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DIGITAL FORENSICS: THE USE OF POLYGRAPHS IN PROVING TRUTH IN AUDIT CASES

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ABSTRACT

This article has five main objectives: 1) Polygraph Validity, 2) Ethical Use of Polygraph, 3) Legal Considerations, 4) Data Security, and 5) Polygraph Comparison with other methods, including Limitations. There is still a lack of understanding and studies related to using polygraphs in proving the truth in audit cases, such as in the case of the murder of fellow police officers, allegedly masterminded by their leaders. The research method used is a qualitative descriptive method. This study analyzed the literature review by collecting articles related to the keywords: Digital Forensics, Polygraph, and Proof of Audit Obfuscation. Articles were searched from Science Direct, Taylor & Francis, Emerald, and Google Scholar. Research results show that polygraph validity is still much debated because it is not always reliable and can be influenced by factors like subject anxiety, examiner expertise, and the subject's ability to control physiological responses. Ethical and legal considerations, including laws in Indonesia, and data security must ensure confidentiality. The use of polygraphs in digital forensic audits raises potential to increase the validity and reliability of digital evidence. Despite this potential, challenges such as ethical aspects, data security, and polygraph technology limitations must be considered.

Keywords: Digital Forensics; Polygraph; Law

INTRODUCTION

The mass media and social media continue to discuss the level of accuracy and trust in the use of lie detector test results, known as polygraphs, for perpetrators and/or those suspected of being involved in the planned murder of fellow police officers, allegedly masterminded by their leaders.

According to (Tempo.co, Jakarta 2022) Head of Forensic Computer Affairs Polygraph Expert Aji Febriyanto Arrosyid who testified in a trial at the South Jakarta District Court, Wednesday, December 14, 2022. In his testimony, Aji stated that he conducted an examination of the defendants in the murder of Joshua. As a result, Ferdy Sambo and Putri Candrawathi were indicated as lying. "Mr. Ferdy Sambo has a total score of -8, Putri -25. Strong Ma'ruf was examined twice, the first time the result was +9 and the second -13, Ricky twice also first +11, second +19, Richard +13," said Aji. Aji explained that a plus score indicates honest results, while a minus indicates that the examiner lied. The judge also emphasized these values. "What is the indication for Sambo?" said the judge. "Minus, indicated lying. If PC is indicated to lie. If Strong, honest and indicated lying," said Aji.

Digital forensics is an essential element in uncovering the truth in an era where information technology forms the very foundation of business activity and human interaction. In the context of auditing, the ability to ensure the validity and integrity of digital data is becoming increasingly vital. In an effort to improve the accuracy and effectiveness of digital forensics, innovative approaches such as the use of polygraphs are the focus of attention. (Hinkle 2021).

Polygraphs, previously widely recognized in the context of lie detection, are now being explored for application in digital forensics, particularly in audit cases. This approach raises profound questions about its reliability and relevance in the face of complex challenges associated with the digital world. Therefore, this study aims to investigate the extent to which the use of polygraphs can prove truthfulness in digital audit cases. (Mallow 2020).

In addressing this challenge, the research will explore the validity of polygraph technology as a digital forensic tool and explore the possibility of its integration in the audit process. In this context, ethical considerations, data security, and user readiness will be crucial factors that will be evaluated to ensure the application of polygraphs makes a positive contribution to the reliability of digital evidence in audit forensics.

The successful use of polygraphs in digital forensics lies not only in their technical validity but also in a deep understanding of the ethical aspects involved. Individual privacy rights and data protection are essential considerations that must be integrated in the use of this technology. Therefore, this research not only aims to measure the

reliability of the polygraph as a detection tool, but also to understand the ethical and legal impacts that may arise from its application in the context of digital auditing.

By bridging the gap between technology, ethics, and forensic auditing needs, this research is expected to contribute valuable insights to digital forensics practitioners, auditors, and related stakeholders. Through these steps, we can pave the way towards the development of more advanced audit methodologies, ensuring the integrity of digital data that is increasingly important in the ever-evolving information ecosystem.

In the next phase, this research will detail the methodology to be applied to test and evaluate the validity of polygraph technology in the context of forensic auditing. Case studies that include simulated digital audit situations will provide deep insight into the effectiveness of polygraphs in detecting significant changes in electronic data.

LITERATURE REVIEW

Based on books and studies that have been done before, to get a clear understanding of the concepts in this study, the literature review section is divided into three main discussions: first, Digital Forensics; second, Polygraph; third, proving the truth of audit cases.

Digital Forensics

Digital forensics is a discipline that involves using scientific methodologies to collect, analyze, and present data from digital devices for use in a legal context, such as in a court case. This process often involves working with computer hardware and software, as well as data stored in electronic form, to identify, recover and analyze information that may be relevant to the investigation of a crime or legal dispute. (Turlik 1981).

Digital forensic experts must ensure that the evidence collected is maintained in its integrity, so that it can be relied upon in legal proceedings. This includes ensuring that evidence is not altered, damaged or lost during the collection and analysis process. They must also comply with applicable laws and ethical standards, and use proven tools and techniques to maintain a proper chain of custody. (Turlik 1981).

Digital forensics can be applied in various cases, including but not limited to, cybercrime, identity theft, fraud, child pornography, and copyright infringement. With the rise of cybercrime and the use of technology in everyday life, the need for digital forensic experts has also increased(Turlik 1981).

Polygraph

A polygraph, often referred to as a "lie detector," is a device designed to measure and record a person's physiological responses while answering a series of questions. It is based on the assumption that lying can cause stress which then triggers changes in several physiological parameters of the body, such as heart rate, blood pressure, respiratory frequency, and sweat gland activity (Turlik 1981).(Turlik 1981).

A classic polygraph records cardiovascular activity (such as heart rate), thoracic and abdominal respiration, galvanic skin response (also known as electrodermal activity or EDA), and tremor. During a polygraph examination, an examiner will ask the examinee questions and receive "yes" or "no" answers from them. The results of this examination are then analyzed by the examiner to determine whether the answers given are truthful or not. (Asonov et al. 2023).

However, the accuracy of polygraphs has been a subject of debate in scientific and legal circles. Some studies suggest that while polygraph can be useful in some situations, it is also prone to error, both due to the method itself and due to human error, such as examiner bias (Asonov et al. 2023).

Therefore, the use of polygraphs in legal contexts, such as in criminal evidentiary proceedings, is often debated and strictly regulated in various jurisdictions. (Lovina 2020).

Audit lie-detector

Falsehood proof in the context of auditing refers to the process of verifying and validating the information presented by the audited entity to ensure that the information is accurate and not misleading. Auditors use various techniques and procedures to detect inaccuracies or manipulations in financial statements and accounting records. These include analysis of financial ratios, testing of transactions and account balances, and examination of supporting documentation.

In some cases, auditors may also use tools such as polygraphs or other lie detection technologies to assess the honesty of individuals involved in the audit process, although the use of such tools is not common and may raise questions of ethics and legality. (Aristiani and Layang 2022)..

More often, auditors rely on their professional knowledge, professional skepticism, and experience to identify signs of lies or fraud.

Proving falsity in an audit also involves understanding human behavior and patterns that may indicate fraud or error. Auditors should pay

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attention to red flags or indicators that may indicate the risk of fraud, such as sudden changes in management behavior, pressure to achieve certain financial targets, or unusual transactions that occur towards the end of the reporting period. (Amsel 2017).

RESEARCH METHODS

The research method used is a qualitative descriptive method. In this study, the analysis was carried out using literature review analysis by collecting articles related to the keywords that have been determined. The keywords set are Digital Forensics, Polygraph and Proof of Audit Obfuscation. Articles related to the predetermined keywords were searched from Science Direct, Taylor & Francis, Emerald, Google Scholar and others. The criteria for articles selected were articles that explicitly had these keywords in their titles, totaling 100 articles.

After this article was obtained, a discussion of Polygraph Validity was sought; second, Ethics of Polygraph Use; third, Legal Considerations; fourth, Data Security; fifth, Polygraph Comparison with other methods; sixth, Limitations of Polygraph.

Findings and Discussion

Based on the objectives that have been set in this study, the discussion of the study is divided into 5 (Five) parts obtained from literature analysis. First, Polygraph Validity; second, Ethical and Legal Considerations for the Use of Polygraph; third, Data Security; fourth,; Polygraph Comparison with other methods fifth,; Limitations of Polygraph.

Polygraph Validity

The validity of polygraph as a lie detector has been the subject of a long debate in scientific and legal circles. Although polygraphs have been used for almost a century, many courts still reject polygraph examination results as evidence due to their questionable level of validity. The main reason for this rejection is that polygraph results are not always reliable and can be affected by a variety of factors, including the subject's anxiety, the examiner's expertise, and the subject's ability to control his or her physiological responses. (Lovina 2020).

In addition, the results of the polygraph examination are not considered as the main evidence in the trial and require an analysis of forensic psychology expert testimony explaining the content of the graphic image analysis of the polygraph results.

Therefore, although polygraphs can provide additional information in investigations, their reliability as a lie detector is questionable and is not considered strong enough to serve as a definitive legal evidentiary basis. (Gołaszewski, Zajac, and Widacki 2015)

However, critics point out that these physiological responses are not specific to lying and can be affected by a variety of other factors, such as anxiety, fear, or other emotional states (Babu Rajan 2018)

Research has shown that there is no unique physiological response to lying, making it difficult to determine with certainty whether someone is lying based solely on their physiological responses (Amsel 2017). In addition, the interpretation of polygraph results is highly subjective and relies on the expertise of the examiner (Admissibility et al. 1971). (Admissibility et al. 1971) .

Nonetheless, some studies have tried to improve the reliability of lie detection by integrating polygraph testing with other methods, such as facial micro-expression analysis or involuntary voice modulation, but these approaches are still in the research stage and have not been widely accepted in the scientific community (Asonov et al. 2023). (Asonov et al. 2023)..

Ethical and Legal Considerations of Polygraph Use

The use of polygraphs in legal proceedings raises various ethical questions, particularly in relation to human rights and fair trial principles. One of the main concerns is that polygraphs may violate the right to silence, which is part of human rights and is recognized in various legal systems.(Simpsons, Simpson, and Detector 1921). . This right to silence allows a person not to give information that could prejudice themselves in court, which is also known as the principle of non-self incrimination.

In addition, the use of polygraph may affect the presumption of innocence, as it relies on changes in physiological reactions that may be interpreted as indications of lying, thus influencing the perception of a person's guilt prior to a valid legal decision.

This can undermine everyone's right to be presumed and treated as innocent until proven otherwise.

Polygraph examinations can also affect a person's right to testify freely, as the physiological responses measured by a polygraph can be influenced by factors other than lying, such as anxiety or psychological distress, which are not

necessarily related to the truth of the statements made.

From a legal perspective, polygraph examination results are not always considered as primary evidence in a trial and must be supported by expert forensic psychology analysis to ensure accuracy and objectivity.

However, the Criminal Procedure Code does not explicitly regulate the qualifications of experts who must be presented at trial, so there is uncertainty about the standards that must be met by these experts. (Aristiani and Layang 2022).

Pay attention to ethical and legal aspects when using polygraph. Some ethical considerations to be aware of include:

1. Right to Silence: The use of polygraphs can be considered a violation of the right to silence, as it can force a person to provide information that they may not want to share. (Zabcikova, Koudelkova, and Jasek 2022)
2. Presumption of Innocence: Polygraphs can create a bias against the presumption of innocence if test results are falsely interpreted as evidence of guilt (Ayoub et al. 2018)
3. Anxiety and Psychological Stress: Polygraphs may not be able to distinguish between lies and physiological reactions caused by factors such as anxiety or psychological stress, which can affect the test results. (Talaat 2023)
4. Use of Test Results: Polygraph results should be treated with caution in legal proceedings and should not be considered as conclusive evidence without support from other evidence. (Widacki and Szuba-Boroń 2017).
5. Expert Qualifications: In a trial, it is important to ensure that the expert analyzing the polygraph results is appropriately qualified and can provide an objective assessment. (Lovina 2020).
6. Impact on Human Rights: There are concerns that the use of polygraphs may have a negative impact on human rights, including the potential distortion of test results. (Lovina 2020).

In a practical context, research and development continues to seek more accurate and ethical methods of lie detection, including the use of Vibraimage technology as a supplement to the standard polygraph inspection procedure. (Kwan et al. n.d.)

However, it is important to continue to evaluate the reliability and application of these new technologies in legal practice (Необходимости et al. 2015) .

Data Security

Data security in the context of polygraph use is critical, given the sensitivity of the information generated during the examination. The data obtained from a polygraph test includes physiological responses of the subject that may reveal personal and sensitive information. Therefore, the protection of this data must comply with applicable regulations and strict security standards to prevent unauthorized access or misuse of the information.

In the context of Indonesian law, the use of polygraph has been regulated in the Regulation of the Chief of the Indonesian National Police, which places polygraph as one type of evidence that can be examined in a forensic laboratory.

This regulation also regulates the formal and technical requirements for the examination of suspects or witnesses, which implicitly demands high data security standards to ensure that information obtained during polygraph examinations is properly protected.

In addition, data security also relates to the qualifications of the experts conducting the polygraph examination. Trained and certified experts, as described in certain cases in Indonesia, are expected to be not only competent in using the equipment but also in maintaining the confidentiality and integrity of the data generated.

Overall, data security in the use of polygraph must ensure that all information obtained during the examination is kept confidential, processed and stored in a secure manner, and only accessed by authorized parties in accordance with applicable law. (Lovina 2020).

Comparison of Polygraph with other methods.

Other methods used to detect lying include more traditional interview and interrogation techniques, body language analysis, as well as advanced technologies such as fMRI (functional Magnetic Resonance Imaging) and EEG (Electroencephalography).(Aristiani and Layang 2022).

Interviewing and interrogation techniques rely on the examiner's expertise to identify inconsistencies in stories or suspicious behavior. Body language analysis looks for non-verbal signs that may indicate lying.

Meanwhile, fMRI and EEG are newer, technology-based methods that attempt to detect lying by observing brain activity. fMRI measures changes in blood flow in the brain associated with neuronal

activity, while EEG measures the brain's electrical activity (Hochman et al. 2019). (Hochman et al. 2019). Both methods have the potential to provide a more objective indication of lying, but still require further research and are not yet widely accepted for use in legal proceedings (Tests et al. 2001).(Tests et al. 2001).

Limitations of Polygraph

Polygraphs, or polygraph tests, have some significant limitations, namely:

First, the accuracy of polygraphs is often questioned. Some studies show that trained people can easily pass the test undetected. In addition, the results of a polygraph examination are highly dependent on the examiner's interpretation, which can be subjective and affected by bias.

Second, polygraphs cannot distinguish between lying and other emotions such as anxiety, fear, or anger, which can affect a person's physiological responses . This means that someone who is telling the truth can be detected as lying only because of the physiological response caused by the emotion, not because of the lie itself.

Third, the use of polygraph examination results in court can raise ethical and legal issues, such as violations of the right to silence and the principle of non-self incrimination, where a defendant has the right not to give testimony that would incriminate himself or herself.

Fourth, not everyone can be tested by polygraph because some individuals may have medical or psychological conditions that affect their physiological responses, making the test results unreliable.

Fifth, the results of polygraph examinations are not always considered as primary evidence at trial and often require additional analysis from forensic psychologists to explain the content of the chart analysis.

Therefore, while polygraph can be a useful tool in some situations, its limitations make it not always reliable as a definitive evidentiary tool in legal proceedings.

CONCLUSIONS, SUGGESTIONS, AND LIMITATIONS

The use of polygraphs as a tool in digital forensic auditing raises new potential for improving the validity and reliability of digital evidence. Despite the positive potential, there are also challenges and considerations that need to be taken into account, such as ethical aspects, data security, and the limitations of polygraph technology.

In evaluating these potential benefits and risks, this research proposes a method that involves polygraph technology validity tests, digital audit simulation case studies, and active participation from practitioners and experts in digital forensics and auditing. This conclusion underscores the importance of detailing measures to minimize risks, understanding ethical impacts, and considering data security implications.

As such, this research contributes to the understanding of the potential integration of polygraphs in digital forensics, while providing a comprehensive view of the associated challenges and considerations. These conclusions reinforce the urgency of continuing to develop more sophisticated audit methodologies while ensuring the security and integrity of digital data in an ever-evolving environment.

This study uses a literature approach so that the study results are only based on previous studies. Based on this, for further research it is necessary to conduct empirical studies to ensure more precise results.

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