Does Forensic Accounting Matter? Diagnosing Fraud Using the Internal Control System and Big Data on Audit Institutions in Indonesia

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Abstract: This study aims to determine the relationship between awareness of the use of forensic accounting and the role of the internal control system (COSO) mediated by Big Data Analysis (BDA) towards interest in using forensic accounting in detecting fraud. The research design is a case study with a quantitative approach. The sample for this study was 331 auditor respondents spread across KAP, BPK and BPKP in Indonesia. The data used is primary data with research methods through interviews and surveys at the Indonesian auditor institutions. The weakness of companies is that on average they still use data systems that are not integrated, so there are risks in terms of data security. The results of this study prove that Big Data Analysis mediates the relationship between Awareness of Forensic Accounting on Intentions of Forensic Accounting. Also, Big Data Analysis mediates the relationship between COSO on Intentions of Forensic Accounting. The results show that the seventh hypothesis proposed is statistically proven. This study proves that the implementation of a good internal control system will be an effective tool to control fraud risk. Internal controls can be fully effective if the organization is able to understand the most vulnerable risks and how to respond to fraud. BDA with data mining techniques that contribute to decision-making and fraud detection. Auditors can find and extract hidden patterns in large amounts of data by using Big Data to detect fraud.

Key-Words: - big data analysis, forensic accounting, internal control system, fraud detection, Audit Institutions, Indonesia.

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1 Introduction

One of the primary purposes of financial statements is to furnish prospective investors, creditors, and other users with information that facilitates logical investment, credit, and analogous decision-making. Financial statements ought to satisfy the qualitative requirements and be presented in adherence to the stipulations outlined in the Statement of Financial Accounting Standards (PSAK No. 1), [1]. However, the results of audits conducted by public accountants do not fully guarantee that financial statements are free from fraud or fraud, [2]. According to a study by Price Waterhouse Coopers, thirty percent of the businesses surveyed had fallen victim to fraud, [3]. Fraud cases that occur in Indonesia occur at PT. Garuda Indonesia Tbk for fiscal year 2018 and PT. Waskita Karya tbk for the 2019 financial year concerning financial statement engineering. 80% of fraud committed by companies in Indonesia is financial statement fraud, [4].

This study is also reinforced by the results of the annual report from ACFE (Association of Certified Fraud Examiners), where 81% of the organizations surveyed have been victims of fraud with losses of USD $ 100,000 per case and 42% of the main perpetrators are from internal management itself, [2]. Due to the company's failure to implement internal controls, fraud occurs, and auditors have the knowledge and abilities to identify fraud in the company's books, [5]. The implementation of the management control system is in the scope of improving information systems and increasing auditor competence, especially in the provision of non-audit services (Tax, investigative audit, consulting services) improving the performance of public accounting firms, [6].

The existence of fraud cases in America, namely Enron, Worldcom, Adelphia and others, where the case is very detrimental to stakeholders and users of financial statements (creditors, investors,

shareholders, the public) then this triggers the publication of Sarbanes-Oxley (SOX). The Sarbanes-Oxley Act (SOA) was created by the American Association of Certified Fraud Examiners (ACFE). Research on Taiwanese audit firms shows that the effect of SOX is further enhanced control systems using MASs (Management Advisory Service) strategies and alliance collaboration among audit firms, [7].

The speed at which financial information or statements generate data and the volume of data they contain make it difficult for auditors to identify and extract hidden patterns in such data, rendering analysis and drawing accurate and pertinent conclusions only with big data analytics (BDA), [8]. BDA can find unexpected patterns that cannot be detected when small samples are used in regular audits, [8]. But at the time auditors used BDA there was also a gap in the role of BDA towards practitioners' intention to adopt forensic accounting, [8]. Limited auditor skills in analyzing large volumes of data have an impact on auditors' difficulties in accessing and identifying relevant data. Auditors must ensure the accuracy and reliability of audit results on large enough data; therefore it becomes a problem if there are no tools to be able to find potential fraud, [9].

It is critical, both inside and outside the auditing profession, that BDA techniques be recognized as legitimate in order to guarantee their application during audit engagements. In the execution of digitally advanced audits for client financial statements, the incorporation of Big Data Analytics (BDA) as an additional source of audit evidence reinforces the practical legitimacy of BDA within the auditing profession, [9]. There are numerous prospects for applying big data methodologies in the field of auditing, specifically when stringent analytical protocols are integrated with conventional auditing approaches and expert opinion. Recent advancements in financial hardship models and big data financial misconduct could benefit audits. Additional research is warranted on sentiment analysis and natural language processing as they are potentially valuable audit tools. Emerging research avenues in auditing, including collaborative platforms, peer-to-peer marketplaces, and real-time information management, are ideally adapted to big data methodologies, [9]. The purpose and objectives of this research is to examine the relationship between forensic accounting, internal control systems (COSO) and the use of big data to detect fraud in Audit Institutions in Indonesia.

Auditors are cognizant of the importance of utilizing forensic accounting to detect fraud, and big data analysis (BDA) reinforces and facilitates these activities. This assertion is grounded in the findings of studies examining internal and external auditors in Indonesia, [10], [11] and India, [12]. Additional studies demonstrate the efficacy of the Committee of Sponsoring Organizations (COSO) model in fraud detection and prevention. According to the study, all control activities, risk assessment and response, internal control, event identification, and risk assessment and response significantly impact detecting and preventing financial statement fraud at commercial banks operating in Jordan, [13].

The main contribution in this research is that this study integrates the elements of forensic accounting implementation, big data analysis, and the internal control framework (COSO) as assessed by internal and external auditors to identify fraudulent activities, drawing upon findings from previous research. The innovation of this research is that the researcher investigates the potential influence of auditors incorporating big data analytics and organizations implementing the internal control framework (COSO) on the auditors' capacity to identify fraudulent activities at KAP, BPK, BPKP in Indonesia. This combination of 3 research elements such as big data, COSO, forensic accounting is still rarely carried out by previous research.

2 Empirical Literature Review and Hypotheses Development

2.1 Forensic Accounting

The fusion of investigative and auditing methodologies within the accounting field has led to the cultivation of a specialized skill set known as "forensic accounting." This skill set is specifically geared towards identifying and preventing accounting fraud, [12]. Forensic accounting encompasses the processes of ascertaining, documenting, assessing, categorizing, reporting, and validating historical financial data or other accounting procedures to address legal issues. This historical data is also used for the evaluation of financial data in the resolution of future legal disputes, [12].

2.2 Big Data

The term "big data" pertains to extensive and intricate data collections that can be examined to uncover patterns, trends, and connections. It comes from various sources, including social media, machine-generated data, and transactional data. Big data analytics can create value for organizations by

providing insights into operational and strategic approaches, [12].

2.3 COSO (Internal Control System)

Internal control is measured by the original COSO 2013 framework standards adapted from the research of, [13]. They use COSO standards implemented in local governments to prevent fraud. COSO comprises control activities, information and communication, risk assessment, monitoring activities, and the control environment. Respondents were asked to answer questions and were assessed on a Likert scale of 1 to 5 regarding the five components of integrated internal control.

2.4 Fraud

Engaging in any activity that manipulates others for personal advantage constitutes "fraud." When "knowingly misrepresenting the truth or concealing a material fact to induce another to act to their detriment," fraud is considered a criminal offence, [13]. Criminalist Dr. Donald Cressey devised the Fraud Triangle idea in the 1970s. The hypothesis states that a person is prone to commit fraud if all three components are present.

The three components are financial pressure, perceived opportunity, and rationalization. Financial pressure refers to the need for money or other resources, while perceived opportunity refers to the belief that one can commit fraud without getting caught. Rationalization refers to the justification or excuses that a person uses to convince themselves that committing fraud is acceptable. Anti-fraud professionals frequently employ the Fraud Triangle to delineate circumstances that might incentivize organizations or individuals to partake in fraudulent activities. Additionally, the model can be employed to underscore industry-wide or economic circumstances that may contribute to an increased overall risk.

2.5 Previous Studies

Auditors face several problems in implementing data analysis to detect fraud. In addition, the increasing complexity of internal control and the non-integration of one data with another data is also an obstacle for auditors in controlling and detecting fraud. The influence of social media information literacy technology that has not been used for example, is expected to detect fraud accurately, [13]. Therefore, to overcome the above problems, this study aims to develop an effective fraud detection and prevention model by using the IT internal control system (COSO) in forensic accounting and using BDA (data analysis of financial statements, annual reports, social media). This method can assist auditors in overcoming the problem of limited skills in analyzing large amounts of data, as well as in finding, identifying, and extracting hidden patterns in large amounts of data so that audit results are accurate and reliable, [13].

This study examines how Indonesian auditors use BDA, internal control, and forensic accounting to uncover fraud. BDA helps derive structural equation models for fraud detection from research models and theories on forensic accounting awareness. Do results indicate that forensic accounting awareness affects fraud detection practitioners' intentions? BDA extracts hidden patterns in massive data sets to detect financial accounting fraud. We develop a systematic internal control management system rooted in internal control principles and artificial intelligence theory. This paper aims to establish a data analysis model incorporating intelligent identification and early warning mechanisms. Furthermore, the internal control reverse order method facilitates the autonomous evaluation of financial indicators.

The novelty of this study is the creation of a new model that explains in depth the factors that influence auditors using forensic accounting with BDA and IT control systems (COSO) to detect fraud. The model obtained is strengthened using the content analysis method where the new model is obtained from processed and strengthened variables or robustness test, [14], with the use of the Atlas.ti application with the depth interview method, [14] , which can generate new indicators to update the first model by finding more complex factors that influence auditors to detect fraud. With this method, more fraud is detected.

The research roadmap on big data analytics, internal control, and forensic accounting for fraud detection can be seen in Figure 1 (Appendix).

In Figure 2, a Conceptual Framework is depicted, showcasing the correlation between awareness and the utilization of forensic accounting and COSO's internal control system. Big Data is integrated into the framework as a determining factor that shapes the interest in employing forensic accounting to detect fraud.

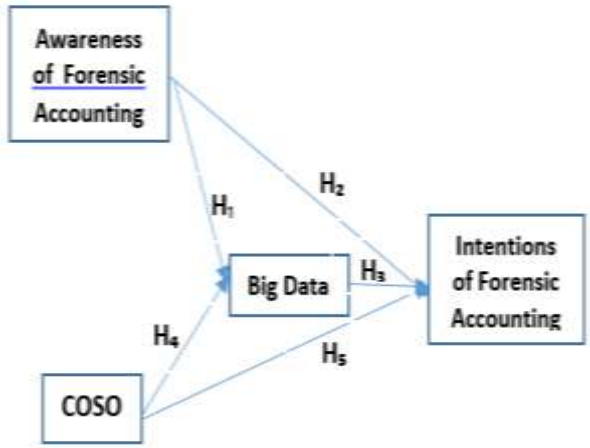

Fig. 2: Empirical Model
Source: Elaborated by the Author

2.6 Hypotheses Development

2.6.1 Awareness of Forensic Accounting and Big Data

Auditors in carrying out their work face several problems in implementing data analysis to detect fraud. Awareness of the use of forensic accounting in detecting fraud is very important for auditors in analyzing financial statements. Where with the use of Forensic Accounting Auditors or examiners can identify misuse of assets and can make financial data or information more reliable and accurate.

The growing recognition of the value of forensic accounting will necessitate an integrated data structure and diminish the significance of utilizing Big Data to detect more fraud and operate more rapidly.

Big data techniques and data analysis are vital for forensic accounting due to the complexity of business transactions and the limits of traditional ways of identifying fraudulent activities. Forensic accountants can apply a variety of advanced anti-fraud techniques such as data visualization, predictive analytics, behavioral analysis, content analysis, social network analysis, and geo-spatial analysis to identify abnormal operations, high-risk areas, and potentially fraudulent activity.

Therefore, it is important to incorporate theoretical knowledge and practical skills into forensic accounting training programs to increase understanding, usefulness, and interest in big data analytics and data analytics. Accountants must have an educational or training background in the idea and implementation of big data and big data analysis, [14]. Forensic accounting awareness may increase the desire to use big data technology to uncover fraud, [14].

H1: Awareness of Forensic Accounting has a significant impact on Big Data Analysis

2.6.2 Awareness of Forensic Accounting and Intentions of Forensic Accounting

The intention of using forensic accounting for fraud detection is influenced by forensic accounting awareness. This hypothesis is based on the assumption that practitioners who have a higher level of forensic accounting awareness will be more willing to apply forensic accounting for fraud detection.

The study used data analysis to test this hypothesis and found that this hypothesis was supported by data, which suggests that practitioners who have a higher level of forensic accounting awareness will be more willing to apply forensic accounting to fraud detection, [15]. The need for forensic accounting arises because an organization's conventional internal audit system fails to detect accounting fraud effectively.

Forensic accounting is a relatively new discipline for practitioners. However, it has become notorious for the rapid increase in scams over the decades. Forensic accounting plays an important role in uncovering hard-to-find fraud through mere internal audits using accounting, auditing, and investigative skills, [15].

H2: Awareness of Forensic Accounting has a significant impact on Intentions of Forensic Accounting

2.6.3 Big Data using and Intentions of Forensic Accounting

Big data techniques can improve the quality and effectiveness of financial statement audits and forensic accounting techniques can help in detecting potential fraud in financial data. By examining transactions and financial patterns, forensic accountants can assist auditors in identifying areas of risk that require further investigation. This data can subsequently be employed in constructing extensive data models specifically designed to identify financial fraud accurately. The significance of collaboration between forensic accountants and data analysts is underscored in the paper, emphasizing the efficient development and utilization of big data models.

In summary, forensic accounting studies suggest an enhancement in big data audits, enabling auditors to create models that enhance fraud detection accuracy through the integration of forensic accounting methodologies. Effective collaboration between forensic accountants and data analysts

remains imperative for proficiently developing and utilizing big data models, [15].

H3: Big Data using has a significant impact on Intentions of Forensic Accounting

2.6.4 COSO and Big Data Using

The COSO framework acknowledges the significance of big data in the realm of risk management by characterizing "risk" as involving "customer relationship management (CRM) or other databases and big data analysis." The application of big data analytics allows for predictive capabilities, aiding organizations in making pivotal decisions. By utilizing diverse sources of big data, organizations can garner valuable insights into organizational risks, facilitating evaluating and mitigating potential hazards.

Employing data science technology with predictive algorithms to analyze extensive datasets alongside risk assessment enables financial institutions to gain immediate, real-time insights into their risks, informing and guiding their risk management strategy. Therefore, big data analytics can be used to improve risk management, and the COSO framework recognizes its importance in managing risk, [15].

H4: COSO has a significant impact on Big Data Analysis

2.6.5 COSO and Intentions of Forensic Accounting

According to, [16], investigate the efficacy of COSO internal control framework in averting occupational fraud within local government organizations. Their findings indicate that COSO internal controls successfully mitigate asset misappropriation and financial statement fraud. The internal control components, encompassing the control environment, risk assessment, control activities, information and communication, and monitoring activities, have proven effective in fraud prevention. Consequently, COSO is anticipated to heighten auditors' inclination to employ forensic accounting to prevent and detect fraud.

In, [16], contend that the internal control system, proper compensation, and competence of the village apparatus serve as deterrents to village fund fraud. The findings suggest that strengthening the internal control system (COSO) effectively prevents fraud. Furthermore, moral sensitivity reinforces the relationship between the effectiveness of village officials in averting village fund fraud, the internal control system, and appropriate compensation.

According to, [16], show that forensic accounting and management control may combat banking cybercrime. The report recommends fraud risk management controls for banks to maintain reputation and regulatory compliance. This proves that the auditor implementing a good control system will prevent the risk of fraud. A good COSO will also increase interest in using forensic accounting to detect fraud.

H5: COSO has a significant impact on Intentions of Forensic Accounting

2.6.6 Mediating effect of Big Data in the relationship between Awareness of Forensic Accounting and Intentions of Forensic Accounting

Awareness of Forensic Accounting has a positive relationship with the intention to use forensic accounting (Intentions of Forensic Accounting) in fraud prevention and detection, [16], [17].

The higher the individual's awareness of forensic accounting, the more positive the correlation with the intention to use the practice. This awareness raises an understanding of forensic accounting's role in detecting financial fraud and irregularities and can drive people to use it to improve professional skills and minimize risk. Ethical considerations in financial reporting also influence an individual's intention to adopt forensic accounting practices, [15], [17].

Big Data Analytics (BDA) serves as a tool for recognizing patterns indicative of fraud, [12], [15]. The integration of BDA into audit processes ensures the enhancement of audit quality and the efficacy of fraud detection, [15], [17]. Forensic accountants are required to possess proficiency in the extraction, analysis, and visualization of data, given the substantial volume, speed, and variety inherent in such datasets, [17].

Big Data Analytics (BDA) functions as a mediator in facilitating the correlation between Advanced Forensic Analytics (AFA) and Investigative Forensic Analytics (IFA) for the purpose of fraud detection, [15], [17]. The application of BDA stands to enhance the efficiency of inspections and investigations within the domain of forensic accounting, [17]. Forensic accountants are equipped to leverage advanced anti-fraud methodologies, including data visualization, predictive analytics, behavioral analysis, content analysis, social network analysis, and geospatial analysis, enabling the

detection of anomalous operations, high-risk areas, and potentially fraudulent activities, [17].
Using big data analysis, forensic accountants can collect, integrate, and analyze data from multiple sources to identify suspicious patterns and trends, [15], [17]. Assist forensic accounting in developing predictive models to detect fraud and fraud, by developing predictive models that can identify suspicious patterns and behaviors and provide early warnings of potential fraud and fraud, [17].
Forensic accountants can utilize predictive modeling and advanced analytics to identify suspicious transactions, high-risk occurrences, and deceptive behavior by analyzing activity data or past transactions. Additionally, forensic accountants can apply entity resolution algorithms to uncover concealed relationships, addresses, and aliases, enabling the examination of conflicts of interest, fraudulent identities, and individuals and businesses subject to sanctions in database data mining, [18].

H6: Big Data Analysis Mediates the Relationship between Awareness of Forensic Accounting on Intentions of Forensic Accounting

2.6.7 Mediating effect of Big Data in the Relationship between COSO and Intentions of Forensic Accounting

Control systems help detect and prevent fraud through policy, surveillance, and data analysis. This can complement forensic accounting efforts in identifying and addressing violations. In addition to early detection, control systems also provide critical data and documentation for forensic investigations, [18].
Forensic accounting, however, continues to be of paramount importance as the last step towards identifying and tackling fraud which has not been identified through control systems. Both make an important contribution to the preservation of organizational integrity and financial soundness, by cooperating in parallel with each other, [18]. The basis for the establishment of effective internal controls is the COSO framework. This framework's structure revolves around monitoring the environment, risk assessment, control activities, information and communication, and monitoring, [13], [18].
The fusion of forensic accounting and corporate governance can enhance internal control. Applying forensic accounting practices to the COSO framework allows organizations to fortify their internal controls and enhance financial reporting processes, [13], [18].
In order to allow auditors to identify patterns and anomalies that might indicate fraudulent activities, BDA could help improve the efficiency of internal controls through real time monitoring and analysis of financial transactions and by analyzing large amounts of data, [15], [18]. BDA can mediate correlations between COSO's internal control framework and forensic accounting objectives by providing real-time monitoring and analysis of financial transactions.
Forensic accounting and internal auditing can use big data analytics to identify and investigate financial fraud, while corporate governance can be strengthened by integrating forensic accounting practices, [19].

H7: Big Data Analysis Mediates the Relationship between COSO on Intentions of Forensic Accounting

3 Research Method

3.1 Data

This research was conducted in 2 large provinces in Indonesia, with the number of respondents in Central Java (Semarang, Solo) being 84% of the total respondents and DIY (Yogyakarta) being 16%, as seen in Figure 3. The reason for selecting the three city locations was because it was based on OJK data in 2022; the highest concentration of fraud checks will be concentrated in these three provinces, [4].

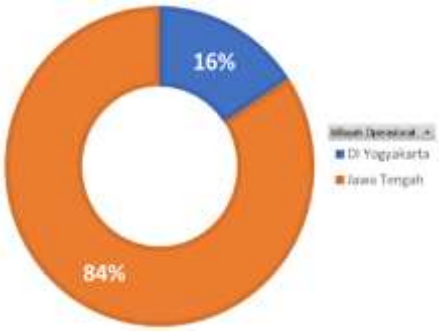

Fig. 1: Composition of Respondents by Region
Source: Elaborated by the Author

This research was undertaken within national auditing institutions, encompassing audit firms (KAP), the Indonesian Supreme Audit Institution (abbreviated nationally as Badan Pemeriksa Keuangan - BPK), and the State Development Audit Agency (abbreviated nationally as Badan Pengawasan Keuangan dan Pembangunan - BPKP).

The first group of respondents to be studied is the condition of the KAP financial statement auditor in 55%, factors that influence auditors using the COSO framework, and the ability of BDA by auditors to detect financial statement fraud. Auditors will be highlighted from the behavioral aspects of awareness using forensic accounting, knowledge, affection, and cognition as well as the attitudes of auditors who have conducted examinations using forensic accounting with the help of BDA. The second group of respondents to be studied in 45% are BPK auditors (Figure 5) who use forensic accounting and BDA in carrying out fraud detection activities and implementing COSO control

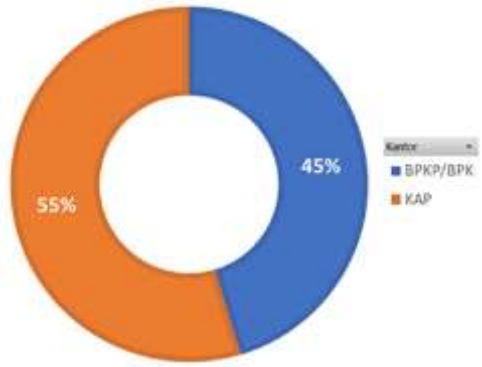

Fig. 5: Origin of Respondent Institution
Source: Elaborated by the Author

The research model proposed in this research can be seen in Figure 4 (Appendix).

3.2 Measures

This study uses primary data as the main input to improve and develop auditor awareness literacy using forensic accounting and BDA in detecting fraud. Primary data were obtained by distributing questionnaires by snowball sampling method, [20], in-depth interviews, and group discussions with auditors in BPK and KAP. Questionnaires are used to obtain data related to factors that affect auditor awareness using forensic accounting for decision-making in preventing and detecting fraud. Interviews with BPK were conducted to explore regulatory policies and enforcement of rules regarding financial statement fraud, while interviews with some KAP respondents were conducted to explore factors that influence decision making to prevent or control and detect fraud. The technical analysis used is descriptive analysis (quantitative and qualitative) with a presentation in the form of tables, narratives, graphs, and charts, [14], [21].
Descriptive analysis is used to obtain a comprehensive picture of financial literacy using SMART PLS (Partial Least Square) analysis, [14], [21]. Research is also combined with aspects of cognition, affection, and conation. Map supporting and inhibiting factors, both internal and external, [20]. This research will also be complemented by qualitative analysis related to emerging aspirations to formulate a model of increasing literacy in the use of forensic accounting in the detection of financial statement fraud and financial fraud literacy in aspects of marketing, social media, and communication.
The data were collected using a questionnaire featuring a five-point Likert scale, where 1 denoted strong disagreement and 5 represented strong agreement. A pilot test was done on Audit Institutions in Indonesia (KAP, BPKP, BPK) before the questionnaires were distributed, to check the clarity of the questions. The findings from the pilot test indicated that every item comprising the research constructs exhibited validity and reliability, as evidenced by Cronbach's alpha coefficients ranging from 0.75 to 0.85 for each construct.

4 Results and Discussion

The questionnaires that came in both from the form and electronic form were 355, after going through the eligibility selection there were 331 respondents' answers that were worthy of being processed in the study. Respondents in this study are Accountants or Auditors who have been assigned to conduct examinations or investigations at a government institutions, SOEs, and private institutions.

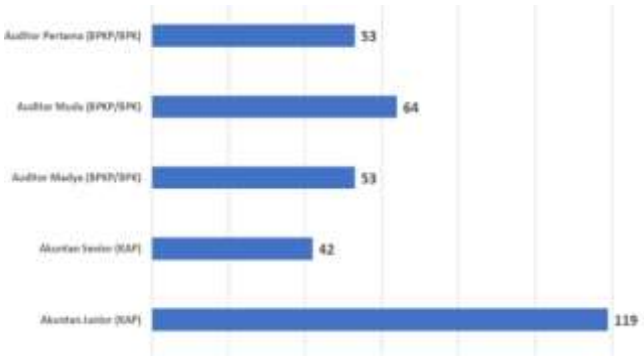

Fig. 2: Respondent Profile Graph by Functional Position

The profile of respondents in this study has various auditor functional positions, consisting of Junior Accountants and Senior Accountants for auditors within the Public Accounting Firm (KAP). Research respondents within BPKP and BPK auditor functional positions consisted of First Auditor, Junior Auditor, and Associate Auditor. Based on

Figure 6, the most respondent profiles based on audit functional positions within KAP are Junior Accountants (110) compared to Senior Accountants who number 42.

This is because in the implementation of audit operations, many are handled by Junior Accountants, while Senior Accountants act as managers and supervisors of audit implementation. In contrast to the profile of respondents in the BPKP / BPK environment, most respondents were those with the functional position of Young Auditor as many as 64 respondents followed by respondents with the functional positions of First Audit and Associate Audit each as many as 53 respondents.

This is because the characteristics of BPKP / BPK respondents are government institutions, where assignments to conduct examinations or audits are mostly carried out by auditors who have middle to upper-functional positions, such as Young Auditors and Associate Auditors.

Figure 7 shows a graph of respondent profiles based on experience in audits, it is known that the most respondent profiles in this study over 10 years are 95 people or 29% of all respondents. This shows that the most respondents have very high flight hours or experience in conducting audit examination activities with forensic accounting in detecting fraud, especially added to the profile of respondents who have experience between 7-10 years as many as 52 people or 16%, and respondents with experience between 4-6 years as many as 62 people or 19% of the total respondents.

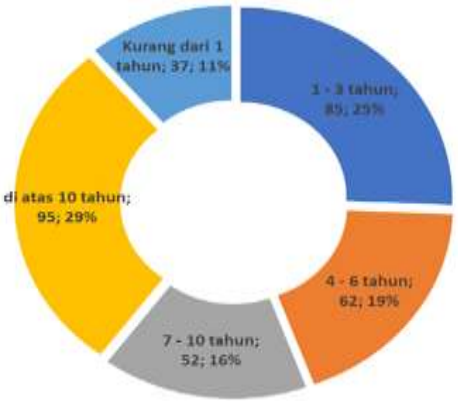

Fig. 3: Graph of respondent profiles by Experience in Audit

Frekuensi/ Unit Audit	Count of Frekuensi	%
1. Very Rare		
BPKP/BPK	59	
KAP	63	
Sub Total	122	37%
2. Rarely		
KAP	3	
Sub Total	3	1%
3. Often		
BPKP/BPK	92	
KAP	95	
Sub Total	187	56%
4. Very Often		
BPKP/BPK	19	
Sub Total	19	6%
Grand Total	331	

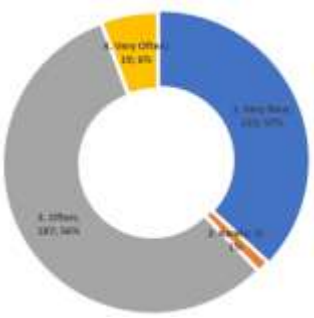

Fig. 4: Respondent Profile Graph Based on Audit Engagement Frequency

Overall, respondents to this study answered that they had received assignments or carried out examination or audit activities with forensic accounting and big data, but how often or frequency they received these tasks can be seen in Figure 8.

The most respondents answered that they often get audit tasks as many as 187 respondents or 56% both within the KAP and BPKP / BPK audit units, while respondents who answered very often as many as 19 respondents or 6% who only exist within the BPKP / BPK only. This shows that research respondents in general often conduct examination or audit activities using forensic accounting and big data analytics to detect fraud. However, some respondents rarely get assignments or carry out examinations or audits, namely as many as 122 people or 37% both within BPKP / BPK and KAP.

1. Distribution of Respondents' Answers Regarding the Awareness of Forensic Accounting (AFA)

Table 1. Respondents' answers related to Awareness Forensic Accounting

	Very Disagree		Disagree		Agree		Very Agree	
AFA1	2	6.0%	0	0.0%	235	71.0%	94	28.4%
AFA2	0	0.0%	0	0.0%	231	69.8%	100	30.2%
AFA3	0	0.0%	2	0.6%	225	68.0%	104	31.4%
AFA4	0	0.0%	2	0.6%	245	74.0%	84	25.4%
AFA5	0	0.0%	2	0.6%	227	68.6%	102	30.8%
AFA6	0	0.0%	0	0.0%	253	76.4%	78	23.6%
AFA7	0	0.0%	0	0.0%	241	72.8%	90	27.2%
						71.5%		**28.1%**

Based on Table 1, respondents generally answered Agree on average as much as 71.5% and Strongly Agree on average as much as 28.1%, the majority of participants indicated a comprehensive comprehension and acknowledgement of the significance of forensic accounting in the identification of fraudulent activities.

2. Distribution of Respondents' Answers Related to Big Data Analytics Perception

Table 1. Distribution of BDA respondents' answers

Indicators	Strongly disagree		Disagree		Agree		Strongly Agree	
BDA1	0	0.0%	6	1.8%	268	81.0%	57	17.2%
BDA2	0	0.0%	6	1.8%	265	80.1%	60	18.1%
BDA3	0	0.0%	5	1.5%	274	82.8%	52	15.7%
BDA4	0	0.0%	4	1.2%	257	77.0%	70	21.1%
BDA5	0	0.0%	6	1.8%	277	83.7%	48	14.5%
BDA6	0	0.0%	3	0.9%	295	89.1%	33	10.0%
BDA7	0	0.0%	14	4.2%	278	84.0%	39	11.8%
BDA8	0	0.0%	6	1.8%	276	83.4%	49	14.8%
				1.9%		**82.6%**		**15.4%**

Based on Table 2, the data distribution of big data analytics among the respondents indicates a comprehensive understanding of the function of big data analytics in facilitating the application of forensic accounting for fraud detection. This can be seen from the answers of respondents who expressed agreement as much as 82.6% and strongly agreed 15.4%, although there are a few respondents who are still not familiar with the role of big data analytics but only 1.9% answered disagree.

3. Distribution of Respondents' Answers to the COSO framework

Table 2. Distribution of respondents' answers about COSO

	Very Disagree		Disagree		Agree		Very Agree	
COSO1	1	0.3%	13	3.9%	167	80.7%	50	15.1%
COSO2	1	0.3%	2	0.6%	251	75.8%	77	23.3%
COSO3	1	0.3%	4	1.2%	265	80.1%	61	18.4%
COSO4	1	0.3%	2	0.6%	283	85.5%	45	13.6%
COSO5	0	0.0%	4	1.2%	248	74.9%	79	23.9%
COSO6	1	0.3%	4	1.2%	243	73.4%	83	25.1%
COSO7	0	0.0%	3	0.9%	266	80.4%	62	18.7%
COSO8	1	0.3%	1	0.3%	244	73.7%	85	25.7%
COSO9	0	0.0%	3	0.9%	261	78.9%	67	20.2%
COSO10	1	0.3%	2	0.6%	265	80.1%	63	19.0%
		0.2%		1.1%		78.4%		20.3%

In general, respondents already understand and apply the COSO framework as an internal control framework when implementing forensic accounting to detect fraud. This can be seen from the answers of respondents (Table 3) who agreed as much as 78.4% and strongly agreed 20.3%, although there were a few respondents who still did not understand the role of the COSO framework but only 1.1% answered disagree and strongly disagree as much as 0.2%.

4. Distribution of Respondents' Answers Related to Intention of Forensic Accounting

Table 3. Distribution of respondents' answers intention of forensic accounting

	Very Disagree		Disagree		Agree		Very Agree	
IFA1	0	0.0%	2	0.6%	287	86.7%	42	12.7%
IFA2	0	0.0%	2	0.6%	273	82.5%	56	16.9%
IFA3	0	0.0%	2	0.6%	258	77.9%	71	21.5%
IFA4	1	0.3%	9	2.7%	272	82.2%	49	14.8%
		0.1%		**1.1%**		**82.3%**		**16.5%**

With strong intentions and a general willingness to use forensic accounting techniques to prevent and detect fraud, the majority of respondents indicated. This can be seen from the answers of respondents (Table 4) who expressed agreement with as much as 82.3% and strongly agreed 16.5%, although there were a few respondents who were still not willing and intended to use forensic accounting techniques, namely only 1.2% who answered disagree and strongly disagree as much as 0.1%.

4.1 Measurement Model Evaluation Results

4.1.1 Internal Consistency and Reliability

Internal consistency and reliability are two important indicators that are evaluated in research studies. These indicators help to determine whether the variables in the scale converge to a single latent structure. Cronbach's Alpha and Composite Reliability assess internal consistency and reliability. Cronbach's Alpha over 0.7 indicates scale dependability. In Table 5, all components meet the 0.7 criteria, suggesting discriminant validity for all constructs. Referring to, [22], we also checked the cross-factor loading values and the Heterotrait-monotrait ratio (HTMT) criterion and the results were also similar. Thus, the discriminant validity of the constructs is assured.

Table 4. Reliability and convergence value evaluation results

Variable	AVE	CR	Cronbach`s Alpha
AFA	0.677	0.936	0.920
COSO	0.544	0.892	0.858
BDA	0.660	0.951	0.942
IFA	0.574	0.842	0.751

4.2 Convergent Validity

Convergent validity requires an average variance extracted (AVE) of 0.5 for each latent variable, according to, [29]. The latent variable can explain over half of its indicators' variance. Latent variables with AVEs below 0.5 should be removed from the study model. The data processing results in Table 5 reveal that the AVE values for all scales are higher than the minimum criterion of 0.5. Therefore, all

nine research variables have strong convergent validity.

In addition, the convergence value is calculated using the observed variables' external load coefficients and average extracted variance. The observed variables' external stress coefficient must be 0.708 or higher to be statistically significant. It means the outcome variables will measure the observed variable's dependability.

The results in Table 6 demonstrate that the external load coefficient of the observed variables must be at least 0.708 and statistically significant. Therefore, the variables in the model satisfy the convergence value criteria.

4.3 Evaluation of the Structural Model PLS-SEM

According to, [23], study, the criteria considered to evaluate the reference structure model. The PLS-SEM method is used to evaluate different factors and their importance. The evaluation of the measurement model includes assessing the fit of the model, measuring the R2 coefficient, and testing the research hypothesis by the path coefficient and T-value. The PLS-SEM bootstrapping sample size of N = 5000 is used to test the consistent thesis. The proposed hypotheses' p-values < 1%, 5%, and 10% are considered statistically significant at 99%, 95%, and 90% confidence. From the estimation results, the evaluation results of the PLS-SEM structural model are as follows:

4.3.1 Evaluate Collinearity in the Structural Model

Table 3 shows all predictors' VIF (Variance Inflation Factor) values (Outer VIF Values) below threshold 5. Therefore, collinearity between predictors is acceptable in the structural model and can be continued.

4.3.2 Model Fit Assessment

The Standard root mean square residual (SRMR) is a measure of how well a model fits the data. It is calculated by comparing the model's predictions with the actual data. A value of 0 means a perfect fit, and a value less than 0.05 is considered good. However, for PLS path models, a value less than 0.08 is more appropriate. The results of Table 8 show that the SRMR values are almost less than or equal to 0.1, which means that the model is suitable for the dataset.

Table 5. External load coefficients of observed variables

Variables	Indicator	Outer Loading	Information
Awareness Forensic Accounting	can be used to analyze financial statements **(AF1)**	0.781	Valid
	very important to use in fraud detection **(AF2)**	0.855	Valid
	can be used to identify misuse of assets **(AF3)**	0.796	Valid
	can make financial data or information more reliable and accurate **(AF4)**	0.875	Valid
	ensure compliance with applicable laws and regulations **(AF5)**	0.814	Valid
	be able to evaluate the corporate governance system **(AF6)**	0.870	Valid
	be able to evaluate internal control **(AF7)**	0.760	Valid
Internal Control (COSO)	always use Forensic Accounting techniques or methods to detect fraud (**COS1**)	0.678	Valid
	senior management sets a good example in supporting and implementing internal control (**COS2**)	0.898	Valid
	identification and evaluation of fraud risks that may occur within the organization being audited **(COS3)**	0.816	Valid
	using a risk-based approach in audit planning and execution **(COS4)**	0.871	Valid
	systematically evaluate the design, implementation, and effectiveness of internal controls **(COS5)**	0.786	Valid
	inspect and test information systems **(COS6)**	0.798	Valid
	ensure that information regarding internal controls and fraud-related policies is communicated to company management **(COS7)**	0.777	Valid
	ensure that reports of fraud or indications of fraud are communicated appropriately and in a timely **manner (COS8)**	0.864	Valid
	monitor and supervise regularly the implementation of internal control to detect fraud **(COS9)**	0.842	Valid
	routine internal checks to evaluate the effectiveness of internal controls related to fraud detection **(COS10)**	0.898	Valid
Big Data Analytics	can analyze data to detect fraud in *real-time* **(BG1)**	0.846	Valid
	provides advanced social network analysis, data visualization, and analysis algorithms **(BG2)**	0.750	Valid
	provides powerful and high-quality and cost-effective processing in Forensic accounting to detect fraud **(BG3)**	0.757	Valid
	Provides high-speed data processing **(BG4)**	0.766	Valid

Variables	Indicator	Outer Loading	Information
	is very familiar used in Forensic Accounting to detect fraud **(BG5)**	0.661	Valid
	make a significant contribution to the use of Forensic Accounting to detect fraud **(BG6)**	0.656	Valid
	confidence can improve the reliability of forensic accounting results for fraud detection **(BG8)**	0.708	Valid
Intention to Use Forensic Accounting	I am interested in using Forensic Accounting to detect fraud **(NAF1)**	0.783	Valid
	I prioritize compliance needs when using Forensic Accounting to detect fraud **(NAF2)**	0.629	Valid
	I prioritize risk identification, analysis, and control more when using Forensic Accounting to detect fraud **(NAF3)**	0.858	Valid
	I will always use Forensic Accounting techniques or methods to detect fraud **(NAF4)**	0.743	Valid

4.3.3 Test the Predictive Level of the Structural Model (R^2)

The results in Table 7 show that the explanatory level of the adjusted R^2 is quite strong, [22]. The explanatory level of factors affecting business performance (BP) is 63.5 (corresponding to an adjusted R^2 of 62.5). Thus, to sum up, the independent variable that explain 62.5% of the research dependent variable is the business performance of enterprises. This result is considered quite well.

Table 6. Results of the VIF index of the model's predictor

	AFA	BDA	COSO	IFA
AFA		1.436		1.634
BDA				1.861
COSO		1.436		1.803
IFA				

Table 7. Evaluation of model fit

Variable	Value
R Square	
Big Data Analytics	0,463
Intentions Forensic Accounting	0,591
SRMR	0,095
NFI	0,613

According to the data presented in Table 8, the R Square values for both Big Data Analytics variables and Intentions in Forensic Accounting fall above 0.25 and below 0.65. It suggests that the structural model of this study aligns with medium criteria, indicating a moderate level of influence of the independent variable on the dependent variable. The estimated outer model SRMR value is 0.095, which means that the research model is included in the Goodness of Fit criteria because it is in the range between 0.08 to 0.10.

To see the impact of the independent variables on the dependent variable in the model, we consider the path coefficient and the coefficient f2. As described in chapter 3, the coefficient f2 indicates the degree of influence of the variable when removed from the model. If $f2 > 0$, the independent variable has a potentially suitable prediction for the dependent variable. Corresponding to a coefficient f equal to 0.02 is the low probability, 0.15 is the medium probability and 0.35 is the high probability. The influence coefficient f2 is shown in Table 9 indicating that the explanatory level of the independent variables for the dependent variable is relatively low.

Table 8. Results of the coefficient f square

	AFA	BDA	COSO	IFA
AFA		0.138		0.121
BDA				0.145
COSO		0.255		0.112
IFA				

4.4 Results of Testing the Research Hypothesis

This study's seven hypothesized causal relationships were statistically verified to exhibit a positive impact. The inner model testing results, encompassing R-Square, path coefficient, and T-statistics, were utilized for hypothesis testing. The significance values between constructs are evident in the T-statistics and P-Values obtained via bootstrapping testing with the SmartPLS 4.0 package. A significance level of 5% ($P = 0.05$) and a positive beta coefficient ($T = 1.96$) are the criteria utilized in this study.

Table 10 shows that H1, H2, H3, H4, and H5, are accepted (value of $p < 0.05$), i.e., variables *AW_FORAC*, *BDA*, *COSO* all have a positive impact on the Intentions of Forensic Accounting (INT_FORAC). Table 11 shows that the research hypotheses from H6 and H7 are accepted (p-value < 0.05), i.e., variables *AW_FORAC* through *BDA* have a positive impact on Intentions of Forensic Accounting (*INT_FORAC*). Also, variables *COSO*

through *BDA* have a positive impact on Intentions of Forensic Accounting (*INT_FORAC*).

Table 9. Results of model hypothesis testing

		Estimate	Stdev	t-Statistics	P Value	R Square
H1	*AW_FORAC-> BDA*	0.326	0.075	4.321	0.000	0.463
H2	*AW_FORAC-> INT_ FORAC*	0.284	0.070	4.074	0.000	
H3	*BDA -> INT_FORAC*	0.332	0.082	4.045	0.000	0.591
H4	*COSO -> BDA*	0.444	0.050	8.799	0.000	
H5	*COSO -> INT_FORAC*	0.287	0.068	4.258	0.000	

Table 10. Specific indirect effect

		Specific Indirect Effects	P-Values
H6	*AW_FORAC-> BDA-> INT_FORAC*	0.108	0.000
H7	*COSO -> BDA-> INT_FORAC*	0.148	0.000

Based on the indirect effects table in Table 11, it can be concluded that:

1. The indirect influence *of AW_FORAC* on *INT_FORAC* through BDA is 0.108 which means that if *AW_FORAC* increases by one unit then INT_FORAC can increase indirectly through by BDA by 10.8%. This influence is positive.
2. The indirect influence of COSO on *INT_FORAC* through *BDA* is 0.148 which means that if *COSO* increases by one unit then *INT_FORAC* can increase indirectly through *BDA* by 14.8%. This influence is positive.

Table 11. Total effect

	AW_FORAC	BIG DATA_ ANALY	COSO	INTENT_ FORACC
AW_FORACC		0.326		0.393
BIGDA_ANALY				0.332
COSO		0.444		0.435
INTENT_FORAC				

Based on Table 12, it can be concluded as follows:

1. The effect *of AW_FORAC* on *INT_FORAC* through *BDA* is 0.393 which means that if one-unit increases, *INTENT_FORAC can increase directly and indirectly* through *BDA* by 39.3%. This influence is positive.
2. The effect of *COSO on INT_FORAC* through *BDA is* 0.435 which means that if *COSO* increases by one unit then *INT_FORAC can* increase directly and indirectly through *BDA* by 43.5%. This influence is positive.

5 Discussion

Hypothesis 1 testing proves that Awareness of Forensic Accounting influences Big Data. Increasing awareness of the use of forensic accounting will cause auditors to need complex and integrated big data.

In the validity test table, the AF4 indicator exhibits the highest outer loading or correlation value of 0.875, indicating that awareness-based forensic accounting has the potential to enhance the dependability and precision of financial data or information. Auditors and examiners feel the importance of using Big Data to work quickly and find more fraud and can make financial information more reliable and accurate. Auditors use big data techniques when dealing with the complexity of commercial transactions to uncover fraudulent transactions. Forensic accountants can apply various advanced anti-fraud techniques by increasing the use of big data such as data visualization, predictive analysis, behavioral analysis, geo-spatial analysis to identify fraudulent activities. The results of this research support, [14], and, [18], which states that forensic accounting awareness can increase the use of big data technology to detect fraud.

Testing hypothesis 2 proves that Awareness Forensic Accounting *(AW_FORAC*) influences the Intention to use Forensic Accounting *(INT_FORAC).* to detect fraud. Practitioners who have a higher level of forensic accounting awareness will be more willing to apply forensic accounting for fraud detection.

In the validity test table, it can be seen that the AF4 indicator has the highest outer loading or correlation value, namely 0.875, which shows that Awareness Forensic Accounting can make financial data or information more reliable and accurate because examiners or auditors prioritize risk identification and analysis to detect fraud. The results of this research support, [17], and, [18], which states that awareness of forensic accounting plays an important role in increasing the intention to use forensic accounting in uncovering complicated fraud through audits, accounting and investigative skills.

Testing hypothesis 3 establishes the influence of Big Data utilization on the Intentions of Forensic Accounting. The application of big data techniques

has the potential to enhance the quality and effectiveness of financial report audits and contribute to the advancement of forensic accounting methods for detecting potential fraud within financial data.

The validity test table indicates that the BG1 indicator exhibits the highest outer loading or correlation value of 0.846, signifying the capability of Big Data to analyze data and identify fraud in real time. Therefore, using big data for real-time fraud detection can further amplify the intention to employ forensic accounting. By using big data models that can identify financial fraud more precisely, auditors have a higher intention to use forensic accounting to identify risk areas that require further investigation.
The results of this research support, [19], which states that big data models can be used efficiently if auditors increase their interest in collaborating on the use of forensic accounting with data analysts.

Testing hypothesis 4 proves that COSO influences the use of Big Data. The COSO framework for risk detection requires big data to predict and help businesses make important decisions. In the validity test table, it can be seen that the COS2 indicator has the highest outer loading or correlation value of 0.898, which shows that senior management provides a good example in the implementation of internal control so that with good internal control support it allows auditors to use specific big data to detect and prevent the risk of fraud.

In order to implement risk management strategies, financial institutions acquire real-time insight into potential hazards by utilizing big data technology that integrates risk assessment with predictive algorithms for big data analysis. The results of this research support, [20] which states that risk management can be more effective by using the COSO framework and big data.

Testing hypothesis 5 proves that COSO influences the Intentions of Forensic Accounting. Internal control components (COSO), including risk assessment, control activities, information and communication, as well as monitoring activities, have been proven to be effective in preventing fraud. So, the use of COSO will increase the interest of auditors or examiners in using forensic accounting to prevent and detect fraud, [24].

In the validity test table, it can be seen that the COS2 indicator has the highest outer loading or correlation value of 0.898, which shows that senior management at KAP, BPKP, BPK provides an example of implementing effective internal control thereby increasing the interest of auditors or examiners in using forensic accounting in finding more fraud. The results of this research support, [20], [18], and, [25], which prove the effectiveness of the internal control framework in preventing work fraud in local government organizations.

Hypothesis H6 testing proves access to Awareness of Forensic Accounting (*AW_FORAC*) through Big Data Analysis (*BDA*) has the most significant influence on intentions of Forensic Accounting (*INT_FORAC*). This result is similar to the studies of, [18], [26].
BDA can be used to increase the effectiveness of inspections and investigations in forensic accounting. Big data with its volume, velocity, and variety of data offers many sources of evidence. Forensic Accountants with Big Data can extract, visualize, and analyze data originating from various sources. Apart from that, auditors can also identify suspicious patterns and trends using Big Data. Auditors utilize Entity resolution algorithms and data mining databases to detect hidden relationships, forged addresses, conflicts of interest, and false identities.
However, most KAPs still haven't maximized the use of Big Data due to the limited availability of the data being examined. Meanwhile, BPK and BPKP have used Big Data a lot because the data is centralized so data availability and data access can be obtained easily. In addition, there are government regulations and The Financial Services Authority (OJK) that require related companies and audited clients to disclose and provide their data if requested by the BPK and BPKP. The Financial Services Authority (OJK) is a trustworthy monitoring institution that oversees the financial services industry in Indonesia.
Hypothesis H7 testing proves that the indirect influence of *COSO* through Big Data Analysis (*BDA*) is the most critical factor affecting the intentions of Forensic Accounting (*INT_FORAC*). This result is similar to the studies of, [19], [27], [28], [29].
By incorporating forensic accounting practices into the COSO framework, organizations can strengthen their internal controls and improve their financial reporting processes. BDA can enhance the efficacy of internal control by monitoring and analyzing financial transactions in real-time. Auditors can use Big Data to evaluate and analyze large amounts of data so that the auditor can identify data patterns and anomalies that can be identified as fraudulent activity. The role of BPK and BPKP in internal control with COSO to use forensic accounting is very large.
The Constitution of the Republic of Indonesia mandates the roles of the BPK and BPKP. The BPK's primary role is to audit and supervise the

local and central government finance, acting as national external auditors. The BPKP's role is to perform audits, evaluations, reviews, and monitoring of asset utilization and financial planning belonging to local and central governments, concerned with financial and operational terms, and focused on performance measurement. The BPKP and internal control systems are intricately intertwined in strategy formulation and implementation. Further provisions regarding the BPK are regulated by law. The BPK is not responsible for financial management, but it plays a role as an external auditor to improve public financial management. The BPK's roles and functions have strengthened since the third amendment of the 1945 Constitution in 2001. The Indonesian Constitution of 1945 has been reinstated in 1959 and revised in 2002. The BPK is one of the main actors in the Indonesian health system, along with the Badan Pemeriksa Keuangan (Supreme Audit Agency) or BPK

6 Managerial Policy Implications

From the research results, some policy implications are proposed for state agencies. This research found interesting evidence. The empirical evidence presented in our study assists scholars and consumers in assessing the level of complexity demonstrated by internal control frameworks designed to prevent fraud. Internal controls are not universally effective in preventing all forms of fraud within firms, particularly in instances involving corruption.

The organization takes the existence of a conspiracy orchestrated by a powerful group extremely seriously; consequently, internal control will be rendered less effective, [29] [30]. Meanwhile, the organization's internal control makes it very easy to prevent fraud related to technical tasks. So, it is necessary to design additional measures from existing COSO guidelines to appropriately address the risk of corruption fraud, [31] .

This has theoretical implications for managerial organizations. There are several alternative mechanisms for implementing controls related to the use of Big Data such as "regular staff rotation" and "fraud awareness training" as well as increasing the use of big data to get evidence findings quickly and in real-time. By implementing this measure, businesses can establish a highly ethical environment and gain control over financial and human resource deception. Some elements facilitate the execution of internal control, such as establishing a mechanism for reporting misconduct. Auditors can highlight the mechanisms for implementing controls and Big Data using on their audited clients.

7 Conclusion

The study identifies key attributes influencing the intention to detect fraud in forensic accounting. Big Data and awareness of forensic accounting play pivotal roles. Seven hypotheses were posited, establishing the significant impact of Forensic Accounting Awareness on Big Data Analysis, the substantial influence of Big Data Analysis on Intentions in Forensic Accounting, the impactful relationship between COSO and Big Data Analysis, the consequential effect of COSO on Intentions in Forensic Accounting, and the mediating role of Big Data Analysis in the relationship between COSO and forensic accounting intentions. Statistical support is found for the seventh hypothesis.

This study provides empirical evidence that a resilient internal control system reduces the likelihood of fraudulent activities. Effective internal controls require an organization to comprehensively understand the most susceptible risks and the appropriate course of action to address fraudulent activities. It is imperative for organizations to methodically integrate components for identifying, assessing, and responding to fraud risk.

This approach facilitates the incorporation of anti-fraud measures into risk management initiatives, establishing a systematic approach to document acquired knowledge for guiding future endeavors in detection or mitigation. Big Data is an indispensable tool for the continuous and timely accumulation of evidence and data to analyze trends over time to identify misconduct instances.

8 Limitation and Future Research

The limitation of this research is that the scope or object of research is auditors in Indonesia, so it may not necessarily be applicable in other countries with different cultures and regulations. In addition, this research has not been in-depth in identifying barriers and opportunities for using forensic accounting, big data, and the COSO framework to detect fraud. It is necessary to conduct in-depth follow-up research with qualitative methods from the results of auditor interviews.

Based on the results of this study, the researcher provides suggestions for future research, such as (1) Conduct further research to delve into auditors'

understanding of the use of forensic accounting in fraud detection. Focus on how this awareness can be enhanced and applied more effectively in audit practices. (2) Deepen the role of big data analysis (BDA) in supporting forensic accounting activities. Research can explore specific BDA techniques that are most effective in detecting fraud indications and identify barriers and opportunities that may arise in its implementation. (3) Explore the impact of implementing the Committee of Sponsoring Organizations (COSO) model in preventing and detecting fraud in other industry sectors. Focus on different sectors to gain further insights into the effectiveness of the COSO model outside the banking sector, such as manufacturing or services industries. (4) Build an integrated framework that combines aspects of forensic accounting, big data analysis, and the COSO model. Research can evaluate how this integration can be applied by internal and external auditors to enhance efficiency in fraud detection.

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APPENDIX

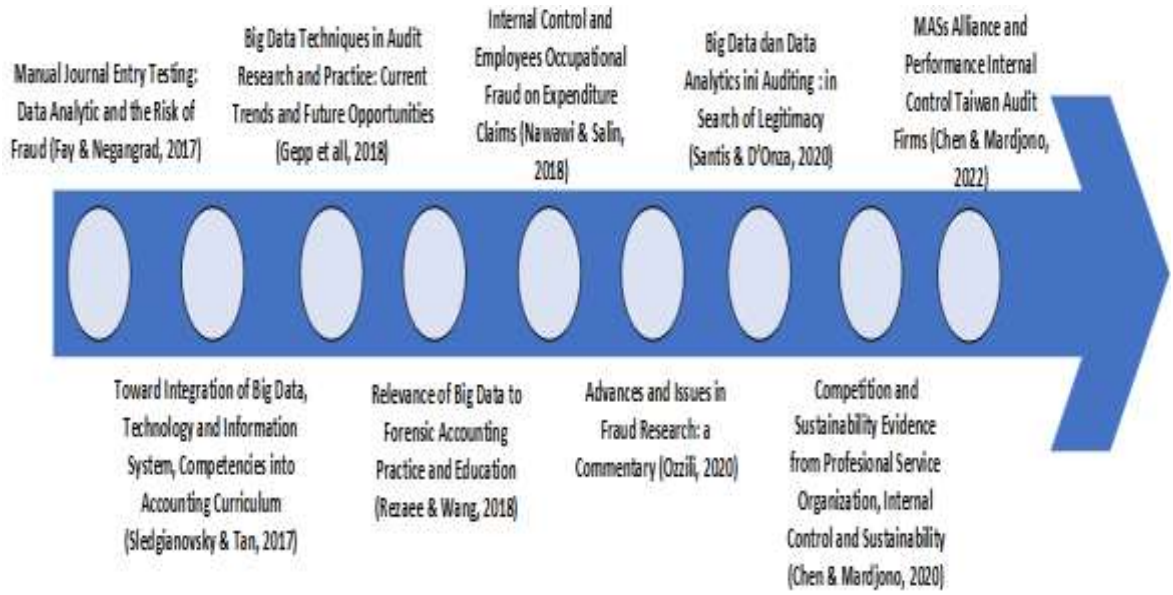

Fig. 1: Roadmap for Research Variables: Big Data, Internal control, and Interest in using Forensic Accounting for Fraud Detection

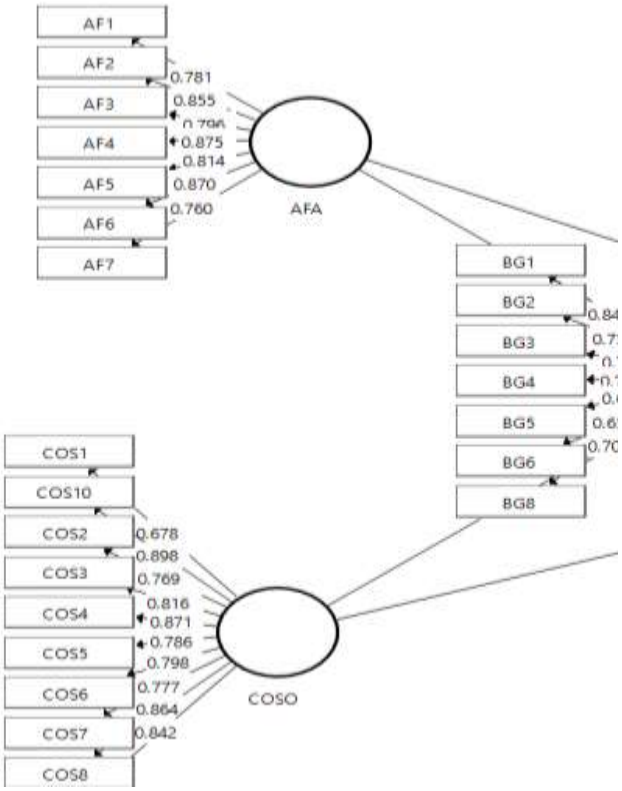

Fig. 4: Full model

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- Enny Susilowati Mardjono: Conceptualization, Investigation, Supervision, Writing – original draft, Formal analysis, Review & editing.
- Entot Suhartono: Data curation, Methodology, Funding acquisition, Writing – review & editing.
- Guruh Taufan: Software, Writing – review & editing.

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Conflict of Interest

The authors have no conflicts of interest to declare.