants at the time of the fourth industrial revolution or so-called millennial accountants will fight over positions in companies that will increasingly be fewer in number, because human labor is needed less and has been replaced by technology [8]. What do accountants need to do to survive in this digital age? Is it enough just to capitalize on theoretical learning on campus and hold a degree in economics that will certainly be owned by all economic students in Indonesia? That is what we will try to answer in this research.

II. LITERATURE REVIEW

A. Millennial Accountants

Millennial generation (also known as Generation Y) is a demographic group after Generation X. Experts and researchers usually use the early 1980s as the beginning of the birth of this group and the mid-1990s to early 2000s as the end of birth. Millennial generation lives in the midst of a digital world with increasingly sophisticated technological developments. Since childhood, the presence of technology made them very familiar with technology so that it refers to an all-round lifestyle. This causes millennial generation to have a tendency to not be independent and not be able to live apart from gadgets and the internet. Of course, technology will also affect the economy, especially jobs such as accountants. Given the development of increasingly advanced times, the accounting profession has become so attached to technology that manual recording is no longer used.

As a millennial professional accountant, the challenges faced are not only required to have creativity, critical thinking, and innovation [9]. Rather, competent abilities in the use of technology-based software. According to the Secretary General of the Ministry of Technology and Higher Education Research [10], Ainun Na'im asked that Indonesian millennial accountants must be prepared to face the challenges of work in the Industrial Revolution era 4.0 [11]. By entering the Industrial Revolution 4.0; will helps the process of running business and industrial activities in increasing productivity, producing machines with intelligence capabilities that resemble humans. This situation becomes a challenge for millennial accountants to compete, especially with a technology called Artificial Intelligence.

B. Artificial Intelligence

Artificial Intelligence is a simulation in a machine that is programmed to resemble the process of human intelligence and mimic its actions, so that the system is now able to think similarly to humans systematically and more quickly, so that output can be generated immediately. These processes are included in learning (acquisition of information and rules for

using information), reasoning (using rules to reach estimates of certain conclusions) and perception. The presence of this technology already began to erase and narrow down some jobs to all companies [6]. Here are the advantages and disadvantages of AI according to [6]:

The advantages of artificial intelligence:

1. Are permanent, do not change (depending on computer systems and programs).
2. Can store various information or data without any restrictions (can be adjusted to the needs)
3. The use of more efficient and accurate time in doing a job (in the work system)
4. Ability to solve complex problems and increase work productivity
5. Can easily duplicate and transfer capabilities from one computer to another

The weaknesses/disadvantages of artificial intelligence:

1. The intelligence that is in Artificial Intelligence depends on what is inputted by the programmer (limited to a program)
2. Limited based on samples that are inputted, cannot innovate or cannot create new things
3. Don't have Common Sense. Common Sense is the ability not only to process an information, but to understand the information
4. Not having the ability to develop knowledge, the development of knowledge on AI depends on the system being built.

C. Artificial Intelligence in Accounting

Artificial intelligence has begun to be used in the world of accounting and has also begun to be applied in several fields [6], for example:

Audit, by using computerization, the AI can easily examine more thoroughly and analyze large amounts of data (Big Data) and summarize it in fast time. This can save the auditor's time because there is no need to use sampling methods and ease the work of accountants.

Risk Management, with the help of AI, companies can recognize different forms of data or numbers. In addition, AI can analyze texts and find differences in order to uncover fraud and fraud cases.

Vendor Reconciliation, processing invoices, sales, cost data can be done automatically so as to simplify the work. In addition to automation, AI also opens jobs with accounting firms that can facilitate a variety of jobs for people who have the expertise and flexibility to adapt the changing technological developments.

Regulations on adjustments and reporting, AI will play a large role in the regulatory system that runs like regulating data on investment portfolios with regulations as well as regulations in the organization.

Trend Analysis, AI helps accountants by gathering data and analyzing it so as to produce quality predictive results based on that data so that it can provide its own value to clients. AI has a broader focus on how data analysis using these technologies can change the way critical business decisions are made.

III. RESEARCH METHODOLOGY

A. Type of research and data

The type of our research is descriptive qualitative research. We use primary data from observations and interviews with related parties. Related parties in this matter are millennial accountants, millennial accounting lecturers and practitioners in the field of information technology. We also conduct information from accounting, information system and information technology study programs students.

B. Data Collection Method

We collect data by conducting interviews with relevant parties then record the results of the interview and summarize it into an article. In addition, we also conduct a literature study in which we summarize the opinions of experts and phenomena that occur and express them in a point of thought for decision making.

IV. RESEARCH AND DISCUSSION

A. Accountant Vs Artificial Intelligence

According to [7], accounting is an information system that measures business activity, processes data into a report, and communicates the results to decision makers made by accountants. As the company grows, more data is managed. Various processes of accounting have not been done manually since the process is very time consuming, and requires a lot of human labor, causing a reduction in effectiveness and time efficiency so that Accountants often make unintentional errors (Human Error) or deliberate fraud (Fraud) to benefit individuals as well as companies.

Therefore technology exists to increase company productivity by replacing manual activities with technology. That way the company can reduce human resources and save costs. Especially with the presence of AI, when operated in the company can help business processes run more quickly [12], accurately and efficiently. So whether in the field of accounting, the accounting profession will be replaced by technology as well?

B. Value That Must be Owned by Accountant

To determine the right strategy to compete in the digital world, it can be started by analyzing human strengths that AI does not have [13], such as:

Creativity, one aspect that AI does not have is creativity. The learning process of Machine Learning / AI starts with the programmer inputting thousands of types of samples, from the sample the machine will learn. So the results of Machine Learning analysis tend to be more rigid, while with creativity can produce thoughts that are "out of the box".

Analytical and analytical skills; the human brain is designed to be able to think logically and complexly. Machine Learning is able to help to conclude the output of analytical and analytical processes more quickly and efficiently, but it still needs humans to analyze the results further and determine decisions about what steps companies must take.

Excellent in their respective fields; manual activities have been replaced by machines, therefore we as millennial accountants must have deep knowledge and understanding in their respective fields, especially prospective accountants who are still studying, need to change their mindset in order to

learn to really master the field, not just to graduate or good grades. Taking certification in the field of accounting will also be an added value for each individual.

Technology; living in an era that has entered the 4.0 industrial revolution, every accountant must be able to use and understand technology. It is undeniable that accounting and technology have become one part so that inevitably Accountants must have the ability to operate software technology.

Big data analytics; Accountants also need to analyze and process big data that stores a lot of information, because not only skills in preparing financial statements are needed, but must be able to design and analyze financial and non-financial data especially in digital form. Data Big refers to data sets that have massive volumes containing very large and varied structured and unstructured data, making it difficult to process and handle through manual databases [14].

There are several characteristics of big data that must be understood, usually called 4Vs which consist of: Volume, Velocity, Variety, and Veracity. Volume of data refers to the size of the dataset that needs to be analyzed and processed. Speed refers to how fast the data is generated. Variety is the scope of data coming from various sources, variations in data types require different processing capabilities. Velocity is the quality of the data to be analyzed. An accountant must pay attention to these things when analyzing big data, 4Vs will affect the quality of the output that will be generated by the accountant.

Understanding information system; According to the results of our interviews, many students from the information systems and information technology majors told us that in the future, the accounting profession would be replaced by an artificial intelligence system (AI) that they created to replace the accountant's function. According on this story, many positive things come from the development of the world of technology that facilitate business transactions and reduce the risk of error [15]. However, accountants will find it difficult to find work and lose out if they only have academic ability. Other skills besides academics are needed to be able to add value to an accountant.

One that can add value from an accountant is to understand the information system. Information systems science studies business processes and how to create technology that can support these business processes. Among them are apps development, system development, and software development. How can this add value to an accountant? Accountants who control the information system can create a system to meet accounting needs, which aim to accommodate business transactions, process them and produce reliable output. The possibility of fraud or fraud, especially in matters that are not in accordance with accounting principles is very small and there is no gap at all. That way the public trust will increase in output, namely the financial statements produced by the company [10].

But of course it is not easy for an accountant to understand the information systems; further education is needed related to the science of information systems. Integration of accounting and information systems can be an advantage and uniqueness for an accountant in the increasingly fierce competition of the industrial revolution 4.0 eras.



C. Accountant and Technology Can Collaborate and Work Together

Many rumors circulate that in the future accounting will be replaced by robots so that accountants will be threatened with losing their jobs. According to the opinion point of view of our group, the position of the accountant will not be completely displaced by technology but rather will present technology in the form of accounting software that will facilitate the work of accountants, so that all processes are carried out by the system and not manually and will produce more accurate, fast output, and less workforce. Of course the presence of this technology will reduce the need for human resources. But the emergence of this technology also opened up new professions that needed both aspects, namely technology and accounting for accountants [14].

After knowing the various values that need to be owned by prospective millennial accountants, here is an insight into the professional opportunities for prospective millennial accountants to collaborate with technology. Professions that can be taken by Prospective Millennial generation Accountants include:

Forensic Accounting: This profession is undertaken by combining accountants with digital technology. Accountants can track evidence of events that violate the rules / standards by including evidence digitally. How to track can be done in a short time and effective [16].

Environmental Accounting: accountants focus on maintaining the company's sustainability of how the company's sustainability can be developed. This can be done by combining AI, by calculating the costs associated with the welfare of stakeholders and the surrounding environment. Accountants can work closely with IT to program computers to simplify data processing so that results can be accurately predicted by accountants about how the company's sustainability for the next few years [17].

Auditor: Auditors can use AI to make it easier to process large amounts of data (Big Data) in a short amount of time. All data will be processed and analyzed using Big Data Analytic to find irregularities and fraud. With the help of technology, the auditor will verify by giving an opinion and prevent audit delay in completing the independent audit report [18] [7].

D. Forensic Accountant

Millennial accountants will have more value if they understand forensic accounting. The still rampant corruption case in this digital era makes us think that digital systems can still be manipulated by humans. So we need investigators who have accountant backgrounds and understand forensics to solve corruption cases. Forensic accounting is the application of accounting discipline in a broad sense, including auditing on legal issues for legal resolution inside or outside the court, in the public or private sector [19]. Forensic accounting is a special practice of accounting that describes the involvement that results from actual or anticipated disputes or litigation. Detection and prevention of fraud in the public and private sectors has always been a problem for law enforcement authorities throughout the world including Indonesia. Forensic accounting can be said to be quite unfamiliar in the ears of accountants. A BPK auditor [20], said that today, accounting is not just recording and making financial reports, but also understanding forensic accounting to solve legal problems related to finance, especially cases that cause losses. In doing its work, an accountant must understand the use of

various forensic technologies, such as XRY Mobile Forensics.

Forensic accountants are used in the public and private sectors, but the use of forensic accountants in the public sector is more prominent than in the private sector. That is because dispute resolution in the private sector tends to be resolved outside the court. Forensic accountants have the same characteristics as accountants and auditors, which must comply with the professional code of ethics. Forensic accountants must be independent, objective and skeptical. The characteristics that must be owned by forensic accountants include, creative, curiosity, not giving up, common sense, business sense, and self-confidence. These six characteristics are mostly owned by millennial, so forensic accounting is indeed a suitable job for millennial accountants.

E. Millennial Accountant Soft Skill

In addition to having hard skills such as information systems, big data analytics, and forensic accounting, a young accountant, especially students, must have soft skills to support their academic knowledge [9]. Soft skill that must be possessed by millennial accountant is such as teamwork, leadership, presentation skills, communication skills, and decision-making. These things are that make humans different from AI. Soft skills are generally sharpened when still studying in college. So, when students, especially accountants, graduate from tertiary institutions, they are ready to compete and face the challenges of the industrial revolution 4.0 with sufficient hard and soft skills..

V. CONCLUSION AND SUGGESTION

A. Conclusion

Industrial Revolution Era 4.0 has a positive impact, namely the development of technology that facilitates human work so that it can be completed quickly, less-cost and with a low risk of error. The economic field is inseparable from the influence of the Industrial Revolution 4.0. The direct impact of the digital age for financial or economic people is, among others, technology-based transactions, more and more variations in economic business models, financial technologies. However, with the financial digitalization it will become a serious problem for millennial generation. Competition in the global economy is increasingly tight followed by increasingly limited jobs available. One of the jobs that could be threatened is the accountant. Of course it is not enough for accountants to only have academic skills, such as: understanding the principles of journalizing accounting and financial reporting. Other capabilities are needed to support accounting knowledge that has been possessed, namely mastering information systems, big data analytics, and forensic accounting. A young accountant, especially students, must have soft skills such as teamwork, leadership, presentation skills, communication skills, and decision-making [21]. These things make humans different from AI. So that by becoming an accountant who is good in accounting, science in technology and good soft skills, millennial accountants will be able to compete in the economic world, both with fellow accountants and with sophisticated technology.



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