



Effect of Evidence Sequencing and Big Data Analytics Knowledge on Risk Assessment Accuracy

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ABSTRACT

This study aims to determine how the sequence of evidence and knowledge of big data analytics can effect the accuracy of junior auditors in assessing the risk of misstatement. The research method involved experimentation using a 2x2 factorial design. The study was conducted with 66 junior auditors who work in KAP (Public Accounting Firm) located at Bandung, Bekasi, and Jakarta. The empirical results of this study demonstrate that the sequence of evidence and knowledge of big data analytics do have an impact on the accuracy of risk assessment. These findings have implications for public accountants that knowledge about big data analytics can be used to enhance training and education, ultimately leading to improved performance of auditors in the audit process. This research has not been widely associated with the use of big data analytics knowledge as a basis for research. Currently, big data analytics is more commonly utilised as a supplementary study to provide an overview of the era of the Industrial Revolution 4.0.

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1. INTRODUCTION

The auditor is an independent person who has a responsibility to the public in examining the fairness of financial statements. Financial reports are one of the tools to be considered in making a decision, the data presented in the financial statements are used as a benchmark for investors to invest, so naturally the financial statements are properly prepared and the auditing process is carried out (Chandrasari & Suwardi, 2021). Before carrying out an audit, planning is important to ensure that the audit is carried out adequately (Chandrasari & Suwardi, 2021). To achieve this goal, one of the steps that an auditor needs to take is to assess the risk of material misstatement.

According to SA 315 (2021), assessing risk aims to identify sources of risk evidence, then evaluate whether the source of audit risk is a possible cause of material misstatement of financial statements and assertions. By conducting a risk assessment, the auditor will focus on points that have the potential for material misstatement. However, there are still many cases of imposition of sanctions on public accountants due to fraudulent financial statements and material misstatements, causing distrust of the auditor profession.

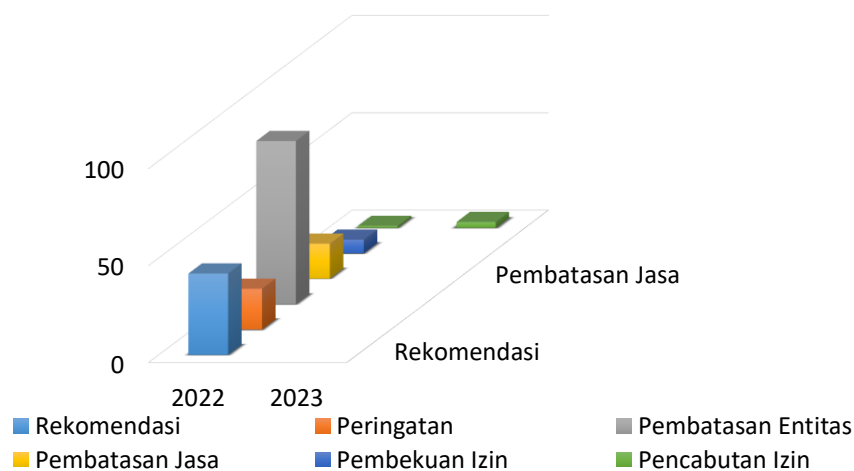


Figure 1. Data on Public Accountant Violations

Source: Center for Financial Professional Development (2023)

Based on Figure 1. regarding data on the imposition of sanctions on public accountants in 2022 and 2023, it turns out that there are still public accountants who commit violations of sanctions based on the classification of minor violations to serious violations starting from sanctioning recommendations, warnings, entity restrictions, service restrictions, license suspension and license revocation. Sanctions stated as a result of serious violations are sanctions for license suspension and license revocation. In 2022 there were seven public accountants who received sanctions in the form of license suspension. While in 2023 the sanction of license revocation (three public accountants) and the sanction of license revocation (one public accountant). In 2023 the license suspension sanction occurred for public accountant Nunu Nurdiyaman and the license revocation sanction occurred for public accountants Armandimas, Abdul Aziz M.N and Rudi Hedianon.

The effect of violations can be seen from the results of audit reports and auditor opinions such as, the number of audit findings, material misstatements, not applying applicable audit standard procedures or auditors failing to assess risk. The possibility of the auditor's failure to assess the audit evidence is due to situational factors and competency factors in the auditor, where these factors are factors that are often faced by auditors which cause errors and failures in conducting their audits.

Situational factors that influence during the audit process are client conditions or the auditor's relationship with the client (Rasmini and Wirakusuma, 2021). According to research by Muliartini and Jati (2019) said in their research that situational factors indicate trust and suspicion due to a variety of information (good or bad) and communication between clients and auditors. If there is poor communication quality in a relationship between client and auditor, it will result in biased information. Bias is a deviation in the process of understanding, managing and making decisions based on information or factual events that are received variously (Pradhana, 2018). If the information received by the auditor during audit planning varies, the possibility of biased information will be higher. One of the situational factors that can influence auditors to assess risk is the order of evidence.

Previous research conducted by Sulistiawan & Wijaya (2015); Ayuananda & Utami (2015) states that the order of evidence has a positive effect on risk assessment. This is because when the auditor is presented with evidence of information in a different order, the auditor will tend to make judgments in a variable manner so that it will affect decision making. In line with research by Ramos & Ashby (2018) which states that auditors may be biased if the client provides information or audit evidence (in the form of physical documents) containing good information and bad information afterwards, the auditor will tend to remember the first evidence received and ignore other evidence. On the other hand, it is different in research by Rofiyah and Almilia (2017) proving that the order of evidence does not affect auditors in assessing risk. This is because when the auditor has initially received information that is less relevant or relevant information, it will not cause weak auditor control in assessing risk.

The next factor that can influence auditors to assess risk is the competency factor. According to Dethan (2018) competence is an auditor's ability to practice the knowledge, experience and expertise that is needed during the audit process which aims to produce an audit process thoroughly, carefully and objectively. Auditors use the knowledge they already have to gain a strategic understanding of the client's business and information to assess the risks inherent in the client's business. Auditors actually already have knowledge in the field of auditing, but the challenges of the accounting profession in the era of the Industrial Revolution 4.0 show that every development of the industrial revolution will experience a shift in business processes which of course 94% of the possibility of human-related jobs such as the accounting and auditing profession will experience automatic changes in the next 20 years, so auditors must have additional knowledge in addition to competence in general.

In improving the auditor's literacy ability to assess audit evidence properly, of course, the auditor must increase additional competencies, so a solution that is most sought after in the era of the Industrial Revolution 4.0 is introduced, namely big data analytics (Luo et al, 2018). According to Arnaboldi et al., (2019) big data analytics is the whole process of

collecting, structuring, analyzing big data so that information can be obtained which is used as material for examination, assessment and decision making.

According to previous research conducted by Misra & Kartika (2021); Sulistiawan & Wijaya (2015); Habbe & Mande (2016) state that big data analytics can affect auditors assessing risk, this is because the higher the use of big data analytics in collecting evidence, the higher the auditor will assess risk. If the auditor's risk assessment is higher, the audit quality will be worse. This is different from research by Fawad (2019) proving that there are doubts about the use of big data analytics to carry out the assessment process. Large and non-diverse data often experience data bias so that auditors find it difficult to identify (Hamdan, 2021). According to research by Fawad (2019); Bachtiar et al., (2017); Hamdan (2021) which states that the use of big data analytics has no influence on auditors in assessing risk. This is because involving big data analytics in the risk assessment process is still very limited, especially in assessing the risk of material misstatement, because if the big data received is not synthesized into a cognitive process, the process will not be useful for obtaining quality data (reliable and relevant) so that the data cannot be fully trusted and cannot be used in the audit process.

This research is important to do because, to conduct auditing, auditors are required to be guided by assessing the risk of misstatement in accordance with Auditing Standard 315 (2021) which states that the auditor's responsibility is to identify and assess financial statement risks. Second, there are no studies that relate using big data analytics knowledge as a basis for research, because currently big data analytics is mostly used as a special study due to the era of the industrial revolution 4.0.

Previous research used more qualitative study methods used by Bachtiar & Habbe et al., (2017); Handoko & Mulyawan et al., (2020); Salijeni, Taddei & Turley (2021); Puthukulam et al., (2021). Meanwhile, Theis, Yankova & Eulerich (2017) used an experimental study. So that in this study will use experimental studies as a research method and use junior auditors as research objects, because previous studies more often use students and investors as research objects. Based on the different findings of several previous studies, this study will link two factors that have not previously existed, namely the order of evidence and knowledge of big data analytics. Therefore, this research is still interesting to do with the topic "The Effect of Evidence Sequence and Analytical Big Data Knowledge on Risk Assessment Accuracy".

2. METHODS

Research methodology is a step to collect information or data in a scientific way and review the data based on its specific purpose and usefulness (Sugiyono, 2012). This research uses quantitative data. This research is an experimental method used to find treatment or treatment (Sugiyono, 2012). This study will use a between subject design, meaning that each participant will only get one manipulation and one treatment. The type of experiment that is considered the most efficient to apply in this study is a factorial design. Factorial design is part of a type of experiment that shows the various possibilities of moderator factorials affecting the treatment of independent factors and dependent factorials (Sugiyono, 2012). The design

form in this study uses the simplest 2x2 factorial design. This study has two factors, namely the evidence order factor and the big data analytics knowledge factor consisting of two levels. The 2x2 factorial design requires four groups or cells as follows:

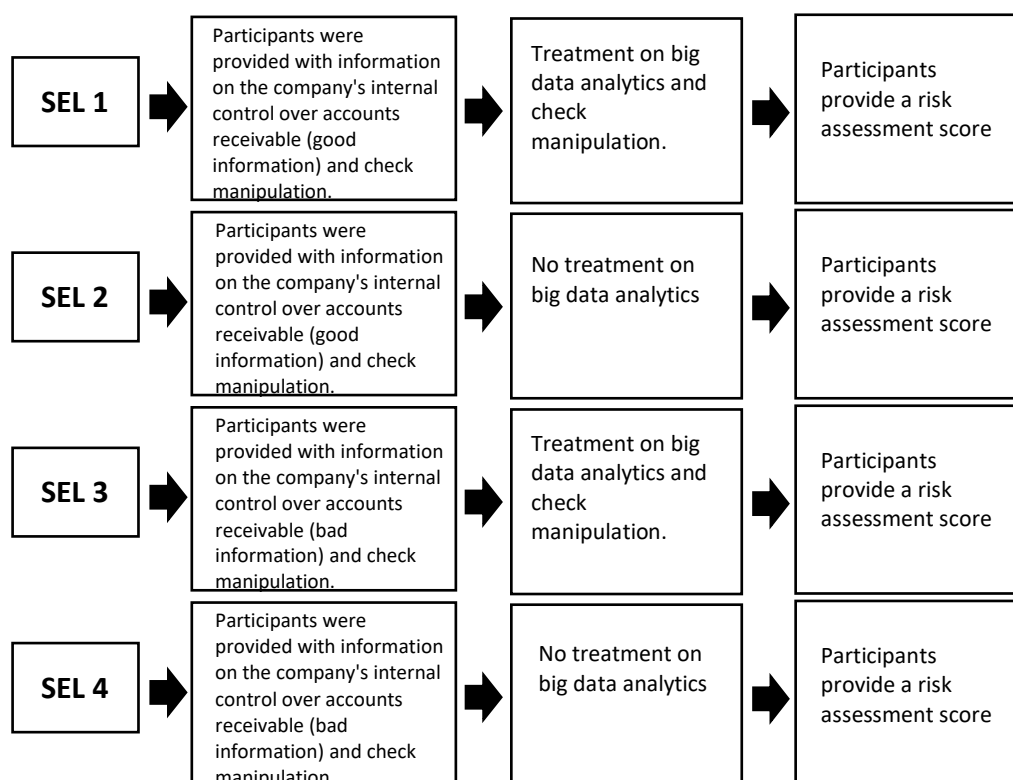
Table 1. 2x2 Factorial Design

Evidence Sequence (A)	Big Data Analytics Knowledge (BDA) (B)		Total
	With BDA (B ₁)	Without NBDA (B ₂)	
Good News (A ₁)	SEL 1 (A ₁ B ₁)	SEL 2 (A ₁ B ₂)	Good News
Bad News (A ₂)	SEL 3 (A ₂ B ₁)	SEL 4 (A ₂ B ₂)	Bad News
TOTAL	BDA	NBDA	A*B

Research Data and Samples

According to Sugiyono (2012) population is part of objects and subjects with characteristics and qualities that can be used to draw conclusions. This study uses participants, namely junior auditors working at KAP (Public Accounting Firm). Junior auditors were chosen to be the research sample because of the experimental instrument in the form of a case study of the company's internal control, so that participants understood the terms, description, objectives, and questions in the case study given. The sampling technique used purposive sampling method. Participants totaled 66 people. The selection of junior auditors as subjects is based on reducing internal validity because the experience of junior auditors is considered less likely to make mistakes in audit risk assessment.

Experiment Procedure



Gambar 2. Experiment Procedure

Based on Figure 2, this study uses an experimental method by distributing several questionnaires according to the group. The questionnaire given to junior auditors consists of several 4-5 component sheets such as filling in the participant's identity, information about the company profile, evidence order scenarios (good information) and (bad information), questions about check manipulation, treatment scenarios regarding big data analytics and material misstatement risk assessment. Each participant in this study only participated in one treatment. Participants in this study were randomly selected to occupy one of the four cells. The scale used to measure risk assessment is one to nine. Participants in the study who gave a material misstatement risk assessment in numbers 1 to 3 indicated a low misstatement risk assessment, participants in the study who gave a material misstatement risk assessment in numbers 4 to 6 indicated a moderate misstatement risk assessment and participants in the study who gave a material misstatement risk assessment in numbers 7 to 9 indicated a high misstatement risk assessment.

The data that has been collected will then be analyzed using the Two Way ANOVA data analysis technique. Before Two Way ANOVA is carried out, data normality testing and homogeneity testing are carried out to be able to proceed to the Two Way ANOVA process to see the main effect and interaction effect.

3. RESULTS AND DISCUSSION

The experimental method in this study was carried out by means of laboratory experiments at 17 Public Accounting Firms spread across three cities, namely Bandung, Bekasi and East Jakarta. This study is to determine the effect between the independent variable and the dependent variable, namely 1) to determine the effect of the order of evidence on the accuracy of risk assessment 2) to determine the effect of knowledge of big data analytics on the accuracy of risk assessment; 3) to determine the order of evidence and knowledge of big data analytics on the accuracy of risk assessment. The number of participants who participated in this experiment was 66 participants including male and female junior auditors. The experiment distribution table is as follows:

Table 2. Division of Experiment and Control

Treatment		SEL	N	Description
Evidence Sequence	Big Data Analytics Knowledge			
Good news-bad news	There is knowledge of big data analytics (BDA)	SEL 1	15	Experiment
Good news-bad news	There is no knowledge of big data analytics (BDA)	SEL 2	15	
Bad news-good news	There is knowledge of big data analytics (BDA)	SEL 3	18	Control
Bad news-good news	There is no knowledge of big data analytics (NBDA)	SEL 4	18	

Sources: Data processed (2023)

Table 2. illustrates that the number of participants in this study were 66 participants. A total of 15 participants received evidence order treatment on good information in the presence of big data analytics knowledge, then 15 participants received evidence order treatment on bad information without big data analytics knowledge. The next 18 participants received evidence order treatment on bad information with big data analytics knowledge and 18 participants received evidence order treatment on bad information without big data analytics knowledge.

Data Normality Test and Homogeneity Test

The test in this study uses a normality test whose purpose is to test whether the sample to be used has normally distributed or abnormal data (Ghozali, 2016). Statistical normality test testing can be done using the One Sample Kolmogorov Smirnov Test (K-S) test, which is required if the significance value above $\alpha > 0.05$, then the data shows normal distribution. Meanwhile, if the Kolmogorov Smirnov Test (K-S) test result is $\alpha < 0.05$, then the data is not normally distributed.

Based on table 3. shows that the results of the data normality test using the Kolmogorov-Smirnov method illustrate a significance value of $0.082 > 0.05$, meaning that H_0 is accepted or the data is normally distributed, so the main prerequisites for using the Two Way ANOVA test are met.

Table 3. Data Normality Test Results

Kolmogorov-Smirnov ^a			
Standardized Residual for Accuracy of Risk Assessment	Statistic	df	Sig.
	.103	66	.082

a. Lilliefors Significance Correction

Sources: Data processed (2023)

Homogeneity testing is a test whose purpose is to determine a set of data with uniform or homogeneous variances (Prayudya & Jayantika, 2018). Variance homogeneity testing is used in this study as a condition for using analysis of variance (ANOVA). This variance homogeneity test can be done using the Levene test, which is provided that if the significance value above $\alpha > 0.05$ means that all data groups have homogeneous variances. Meanwhile, if the results of the Levene test are provided if the significance value above $\alpha < 0.05$, it means that all data groups do not have homogeneous variances (heterogeneous).

Based on table 4. shows that the results of the homogeneity test using the data method from Levene's Test show a significance value of $0.175 > 0.05$ which means that H_0 is accepted and the data variance is homogeneous, so the second prerequisite for using the Two Way ANOVA test has been fulfilled.

Table 4. Data Homogeneity Test Results

	Levene Statistic	df1	df2	Sig.
Based on Mean	1.706	3	62	.175

Sources: Data processed (2023)

Based on table 5. the test results show that the order of evidence has a significance value of $0.040 < 0.05$ so that the first hypothesis is accepted. Furthermore, in the second hypothesis there is a significance value that shows $0.000 < 0.05$, which means that the second hypothesis is accepted. In testing the interaction between the order of evidence and knowledge of big data analytics, the results show a significance value of $0.000 < 0.05$, which means that the third hypothesis is accepted.

Table 5. Tests of Between-Subjects Effects of Evidence Sequence Factors

<i>Tets of Between-Subjects Effects</i>					
Dependent Variable: Accuracy of Risk Assessment					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	191.475 ^a	3	63.825	35.525	.000
Intercept	2367.285	1	2367.285	1317.651	.000
Evidence Sequence	7.891	1	7.891	4.392	.040
Big data analytics knowledge	41.023	1	41.023	22.834	.000
Order of Evidence * Big data analytics knowledge	155.568	1	155.568	86.591	.000
Error	111.389	62	1.797		
Total	2715.000	66			
Corrected Total	302.864	65			

a. R Squared = .632 (Adjusted R Squared = .614)

Sources: Data processed (2023)

The Order of Audit Evidence Affects the Accuracy of Risk Assessment

The first hypothesis of this study is to determine the effect of the order of evidence on the accuracy of risk assessment. Based on the results of table 5. shows that the first research hypothesis is accepted. So it can be concluded that the order of evidence will affect the accuracy of junior auditors in assessing risk.

In conducting an audit based on something that causes risk, the auditor must have an in-depth ability to provide his assessment. The implementation of the audit collects concrete evidence that is both positive and negative evidence. Evidence that is collected accurately can make the evidence relevant. Audit evidence which is good or bad information greatly influences the auditor in making a decision. This is due to the response of an auditor when he first receives evidence. Where when the auditor gets evidence that is good information first compared to bad information, the auditor will usually tend to maintain the evidence of information first received and ignore further evidence.

However, when the auditor receives a second set of evidence with different information than before, the auditor's confidence in assessing the evidence will be reduced. This is what causes the sequence of evidence to affect the accuracy of the risk assessment by the auditor before the audit planning is carried out. In addition, in terms of communication between auditors and clients that is low when the auditor receives evidence provided by the client. When the auditor's level of trust is low, it will affect the information received. There needs to be good communication between the auditor and the client to provide a high level of trust when collecting evidence.

This research is supported by previous research Ayuananda & Utami (2015); Chang Luo (2017); Sulistiawan & Wijaya (2015); Ramos & Ashby (2018) which states that the order of evidence has a positive effect on risk assessment. This is due to a condition where when the auditor is presented with audit evidence in the form of sequential information, the auditor will tend to make judgments in a variable manner. In addition, a person's cognitive limitations will affect the auditor in receiving and processing information. The external factors are examination risk and audit evidence, while the internal factors are trust and communication which will affect auditors in making risk assessments. In addition to the main theory of attribution that became this study, another supporting theory is the belief adjustment model to strengthen the order of evidence factorial. The implication of the belief adjustment model is that a person's complex situation is susceptible to evidence order effects that refer to the final conclusion in the order of presentation and processing of information.

Big Data Analytics Knowledge Affects Risk Assessment Accuracy

The second hypothesis of this study aims to determine the effect of big data analytics knowledge on the accuracy of risk assessment. Based on the results of table 5. shows that the second research hypothesis is accepted. So it can be concluded that knowledge of big data analytics will affect the accuracy of junior auditors in assessing risk.

Currently, the use of big data analytics has been used in almost all financial and non-financial aspects, especially in decision making and business strategies for large companies. The impact of using big data analytics is that data processing which is usually based on human cognition will cause bias, this is due to the limitations of a person's thinking in receiving the information he gets to be processed and analyzed on the basis of information (evidence). With big data analytics, it can change the audit process to be more feasible (Ariestia and Sihombing, 2021). In addition, according to Matahari (2019) there are several benefits that an auditor can use when using big data analysis as audit data, namely being able to gain broader insights or knowledge in depth by identifying evidence (information) from structured and unstructured data, secondly in decision making big data analytics is able to encourage structured and unstructured data as additional evidence in a large and diverse capacity. According to Eberendu (2016); Kaya et al., (2017) structured data is data generated through a company's transaction processing system, such as sales systems, inventory management systems, and relationship management systems between customers and suppliers. In contrast, unstructured data is data that comes from social media such as Facebook, Twitter, Youtube and email in various forms (such as text, audio and video).

In line with previous research Appelbaum et al., (2018); Dagilene & Koviene (2019); Mactavish et al., (2018); Otchere et al., (2021) prove significantly that big data analytics can influence auditors in conducting risk assessments. The existence of big data analytics helps auditors make good judgments in various tasks performed. In the planning aspect, the auditor will make considerations in determining the level of risk and the estimated time required to complete the audit engagement. auditors can use data analysis to extract information from a lot of data to help focus on high-risk audit areas. Data analysis used by big data can also reduce cognitive errors and biased judgments and help auditors to gain an understanding of the information obtained to learn more about transactions in the company. The use of data analytics in the audit process can help auditors to reduce cognitive errors caused by diverse data with a large capacity.

The link between attribution theory and big data analytics knowledge is the internal attribution factor. Knowledge that occurs based on the curiosity of a person or auditor who is able to influence the assessment of evidence. The higher the level of auditor knowledge about big data analytics when conducting an examination, the higher the quality of the resulting misstatement risk assessment.

Evidence Sequence and Big Data Analytics Knowledge Influence Risk Assessment Accuracy

This study is to determine the effect of the interaction between the order of evidence on the accuracy of risk assessment. Based on the results of table 5. shows that the third research hypothesis is accepted. So it can be concluded that the order of evidence and knowledge of big data analytics will affect the accuracy of junior auditors in assessing risk.

Auditors who experience information bias are often the benchmark for audit failure in considering audit evidence and judgment. Auditors who can be affected due to cognitive limitations will likely experience bias (Octavian and Intiyas, 2016). Human cognitive limitations occur in processing and analyzing evidence. Biased information will cause auditor confusion in assessing the risk of material misstatement, due to the client providing a diverse sequence of evidence (information). If the auditor first receives good information followed by bad information, the auditor's tendency to assess risk is low. Conversely, if the auditor receives bad information followed by good information, the auditor's tendency to assess risk is higher. The order of evidence will affect the auditor's accuracy in assessing the risk of material misstatement.

The existence of big data analytics knowledge can help auditors reduce bias in large and diverse data information. This is proven by Holt & Loraas (2021) who state in their research that the existence of big data analytics analysis can reduce cognitive errors and biased auditor assessments. Using big data analytics in the audit planning process can help auditors separate large and diverse amounts of data that have high potential risks. In addition, with big data analytics, auditors get broad and comprehensive data which can later be used as additional evidence during audit planning.

This research is supported by previous research Elgendy et al., (2021); Hamdan et al., (2021); Rakipi et al., (2021) state that big data analysis can assist auditors in processing large amounts of data and diverse company transaction information, this data analysis model

applies an algorithm model to analyze data sets, extract relationship patterns and unknown information. When the auditor is faced with evidence with good information received for the first time, then additional data will be provided through big data analytics that cannot be known beforehand, this can prove that there is an influence on the auditor's judgment to assess whether the risk is low, medium or high risk which can affect the audit process.

4. CONCLUSION

The results of the first hypothesis, show in this study that empirically there is an effect of the order of evidence on the accuracy of risk assessment. This is reinforced by the existence of previous research by Chang Luo (2017); Ramos & Ashby (2017) state that when information is presented in information in a different order, it will provide decisions in assessing different risks. In conducting the audit process, auditors are required to be able to process evidence and information sequentially in order to reduce the level of distrust of auditors for obtaining evidence and information that is less relevant.

The results of the second hypothesis show that there is an effect of big data analytics knowledge on the accuracy of risk assessment. According to Austin et al.'s research, (2021) auditors can analyze and assess entity performance through the use of big data analytics, besides enabling auditors to improve risk assessment, objective procedures and internal testing. Information presented through analysis of BDA which is unclear, incomplete and unstructured will experience obscurity from the information obtained. Weak information processing (overload, irrelevant information and information vagueness) will hinder the effectiveness of big data analytics in conducting assessments. When auditors are faced with unclear information, it will result in poor risk assessment. This is reinforced by research by Bahtiar et al., (2017); Hamdan (2021); states that the use of big data analytics affects risk assessment this happens if the big data received is not synthesized into a cognitive process, the process cannot be trusted, so that it will result in not getting high-quality and relevant data and information if this happens, then the data in the form of information cannot be used in the audit process.

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