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Application of Information Digitalization Technology in Audit Process through Intelligent Process Automation (IPA) Approach

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Abstract

Intelligent Process Automation (IPA) is a technology capable of organizing automation processes for structured, semi-structured, and unstructured data. In audit assignments, there are three types of assignments, namely structured, semi-structured and unstructured assignments. This study aims to identify the possibility of applying IPA (Intelligent Process Automation) in audit assignments. By using IPA technology, it is expected to be able to create efficiency and effectiveness in the audit process. As we know that audit assignments require time and high costs, so IPA technology is expected to be able to shorten audit time and costs without reducing the quality of services provided by auditors. This research is qualitative research using primary data. The respondents in this study are public accountants who work in the Public Accounting Firm (KAP). The research instrument consists of mapping structured, semi-structured, unstructured audit assignments; then identified each with the possibility of applying IPA (Intelligent Process Automation) in each audit process. Respondents in this study were forty-one. The results of the analysis using descriptive analysis and frequency analysis, and it was found that the use of automation of audit procedures at the audit planning stage was still rarely used. With the following details (1) structured assignment, still rarely used; (2) semi-structured assignment, still rarely used; (3) unstructured assignments, sometimes used. Meanwhile, the use of automation of audit procedures at the control and substantive testing stage as well as the overall conclusion (audit completion) stage is sometimes used, both structured, semi-structured, and unstructured assignments.

Keywords: *IPA, structured, semi-structured, unstructured*

INTRODUCTION

All professions today are required to develop their operating systems in accordance with existing technological developments. The goal is to achieve efficiency and effective and competitiveness with the market. Auditing is a branch of economics that utilizes technology to work effectively and efficiently because this field of work is driven by a limited time. Therefore, technology is urgently needed by auditors to help shorten the time required for their assignments without reducing the quality of services provided.

Auditors currently have a high workload (Hanson, 2013) and limited assignment completion time (Ferguson, 2016; Hanson, 2013). Auditors are also faced with high expectations for the quality of the audits provided (AICPA, 2017; Botic, 2018; Harris, 2016) as well as pressures for high audit fees (Asthana, Khurana, and Raman, 2019; Hanson, 2013; Munter, 2015). Therefore, auditors need technology in their assignments, such as Robotic Process Automation and Artificial Intelligence (Harris, 2017; PCAOB, 2019).

Robotic Process Automation (RPA) is a form of business process automation technology that works by automating interactions with end-user desktop GUIs. RPA itself is an evolution of three main

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technologies, namely screen wrapping, workflow automation, and artificial intelligence (Fernando & Harsiti, 2019).

Artificial Intelligence (AI) is artificial intelligence that was created to create a more controlled computing system, make it easier for users and analyze a problem or document. Auditors will be assisted by AI in conducting document reviews, helping to calculate inventory which was previously done manually by visiting clients. In the future, it is hoped that AI can be conducted automatically using cameras and software so that there is no need to physically count the inventory.

RPA is used to process jobs with structured data (Lacity and Willcocks, 2017), while AI can automate the inference of structured and unstructured data processing. To expand the capabilities of RPA and AI, technology is needed that can connect the two technologies to make interpretations faster and more accurate. The technology is Intelligent Process Automation (IPA).

Intelligent Process Automation (IPA) is a technology capable of organizing automation processes for structured, semi-structured, and unstructured data. IPA combines RPA, AI, and other technologies into one pre-configured software capable of executing any combination of processes, activities, and tasks in one or more software systems on a recurring and routine basis with minimal human intervention (IEEE, 2017; McKinsey, 2017).

Research on RPA has been conducted by many researchers such as Rozario, Moffitt, and Vasarhelyi (2018); Yan and Moffitt (2019). Meanwhile, research on IPA in auditing is still very little as we know that IPA is a combination of RPA and AI. To make the auditor's work more effective, the audit process using the IPA approach will help the accounting profession.

As an early stage in implementing digitalization in the audit field, of course, there are still many obstacles and limitations. However, this approach has great benefits for the public accounting profession, so that in the future, this approach can be applied. For this reason, this research proposal is conducted to map the possibility of applying IPA in the audit process. Through this mapping, it will be known the role of IPA in the audit process so that it can assist the auditor in achieving the objectives of efficiency and effectiveness of the assignment.

LITERATURE REVIEW

Although artificial intelligence cannot completely replace accountants, the accounting profession must also actively respond to the impact of artificial intelligence. Therefore, accountants must constantly learn to improve their professional skills, and at the same time, engage in management, thereby making themselves smart management and accountants.

The five science technologies include Robotic Process Automation (RPA), Smart Workflow, Machine Learning Analysis, Natural Language Processing (NLP), and Cognitive Agent. Robotic Process Automation (RPA) is an automation tool to assist routine tasks such as data acquisition and data deletion. Technology smart flow is automation technology in order to connect between the data. Machine learning analytics technology is the process of identifying patterns in structured data by algorithms, such as data about performance. Natural Language Processing (NLP) is artificial intelligence capable of bridging the needs of humans and machines by using machine language. An example is the analysis of data from email and call center conversations to identify customer satisfaction. Cognitive agents are virtual resources built using a blend of machine learning and NLP. This combination is able to help humans in carrying out their duties automatically by studying data sets and communicating them to make decisions, even decisions based on symbol detection.

The application of workflow theory can be applied to the audit process, where the input is in the form of audit evidence, and the output is an audit opinion. The purpose of the audit assignment is to provide assurance on the information provided. Based on audit workflow theory, it consists of primary and secondary workflows. The main workflow in the audit process is the audit completion stage, while the secondary workflow is the audit planning stage, control testing, and substantive testing (Cicchocki et al., 2012). Each secondary level workflow will increase to the main level workflow, and the lower level output will become the input level above it.

After the audit engagement (main workflow) is separated into each type of audit engagement, these assignments are classified into structured, semi-structured, or unstructured assignments (Abdolmohammadi and Wright, 1987). Overall audit assignments consist of 39% structured assignments, while 41% are semi-structured and 20% are unstructured assignments. In a structured assignment, that the problem can be well defined, so it only requires a little judgment to make a conclusion (Abdolmohammadi, 1999). Structured assignments can be managed with Robotic Process Automation (RPA). In contrast, unstructured tasks have unclear problems and have many alternative choices, and require professional judgment to draw conclusions (Abdolmohammadi, 1999). This unstructured assignment will be anticipated by using the Realm of Cognitive Automation. Meanwhile, semi-structured assignments are assignments with limited alternative choices and which require consideration at the intermediate level to make a conclusion (Abdolmohammadi, 1999). This assignment can be overcome by using Robotic Process Automation (RPA) and Realm of Cognitive Automation. Based on the concept of audit workflow and audit task structure, the basic concept of Intelligent Processing Audit (IPA) consists of three frameworks: 1) analyzing audit workflows, 2) automating individual audit tasks, 3) form an IPA loop.

The purpose of the analysis audit workflow is to build an IPA architecture based on a thorough understanding of the structure and nature of audit procedures. The analysis in the audit workflow can be done with the following steps: (1) identifying the main audit workflow process and the secondary audit workflow. Step (2) considers the possibility of reengineering the audit workflow sequence to achieve efficient and interrelated objectives (Alles, Kogan, and Vasarhelyi, 2008; Alles, Brennan, Kogan, and Vasarhelyi, 2006). The success in analyzing the audit workflow is largely determined by these two steps. After performing steps 1 and 2 above, the nature of the audit assignment in the form of structured, semi-structured and unstructured, will be identified.

After the workflow audit analysis phase is done, then build the IPA architecture. The next step is to identify the nature of each audit procedure. There are three characteristics of audit procedures, namely structured, semi-structured and unstructured assignments. This step is the lowest level Step. Structured auditor assignments will use the "Realm of RPA" tool, which can be used to manage data and make data accessible. Meanwhile, unstructured audit assignments will use the "Realm of Cognitive Automation" tool as the basis for making auditor decisions. For semi-structured tasks, NLP and computer vision can be used. Including tasks like contract processing and image processing. For tasks that require professional judgment, the auditor will be entered directly into the workflow. Such a chatbox can be created to collect input for the auditor, which can then be used in subsequent workflows.

The next step after identifying the nature of each audit procedure, then reintegrating each audit procedure into the workflow. This step is carried out until the main workflow is met. The next procedure is to develop workflows according to individual audit tasks. The stage is data management by RPA, and then the data is sent using NLP tools to be integrated with other relevant data and information. By using cognitive assist, data and information processed using NLP will be used by auditors in making risk assessments. After

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identifying the level of risk by the auditor, then the next audit procedure can be carried out, namely testing of controls, substantive testing, and completion of audit assignments.

RESEARCH METHOD

This research is descriptive qualitative research. This study tries to find a picture of a group of people to achieve the group's goals so that the phenomena of the group can be revealed clearly and accurately. The purpose of this study is to identify the possibility of applying Intelligent Processing Audit (IPA) in the process of auditing financial statements.

Moleong (2014) suggests that qualitative research is "a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior". The descriptive method was chosen because the research conducted was related to ongoing events and related to current conditions. The purpose of this descriptive research is to make a systematic description, picture, or illustration as well as the relationship between the phenomena being investigated.

The method of data collection in this study is by using a questionnaire. The respondents in this study are public accountants who work as independent auditors for companies in Indonesia. Questionnaires were distributed using Google Forms.

Research Instruments

In qualitative research, the researcher is the main instrument (key instrument) in collecting data and interpreting data based on a list of questions (Moleong, 2014) because the answers to the questions given in the questionnaire describe the researcher as a constructor of reality based on his observations and experiences in the field.

The list of questions that will be explored by researchers to obtain an overview of the auditor's duties that can be supported by the Intelligent Processing Audit (IPA) in the audit process is based on Zhang's (2019) research. The duties of auditors that can be supported by IPA are as follows: Structured assignments; Semi-structured assignments; Unstructured assignments. The stages in identifying the problem are as follows: (1) Identify the types of structured, semi-structured, and unstructured assignments into each audit phase. The audit phase includes planning, internal control testing, substantive testing, conclusions, and audit reporting. (2) Identify the examples of assignments above and the tools used in the audit process. (3) Based on numbers 1 and 2 above, then identify the application of Intelligent Processing Audit (IPA) in the audit process.

FINDINGS AND DISCUSSION

Based on data processing using descriptive statistics, the average age of the respondents is 36 years; the length of time as an auditor is 3.5 years; The respondent's education level is S1. While the gender of the respondents is male.

The use of automation of audit procedures at the overall audit planning stage is still rarely used. With the following details, (1) structured assignment is still rarely used; (2) semi-structured assignment is still rarely used; (3) unstructured assignment is sometimes used. Meanwhile, the use of automation of audit procedures at the control and substantive testing stage as well as the overall conclusion (audit completion) stage is sometimes used, both structured, semi-structured, and unstructured assignments.

In the audit, there are three types of assignments, namely structured, semi-structured and unstructured assignments. AI technology assists auditors in conducting these assignments. Structured

assignments can use RPA Techniques, semi-structured assignments use NPL techniques, while unstructured assignments use Cognitive Automation techniques.

RPA or Robotic Process Automation is a technology that allows computer software to mimic actions normally performed by humans interacting with digital systems to perform simple and repetitive tasks and business processes. The functions of RPA itself include processing data in a structured format, as we know that in audit assignments, there are structured, semi-structured, and unstructured assignments. This RPA will assist in structured audit assignments. The structured assignments include (1) preparing a permanent file to obtain relevant and significant information, and only for the first-year assignment. (2) Updating permanent files when needed. (3) Conducting a checklist on the suitability of the disclosure of the company's financial statements.

Neurolinguistic Programming or more commonly known as NLP, is one of the techniques developed within the field of psychology that can be applied in various fields, especially, so far it is often used in personality development activities, and it is possible that some of the techniques developed can be applied to support audit activities conducted by auditors.

There are several NLP techniques in audit activities. The first utilization is used by the auditor to have the right mental attitude when conducting audit activities, and the second is a technique that can be used to improve the quality of interaction with the audited party. The third is a technique that can be used to enrich the data collection process.

Auditors in conducting data collection activities often experience difficulties, especially in conducting interviews. This is partly due to auditors having barriers in communication that come from themselves. Status effect communication barriers impact on auditor confidence, and perceptual effect due to differences in perspective between the auditor and the client. These two causes can be minimized with techniques found in NLP (Li and Vasarhely, 2018). In conducting semi-structured audit assignments, the NLP method is very suitable to be used. The semi-structured assignments in the audit include (1) reviewing sales contracts for terms and prices. (2) Reviewing correspondence files, previous year's working papers, permanent files, and previous year's financial statements and audit reports. (3) Reading the information accompanying the financial statements to ensure that there are no material inconsistencies in the information in the financial statements.

Artificial Intelligence has intelligence in thinking, has a broad knowledge base in a limited domain, uses structured reasoning, and in making decisions or solving problems. Artificial Intelligence is the main solution for various cases of auditor failure in detecting fraud.

Artificial Intelligence uses structured reasoning in decision-making or solving a problem (Alles and Gray, 2016). KPMG has successfully implemented by working with IBM to use a cognitive system in the form of the Watson supercomputer. Watson applies machine-learning and Artificial Intelligence technologies. They are able to scrutinize thousands of pages of contracts and documents and then quickly summarize them. It can also check debit and credit data coming in and out and then analyze it to produce accurate financial information (Raphael, 2015).

Artificial Intelligence can provide professional judgment in Audit Opinions, although not completely. The role of the auditor is still needed in providing professional judgment. In addition to judgment, the role of the auditor is also still needed in determining the completeness of the data needed in transactions, parties who have not been involved, assessing the strength of internal control in a company, and whether an asset valuation is reasonable. In professional judgment, Artificial Intelligence will be provided with templates that can read data and translate data simply according to audit report rules to be able to help issue audit opinions independently based on the results of the fraud detection output that has

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been analyzed. The Artificial Intelligence template can discuss an audit opinion accompanied by the adequacy of auditing evidence.

Unstructured audit assignments that use a cognitive approach include (1) Assessing the risks of material misstatement associated with specific account areas and specific audit objectives. (2) Assessing management's attitude about financial reporting. (3) Determining the quality of audit evidence needed to limit risk to an acceptable level.

CONCLUSION AND FURTHER RESEARCH

AI technology can facilitate auditors to automate tasks that have been done manually by humans for decades (Raphael, 2015). AI can make it easier for auditors to review documents that must be reviewed by a company. It is not a new thing that auditors must examine various types of documents with many pages in them. However, the presence of AI can minimize the time used by auditors in auditing financial statements. In addition, AI also functions in recognizing and processing documents that will automatically be connected in a transaction without involving auditor intervention in the future.

In the audit, there are three types of assignments, namely structured, semi-structured and unstructured assignments. AI technology assists auditors in conducting these assignments. Structured assignments can use RPA Techniques, semi-structured assignments use NPL techniques, while unstructured assignments use Cognitive Automation techniques.

Making conclusions and reviewing the work of auditors can be done using AI. AI works by identifying keywords for each document, counting the number of items in each document. AI assists auditors in reviewing the results, and if there are errors in identifying keywords, AI will make adjustments. The development of AI technology is growing rapidly and almost equals the human ability to operate. In carrying out assignments, auditors are required to have a skeptical and professional attitude, such as in risk assessment, evaluation of assessment and accuracy, and accounting estimates. AI will assist the auditor in providing all relevant information for decision making, and however, for skeptical and professional considerations, it is still carried out by the auditor.

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