# DIGITALIZATION ERA: HOW IS THE FUTURE OF ACCOUNTANTS?

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**ABSTRACT**

*This study aims to determine the accounting profession in the future, will it still exist or will it disappear? Increasingly advanced technology and the era of computerization have made the tasks and jobs of accountants replaced by machines. The development of big data and artificial intelligence has an impact on the accounting profession. This research method uses qualitative methods with data collection techniques using indirect interviews including a literature review. Researcher is a key instrument in this study. The results show that accountants need to be prepared in the face of the digital era. Some accounting jobs will be replaced by machines and robotics. However, there is an accounting profession that will remain. In addition, Accountants must learn about the increasingly complex changes in information technology.*

*Keywords: accountants; artificial intelligence; society 5.0*

## INTRODUCTION

Technology development has taken over accountant's duties previously done manually today it has been replaced by computer or machine. Technology promotes convenience so that accounting process primarily is processed by using computer device which could read financial data. Then what will happen to accountant profession? Will it still exist or replaced by machine or robot? Various studies suggested that accountant is not the only profession which shifts, but all professions undergo it. In Japan several professions have been replaced by robot, commencing from robot for housekeeping, bartender, and hotel receptionist.

According to Subur (2019) in (Rosmida, 2019), 95% accountant profession will be replaced by robot. Development of big data analytics will gain control over basic works of accountant. A study conducted by (Frey, 2013) suggested that 94 percent accountant and auditor profession would be replaced by artificial intelligence (AI), meaning that accountant work shall be automated by a machine. According to (Hoffman, 2017) accountant profession and accounting practitioners as well as education field should be able to adapt with the changes.

On the other hand, according to Bhumi Jariwala serving as an editor of IFAC Global Knowledge Gateway, it was stated that despite the fact that technology has taken over accountant works namely accounting, tax, and audit data collection, however decision making requires to be done by an accountant. Artificial Intelligence simplifies accountant profession from bookkeeper to advisory service. The statement goes hand in hand with the study result of (Jaslove, 2017) declaring that accountants have nothing to fear the presence of AI technology, however they should adjust to new technology. Artificial intelligence as a whole shall add a value for accounting industry and accounting shall have better performance in case of decision making and it shall be supported by data. Moreover, (Poston, 2014) also declared that accountant profession will not disappear in spite of massive technology development. Different opinion and study results on technology effect on accountant profession encouraged the researcher to reconduct a study for the future of accountant profession. Whether accountant in the future will be replaced by a machine or remain to exist forever.

### Accountant and Big Data

Industry revolution 4.0 has been indicated by the presence of massive technology advancement including robotics technology, artificial intelligence, internet of things (IoT) and block chain. Big data is a bigger and more complex data collection particularly from new data sources (Deniswara et al., 2020). According to (Laney, 2012) concept of big data composes of 4V namely volume, variation, velocity, and veracity. In modern development, accountant profession commonly implies that in client observation big data is required to stay competitive and relevant to business environment today (Groșanu et al., 2021). According to (Stancheva-Todorova, 2019), in a

p-ISSN 1693-1378
ISSN 2598-9952

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data-driven organization, data analytical skills are of a central importance for the successful career of accountants both in the finance function and in practice. Big data sets are used to provide new insights on businesses leading to better decision-making, risk management and strategic business solutions.

**Accountant and Artificial Intelligence**

Artificial intelligence could be concluded as intelligent reasoning to make a calculation for the purpose of facilitating works for the users, more controlled computerization system and enabling problems analysis (Singh et al., 2010). According to (Elaine, 2000) in (Chukwuani & Egiyi, 2020) AI is a system which could grasp and learn a new concept and duty, has logical thinking and provides conclusion as well as grasps natural language or visualization requiring human intelligence. AI application in accounting scope began in 1980, where the scope of research conducted by academics and practitioners on IA applications in tax, auditing, accounting management, financial planner and also financial accounting (Stancheva, 2018).

**Accountant and Society 5.0**

In 2019, Japan launched a concept of Society 5.0 promoting human centered (human activities would be done by using technology advancement) and technology based (use of advanced technology, robot, drown, AI, and Big Data). The basic schema of Society 5.0 is that data are collected from the "real world" and processed by computers, with the results being applied in the real world. This schema is not new in itself. Society 5.0 will feature an iterative cycle in which data are gathered, analyzed, and then converted into meaningful information, which is then applied in the real world; moreover, this cycle operates at a society-wide level (Deguchi, 2020).

This concept is achieved when society is fully provided with convenience in their activities. Use of modern-based knowledge namely artificial intelligence, robot, and Internet of Things (IoT) is one of the conveniences obtained. The previous concept was completed by Society 5.0, if in industry 4.0 human could access and distribute information in internet, then in society 5.0 human becomes a part of technology, internet is used to live the life.

To face society 5.0 era, several steps should be done by an accountant. According to (Rosmida, 2019) there are 5 steps to consider namely digital skills, prototype implementation of new technology, international certification-based education, always responsive to technology and business development, and educational institution must prepare digital skills-based curriculum.

**METHOD**

This research used qualitative approach, in which the researcher strived for understanding phenomenon arising in his own perspective. The researcher was a key instrument of this study. The location of this research is in Batam city area of Riau Island Province. Time of research conducted in the range of 2019-2021. Following the steps taken by researchers to obtain research data;

**Determining Subject or Informant**

Sample of this study was purposefully selected and subject (informant) of this study included senior accountants domiciled in Batam City, namely the Head of Indonesian Accountants Association of Riau Islands region, the Head of Lecturers Association Region of Riau Islands, Accountant Educators and Practitioners in Batam City.

The selected informants represent respondents from the regulatory side, namely the Indonesian Accountant Association chairman who has experience as a professional accountant and has leadership experience by managing organizations that oversee accountant members in the Riau Islands region. In addition, from the side of the association, that the chairman of the association is considered to represent the accounting lecturers who are members of the Riau Islands.

In terms of accountant educators represented by senior lecturers who have a minimum doctor's degree and good teaching experience. Then from the side of practitioners or users of accounting graduates selected informants who come from accounting consultants who are experienced in their fields so that they understand the needs and skills of accountants today. These four informants can provide responses and analysis according to the theme of research that researchers do.

**Define a List of Questions**

Informants were provided structured questions, where informants would give their opinions and the opinions were concluded and coupled with several theories by the researcher or conclusion of literature review to support the results. Questions that the author build based on analysis related to research by (Stancheva, 2018), (Stancheva-Todorova, 2019), (Jaslove, 2017), (Gulin et al., 2019) and (Zheng, L, 2018). The list of questions is as follows:

1. Will accountant profession be replaced by artificial intelligence, machine, or robot in the future?
2. Which part or what profession of accounting that may be replaced by artificial intelligence, machine, or robot?
3. Which part or what profession of accounting that may not be replaced by artificial intelligence, machine, or robot?
4. What measures the accountant need to do nowadays to face digital era in the future?

**Data Collections Methods**

Technique of data collection used indirect interview method (using google form) and collection of some literature reviews. Literature review selected includes articles or journal regarding Big Data, Artificial Intelligence, and Society 5.0 published either in national journal or international journal within the period of 2010-2021.

**Analysis Data Methods**

Researchers use coding to summarize and capture the essence of informant coding. The answers of informants were analyzed and linked to some conclusion of prior study results, then the researcher would make research conclusions with SWOT analysis.

**DISCUSSION**

**Will accounting profession be replaced by artificial intelligence, machine, or robot in the future?** Research result suggested that:

*"Technology is a tool facilitating works, certainly by using technology development, accountant's works would be easier, in other words the functions of accounting work will partially be replaced by technology (I1)"* Other opinions stated that *"accounting profession will not be replaced by artificial intelligence, machine, or robot (I3)"*

**Table 1
List of Informants**

| No | Name | Jobs | Code |
|----|------|------|------|
| 1 | ZU | Head of Indonesian Accountants Association of Riau Islands | I1 |
| 2 | MO | Head of Lecturers Association Region of Riau Islands | I2 |
| 3 | LA | Accountant Educators | I3 |
| 4 | FE | Practitioners | I4 |

Sourced: Processed data

Therefore, in order to maintain their existence, Accountants should be able to adapt to technology development and improve their knowledge mastery (Laurensia, 2019). According to ICAEW 2017 in (Stancheva-Todorova, 2019), Accountants can benefit from the intelligent systems as by using their capabilities they will be able to support decision-making by providing better and cheaper data, provide more profound analysis of data and give new insights on business and focus on more valuable tasks after freeing up working time due to AI applications. On other hand, (Zheng, L, 2018) stated that, although artificial intelligence cannot completely replace accounting, accountants should also actively respond to the impact of artificial intelligence. There is about professional ability, management skills, computer skills, analytical capability, decision-making ability, ability to predict and also thinking ability. The results of this study if it is linked to SWOT analysis, then this is our strength as accountants. accountant is still indispensable because of the need for analysis that can't be done by the machine.

**Which part or what profession of accounting that may be replaced by artificial intelligence, machine, or robot?** Research result suggested that:

*"Sections including data entry, bookkeeping, taxation, and asset management will surely be replaced (I1)"*

*"Works of data processing, clerical and reporting will be replaced by machine or technology (I2)"*

Pursuant to results of a study by (Tikurante et al., 2020) it is suggested that the role of accountants today will not be limited to bookkeeping, it includes internal control, providing management with information analysis, particularly with regard to company's financial strategies. Accountants must be able to make a transformation to information technology due to the increase of technology usage within industry revolution 4.0. Furthermore, accountants should provide themselves with non-accounting aspects so as to have advantages other than financial aspects. A study by (Rini, 2019), it was suggested that the use of robotics and data analytics (big data) will take over basic works of accountants (reporting, processing, and classifying transactions). According (Stancheva, 2018) stated that bookkeeping, fraud and prevention detection, financial accounting and reporting, revenue forecasting and also analysis of large amounts of unstructured data is another area with the great potential for automation. Based on the result, that there are some accountant jobs will be lost and

p-ISSN 1693-1378
ISSN 2598-9952

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replaced by machines, so this is a weakness for the accounting profession today.

**Which part or what profession of accounting that may not be replaced by artificial intelligence, machine, or robot?** Research result suggested that:

"*Jobs as auditor, management accounting, information system are likely irreplaceable. This is as a result of the need of accountant's consideration in decision making in case of policy making (I1)*"

"*Jobs as financial and tax analyst and consultant will remain to be required despite the fact that several accounting works will be replaced by machine or technology (I2)*"

"*Job as forensic auditor will not be replaced due to the fact that understanding about human psychology is difficult to detect by technology (I4)*"

According to (Ramardhani, 2014), in the past accountant had a role to make a financial statement and nothing more. Meanwhile, today accountant is expected to be more competent in analyzing financial statement. Some accountant roles in the future include tax consultant, financial analyst, financial planner, and auditor professions. On the other hand, according to (Hakiki et al., 2020), it was suggested that based on activities of accounting duties, digital technology may automatically assist the routine and structure duties only. Non-routine and unstructured duties still require human mindset and skills as well as supporting knowledge namely judgement and wisdom. Therefore, accountant definitely cannot be replaced by digital technology. The results of the study if it is related to SWOT analysis, then this is an opportunity for accountants, where there are certain jobs that will still exist.
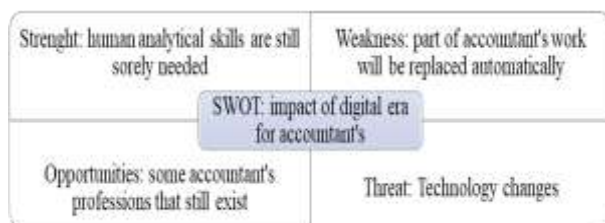


**Figure 1**
**SWOT Analysis: Impact of Digital Era for Accountant's**
Sourced: Processed Data

**What measures accountant need to do nowadays to face digital era in the future?** Research result suggested that:

"*Either professional accountants or academics should improve and sharpen their capability to be more creative so as to tackle the adjustment (I1)*"
"*Accountants need to grasp technology and financial digital (I2)*"
"*Technology and information mastery is required in accounting as accounting will transform into virtual (I3)*"

According to the results of a study by (Friday & Japhet, 2020) it was stated that accountant and accounting process in the future tend to be: cloud-based communication with and through artificial intelligent machine; invest in big data and cyber security, and explore potential virtual reality and augmented reality in fulfilling information of user's requirements. Therefore, accountants and accounting firm are suggested to embrace new skills and IT equipment, and follow technology trend today. A study conducted by (Cahyadi, 2019), it was stated that accountant could remain exist in the era of industrial revolution 4.0 by commencing to learn computer programming and algorithm so as to adapt to transformation, unless using technology, then the role of accountant will be replaced by robot.

According to (Malau, 2021) facing society 5.0, Accountants must be able to manage internet-based corporate data and understand technology. In 2020 according to ACCA (2018) accountants need to improve seven constituent aspects namely technical skills dan ethics (TEQ) and experience (XQ) combined with intelligence (IQ) and digital awareness (DQ), interpersonal attitude, skills, and quality will be depicted in creativity (CQ), emotional intelligence (EQ), and vision (VQ). Based on the result, that accountants in the future will face technological changes, one of which is big data, cloud and IA which is the advancement of technology. Accountants should not stutter the change of technology, but technological change will be a challenge for the profession of accountants in the future.

## CLOSING
### Conclusion

Based on the results of research that some accountant professions will be replaced by machines. One of the accountant jobs that will be replaced is bookkeeping, clerical, data processing and reporting, but there are professions that will still exist, namely auditor, forensic auditor, financial and tax analyst. The development of big data and artificial intelligence has an impact on the accounting profession. Accountants must learn about the increasingly complex changes in

information technology. Conclusion of SWOT analysis is; strength; human analytical skills are still sorely needed; weakness; part of accountant's work will be replaced automatically; opportunities; some accountant's professions that still exist; threat; technology changes.

**Limitations And Recommendations For Further Research**

This research has limitations, so for further research is expected to expand the scope of the research area and conduct a direct interview to informants.

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