

# Big Data Analysis and Its Contribution to Remote Audit

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Accepted: 15 December 2021 | Published: 31 December 2021

DOI: <https://doi.org/10.55057/ijarti.2021.3.4.3>

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**Abstract:** *The COVID-19 pandemic has brought about a change in the audit process. Remote audit process is the best alternative that can be applied. Strategies to anticipate pandemic conditions with all their limitations must be carried out starting from the audit assignment process which usually includes planning, checking documents, field work, interviews, testing, and completing audits, especially to verify critical business functions. On the other hand, Big Data is needed not only to help understand the information contained in the data but also to help identify the data that is most important for current and future business decisions. This makes it easier for people to get the data and information they want. Entities must react quickly to increased capacity of information reporting systems and data analysis. This makes it easier for people to get the data and information they want. The Covid-19 pandemic for Public Accounting Firms in Central Java has also led to changes in giving initial consideration to the risks of material misstatement identified in management's assertions in the financial statements. For this reason, the auditors of the Public Accounting Firm in Central Java need to make changes by carrying out alternative audit procedures to obtain sufficient and adequate audit evidence during the pandemic. Auditors are required to be able to respond to disturbances caused by the Covid-19 pandemic and provide correct information on financial reports. The auditor must be able to modify the audit procedures performed, collect audit evidence and assess the risk of material misstatement, perhaps even provide alternatives to perform audit procedures in accordance with current conditions.*

**Keywords:** Covid-19 Pandemic, Big Data, Remote Audit, Audit Planning

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## 1. Introduction

During the COVID-19 pandemic, the audit process has become difficult for auditors, because on the one hand there is an urgent need to conduct a thorough audit of the completeness, accuracy, assessment, classification, cutoff and disclosure of the audited financial statements, but on the other hand the situation has not allowed the auditor to to conduct field audits. This causes the auditor to try to find other alternatives as a substitute for the audit process which is usually done face-to-face. Remote audit process is the best alternative to implement. Audits still cover all areas but use digital technology, from planning to completion of audits, especially to verify critical business functions. This is in line with the development of industry 4.0 which results in technological changes and faster data exchange. For this reason, connectivity devices are needed to obtain and process large and fast amounts of data.

The presence of big data is expected to answer these needs, because it is able to store, process, and process data and information in a short time. Big Data can help identify the data that is most critical to current and future business decisions. The community is not only a data user but also a data producer. Entities must also react quickly to increased capacity of information reporting systems and data analysis. Public Accounting Firms (KAP) in their work require tools and competencies related to data analysis and developments in information technology, so that data available from various sources can be used by auditors to identify and analyze the data needed.

In recent years, Big Data Analytics has been widely discussed as it refers to the process of collecting, organizing and analyzing large data sets to obtain useful information. Big Data Analytics not only helps in understanding the information contained in the data but also helps identify the data that is most important for current and future business decisions. This makes it easier for people to get the data and information they want. Many organizations reacted quickly to the increased capacity of their information reporting and data analysis systems. The development of big data has an impact on various fields of obtaining information. However, the data still needs to be processed through big data analytics. To perform big data analytics requires special skills. Information generated by big data analytics can be used as audit evidence that is useful for auditors in determining audit opinions. Big Data Analytics will demand more innovative information processing.

In line with the increasingly rapid development of industry 4.0, of course, connectivity devices are needed in obtaining and processing data, the availability of automated network devices, as well as data trends that continue to grow. This requires auditors to master Big Data Analytics, which will make information processing more innovative. Information generated from big data analysis can be used as audit evidence that is useful for the auditor in conducting the audit process based on the auditor's professional judgment. Big Data Analytics will make an important contribution to the general audit process.

However, the lack of comprehensive regulations on data governance (how data collection and processing should be carried out, data audit processes, and data ownership issues) is recognized as a constraining factor. In addition, big data also stores a lot of data, which often contains things that are not really needed by auditors. For this reason, an application is needed that can facilitate the auditor's work in sorting data.

This of course requires auditors to master Big Data Analytics, which will make information processing more innovative and efficient. Auditors have their own challenges how the data that is available in large quantities can be managed and utilized while maintaining client confidentiality, while still paying attention to data governance (how data collection and processing should be carried out, data audit processes, and data ownership), and choosing the right tool. (Coyne & Walker (2018). For this reason, good planning is needed so that big data analysis is expected to be really useful for auditors in conducting the audit process and increasing relevant audit evidence to detect fraud, as well as in making decisions based on professional judgment). auditors (Danescu, et. al., 2014), and with the help of Big Data, it is hoped that this technology can provide more accurate analytical results.

In the current situation, the auditor must maintain audit quality and be able to obtain sufficient and adequate audit evidence to support the audit opinion. Auditors are required to be able to respond to disturbances caused by the Covid-19 pandemic and provide correct information on financial reports until the government declares the end of the Covid-19 pandemic. Then, what

methods do auditors need in planning audits during the current Covid-19 pandemic? and how is the review mechanism carried out?

## **2. Literature Review**

### **Audit Judgment**

Audit judgment is the auditor's policy in determining an opinion regarding the audit results which refers to the formation of an idea, opinion or estimate about an object, event, status, or other type of event (Barrainkua & Espinosa, 2018). The auditor's perspective in responding to information relates to the responsibilities and audit risks that will be faced by the auditor in connection with the judgment he makes. Judgment is often required by the auditor in carrying out an audit of an entity's financial statements. Audit judgment is inherent at every stage in the financial statement audit process, namely acceptance of audit engagements, audit planning, audit testing implementation, and audit reporting. The process of determining judgment depends on the availability of information whether it can be obtained continuously or not, so that it can be considered for determining judgment and is an important factor at all stages of the audit.

### **Professional Judgment**

The auditor's professional judgment is the attitude possessed by the auditor in carrying out his profession (Johari, et.al., 2014). Auditors are said to be professional if they work with a full sense of responsibility (responsibility to oneself, the rule of law and responsibility to society). An auditor must use his professional judgment to determine matters relating to the audit carried out, both in financial audits, performance audits, and audits with specific objectives. These professional considerations include those relating to interference with independence, consideration of the results of previous examinations and follow-up on recommendations related to the purpose of the audit being carried out, professional judgment on audit procedures designed to assess material misstatements and considering the internal control of the audited entity. The auditor's professional judgment will lead to an action to select effective audit procedures so that the appropriate quality of audit evidence is obtained. Professional auditors can also affect audit quality. The professional component of the auditor is needed so that the auditor can act honestly and decisively in carrying out audits with high integrity, so the auditor can improve the quality of the audit results.

### **Big Data Analytics**

Data growth is very fast and accessibility is getting easier is a very big advantage for its users. However, data is just data and cannot be used if it is not "translated". The challenge faced by auditors as one of the big data users is how is that big data stored, managed, and utilized? The answer is to do big data analytics, which is a strategy to analyze big data to uncover patterns and connections that may not be visible so that they can gain valuable insights and information to later become an insight and help in making decisions.

Big data analytics is the process of testing large data sets to find hidden patterns, unknown correlations, market trends, customer preferences and other useful business information. These analytical findings can lead to more effective marketing, new revenue opportunities, better customer service, increased operational efficiency, competitive advantage and other business advantages. "Developing a successful big data strategy for your business" or it can be said to develop a strategy in managing the business. So, with good data management, companies will be able to compete and develop business in their industry. The impact of big data has also penetrated into everyday life, such as the specialized Internet search results generated by big

data feedback. Effective big data applications can enable organizations to identify common bottlenecks, understand customer behavior, and improve performance.

With the existence of big data analytics, what benefits do auditors receive? No longer limited to sample-based testing, big data enables population-based auditing. This is a very useful potential, even able to change the implementation of the audit. Performing a thorough examination of the audit object will provide more relevant audit results, because it can eliminate bias and risk in sample selection. In addition, the large volume of data allows auditors to group data based on different variables (such as number of transactions, time, and location) to find patterns or anomalies which then become the basis for more in-depth tests.

Big Data is all data that in the context of the available size, amount, and amount of data exceeds the capacity and is analyzed computerized to express patterns and trends, especially those related to human behavior and interactions that produce information and are used by companies as a description of values and work processes in a company. period. Big data is an important factor at all stages of an audit, but in other situations, it is possible to use standards regarding how judgment is applied by auditors. has three characteristics, namely volume, variety, and velocity (Mikalef, et. al., 2020). Even though the data is large scale with fast flow, the data is still processed in a timely manner. Big data helps auditors to show what data they get. Big data needs to be transformed first so that it can be easily used and understood by auditors. The process of transforming big data is called big data analytics. The results of big data analytics are useful for companies. Big data analytics has various benefits, including creating new applications, increasing effectiveness and lowering costs than before, and increasing client loyalty.

By using existing big data analytics, auditors can assess whether the company's internal controls being examined are good or not, increasing effectiveness and lowering costs than before. Big data analytics is open (open source) with a development system coordinated by collaborating parties, so that results can be presented in real time and at a low cost (Earley, 2015). Big data analytics also update quickly, so people using it enable faster and more accurate responses. In addition, big data also stores a lot of data, which often contains things that are not actually needed by the auditor. For that we need an application that can facilitate the work of the auditor in sorting the data.

### **Remote Audit**

The Covid-19 pandemic has made some internal auditors start thinking about solutions from audit planning that have not been able to run properly due to travel restrictions, unavailability of client data, shifting client priorities, as well as changes in risk profiles faced by clients. Not to mention that there are calls for work from home, PSBB, or PPKM which causes the client audit process to not run as before. This makes the client have to rearrange his priorities. The client's current focus is on efforts to make the right response in identifying processes and risk priorities. The risk profile faced by the company can be different, especially risks related to revenue, liquidity, human resources, security risks, as well as the data required. Internal auditors must not impose audits that are no longer relevant to current management priorities after the Covid-19 outbreak. However, all of this can be overcome with the support of modern communication technology as it is today which makes it possible to conduct audit assessments from far away places. This is done through the remote audit method.

Remote audit is an audit method used to collect evidence and identify risks by using information and communication technology tools that are used while prioritizing the validity and objectivity of the information/data collected. The remote audit stage is actually the same

as the traditional audit stage, starting from the entry meeting, document review, field visit, interview, and closing meeting. It's just that all stages can be done remotely. Auditors can perform all or part of their audit procedures remotely. Some data and documents can be obtained or accessed from the client's head office. The implementation of this remote audit is made easier if the client has implemented an Enterprise Resource Planning (ERP) application that presents almost all data in digital form, is available, and is integrated in one system.

With this kind of remote audit, auditors may become less productive and not aligned with the company's strategy and risks. However, if the auditor is agile, then this is an opportunity to demonstrate the relevance and contribution of internal auditors in making decisions and solving important problems for clients. Internal auditors are required to show their agility during this crisis so that they are more confident in entering the new normal. This of course must be supported by the use of media as a process of transferring information for audit purposes. With his competence, the auditor can be aware of the risks and opportunities of the information and communication technology used and its impact on the objectivity of the information or data collected.

### **3. Discussion and Conclusion**

#### **Client Data Needs Analysis**

The audit of financial statements focuses more on identifying the risk of material misstatement in financial statement items, so that management is tasked with presenting fairly the financial position. Furthermore, the auditor must be able to understand how management identifies the risks they face. By recognizing the risks faced by management, the auditor will be able to better classify audit areas based on risk so that later they can focus the audit on areas that have high risk. The process of evaluating risk is carried out by taking into account the adequacy of the controls owned, and determining whether the risk is acceptable or not. After the estimation or assessment of the level of risk that arises, it is necessary to continue with identifying and assessing the level of risk.

Risk assessment for financial reporting purposes is the identification, analysis by management of the risks relevant to the preparation of financial statements that are presented fairly in accordance with generally accepted accounting principles. Risks relevant to financial reporting include internal and external events and circumstances that may occur and negatively impact the entity's ability to record, process, summarize and report financial data consistent with management's assertions in financial reporting. Management can make plans, programs or actions aimed at certain risks or may decide to accept a risk due to cost or other considerations. Risks that can arise or change due to circumstances such as changes in the scope of operations, new personnel, new or improved information systems, rapid growth, new technology and the emergence of new competitors.

Audit planning is prepared by considering the risks faced by the company. Internal auditors must be able to take advantage of the results of the assessment and risk due to new regulations, competitors and new technology in the design of the audit program. For this reason, before carrying out audit work, the auditor must prepare an audit plan in a systematic manner because it serves as a guide to audit implementation, the basis for budgeting, a tool for setting standards and controls, as well as the auditor's consideration in his assignment. According to Bychkov, et al. (2014) there are several things that need to be considered when preparing an audit plan, namely (a) problems related to the client's business, (b) accounting policies and procedures, (c) the methods used, (4) determining the level of control risk, ( 5) initial consideration of

materiality, as well as (6) the nature of the audit being reported. The audit plan must be properly prepared and documented.

In addition, the auditor must assess the risk to the achievement of organizational goals even if management does not do so. To develop a risk-based plan, the auditor needs to consider the risk aspects of events/risks that have an impact on the achievement of the organization's objectives, and general risks that can be used to determine audit priorities. For companies that have implemented a risk management process, the auditor can check the risk register to see what individual risks have been identified by management and actions to be taken to address them. On the other hand, if there is no risk management process, the auditor needs to identify possible events that may pose a risk and assess them based on the priority scale of the problem. Therefore, to be able to carry out the assignment, a risk-based audit plan is needed. This risk-based audit planning is needed to provide an understanding of how to develop a risk-based audit plan. This of course will provide assurance that the risk management process will result in effective risk management and take into account the defined risks.

The basic conceptual framework for risk-based audit planning has stages in the form of (1) Recognizing risk by identifying risk information, especially from external sources so that the performance process can run well, (2) Identifying problem findings that may pose risks, (3) scoring on identification of risks that arise, (4) Prepare a risk-based audit plan based on generic risk factors and assessment criteria to determine audit priorities for all audit objects, (5) Presenting the results of risk-based planning by evaluating strategic and annual work plans (Joseph, et al. (Joseph, et al.) 2015). With this risk assessment, it is hoped that later it will be able to control the operational system well. The format for the stages of risk control can be seen in Table 1, Table 2, and Table 3 below:

**Table 1: Relevance of Risk Indicators to Types of Risk**

No	Risk Type	Risk Indicator Relevance

**Table 2: Risk Control**

No	Main Activities	Risk	Possibility	Impact	P*I	Control

**Table 3: Risk Factor Measurement Criteria**

No	Risk Factor	Criteria	Score

According to Tuanakotta (2013), this risk-based audit planning emphasizes the importance and impact of an effective audit strategy and audit plan for the achievement of the goals, objectives and mission of the internal audit unit. Planning provides a systematic approach to internal audit work and requires knowledge that covers a wide range of issues in public management,

including risk assessment and internal control. This audit activity aims to provide assurance about the achievement of the objectives set by the client. The stages of planning this risk-based audit include (1) Understanding the client and its business processes. Auditors are required to set their auditing priorities, such as the vulnerability of transactions that may interfere with the effectiveness of achieving organizational goals. This can be done by looking at the organizational structure, position structure, resources and standard operating procedures. The process of setting goals and objectives, governance, risk management and control is an important point to look at. In addition, the internal auditor must thoroughly investigate the client's business processes to design the scope of the audit; (2)

The preparation and determination of the audit scope is carried out so that the implementation of the assignment can run effectively and efficiently, which is carried out by identifying the organization's programs and policies; (3) Risk identification and measurement is carried out to identify any uncertainties that can have an impact on the achievement of activity objectives, ensuring that the client has developed risk assessment indicators. The process usually involves identifying sources of risk such as the economic, technological, or political environment. (4) Risk analysis is carried out so that the internal auditor can review the nature of the client's operations and then create a risk map for risk assessment; (5) Risk assessment is carried out to design an annual audit based on the risk priority scale; (6) Inventory and determination of risk factor values. From these results a list of assessment criteria will be determined; (7) Assessment of risk factors for client activities is carried out so that the auditor obtains an objective risk list based on management's response or from recommendations for actions or management's acceptance of risk, effectiveness of internal control, potential for fraud, quality of risk assessment, or length of audit time. (8) Determination of risk ranking, carried out based on the priority scale of risk management; (9) Monitoring and review, carried out to ensure the effectiveness of the controls carried out by the client.

### **Remote Risk-Based Audit Planning**

By following the initial stages from planning, internal auditors understand their clients more so that they can evaluate and improve risk management and client operations. If the risk assessment at the planning stage of the audit goes smoothly, then this audit process can optimize existing resources based on the scope of the assignment. Through this remote access, auditors can perform document reviews and analytical reviews at the head office, prior to visiting the client. Furthermore, during a visit to a client, the auditor can focus more on carrying out several follow-up procedures, namely interviewing process actors and observing the implementation of the process in the field. Document review stages depend on the type of data, conditions, and existing media. When most of the data is in digital form, it is easier for auditors to review. However, if the data is in physical form, it must be determined how the client presents the document for review. For document review purposes, the auditor must obtain permission to access the client's documentation system during the audit process. Auditors can also use CCTV footage for several days to make it easier for auditors to conduct reviews, analyzes, and tests. The remote interview phase can be conducted using questions and notes collected during document reviews and field visits. After that, a closing meeting was held to clarify the facts found and ask for input for the draft audit report and recommendations later.

The success of this audit activity is highly dependent on the accuracy and suitability of audit planning in anticipating and considering the company's needs to determine the selection of audit objects, types, scope, and objectives of the audits carried out, estimates of audit resource requirements and allocation of available audit resources. Auditors need to make a picture of the risks that will affect the achievement of organizational goals (Sanusi, et.al, 2015). In

providing audit recommendations, the auditor focuses more on risk management and management control. This uncertain and unstable business condition requires auditors to have the expertise to identify, analyze, and understand all the risks that exist and it is not impossible for members of the audit team to have special expertise in certain fields.

In this Covid-19 pandemic condition, auditors must also maintain independence with respect to the quality of audit reports. The auditor must be able to modify the audit procedures performed, collect audit evidence and assess the risk of material misstatement, perhaps even provide alternatives to perform audit procedures in accordance with current conditions. The alternative implementation that was previously carried out face-to-face with clients is now switching to using remote auditing. The remote audit process is the right choice during the Covid-19 pandemic because most companies limit mobilization and are prioritized only for essential and emergency trips. Ryan (2019) explained that the implementation of remote audits, initial meetings with stakeholders within the company are one of the important things to provide an overview of the audit process that will be carried out by auditors during the Covid-19 pandemic. This is used to anticipate differences in understanding so that undesirable things do not occur during the audit process. At the initial meeting, they also discussed how the audit process was carried out. Through this approach, it can affect the timeliness of receiving the required audit evidence. Audit evidence that is affected in terms of timeliness, among others, is when bank confirmations are made, or accounts payable confirmations are made.

Auditors' professional skepticism also needs to be increased due to the tendency for material misstatements, whether caused by errors or fraud, to occur in the current period due to weak internal controls due to management's focus on Covid-19, unreliability of data, limitations in building good relationships with auditees. so that it can open up opportunities for fraud or concealment of the truth, as well as a lack of transparency in reporting. This is intended so that the auditor's attention can be more focused on risk assessment to determine the scope of audit testing and assess risks for business continuity and development as well as anticipate the possibility of a lack of interaction between the auditor and the company that could result in fraud. because it limits the movement of auditors. Auditors must also enrich their skills, potential, and competencies to be effective in their current work. Each auditor must also have the competence and ability to understand, use and utilize information and communication technology that will be used to carry out audit tasks.

## **Conclusions**

The Covid-19 pandemic has forced some auditors to conduct remote audits as a solution to audit planning that has not been able to run properly due to travel restrictions, work from home, or due to changes in the risk profile faced by clients. The client's focus is now shifting to efforts to make the right response in identifying processes and risk priorities. This makes the internal auditor unable to enforce the audit as in general conditions. The auditor conducts an audit based on the risk priority scale through a remote audit approach. With remote audit, the auditor performs all or part of the audit procedure remotely. Prior to the conduct of the audit, the auditor must prepare an audit plan in a systematic manner because it serves as a guide to the conduct of the audit, a tool for setting standards and controls, as well as the auditor's consideration in his assignment.

This risk-based audit planning emphasizes the importance and impact of an effective audit strategy and audit plan. For this reason, the auditor must increase his professional skepticism to determine the scope of audit testing and assess risks to business continuity and development. In other words, during the Covid-19 pandemic, auditors must carry out strict supervision and



auditors also continue to communicate effectively with management so that the planned audit can run well.

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