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CYBER SECURITY, FORENSIC ACCOUNTING AND INVESTIGATIVE TOOLS

Ishaan Deepak Joshi¹

ABSTRACT

The proliferation of online platforms and the web has heightened the risk of financial and fraudulent issues, resulting in instances of deceptive financial reporting and breaches of accounting norms. As a result, it has become necessary to examine instances of fraud and the individuals responsible for them. The increasing complexity of cyber-attacks against businesses and organizations has made it imperative to enhance data security measures and fortify defenses against these threats. Establishing connections across cyber forensics and accounting examinations is essential for ensuring organizational security. Forensic accountants assist customers in uncovering accounting information and assessing the financial losses resulting from fraudulent activities. Cybersecurity professionals, namely those specializing in forensic analysis and database security, trace the activities of hackers and examine their digital footprints in order to identify instances of data leakage and breaches. Visual aids including as matrices, link diagrams, social network diagrams, temporal analysis, transactions, common diagrams, PERT, and VIA charts facilitate the visualization and comprehension of intricate problems. These tools illustrate the interactions between three objects, analyze the intricacies of social relationships, and assist in organizing events or information chronologically.

KEYWORDS

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Forensic Accounting, Fraud Examination, Temporal Assessment, Social Media Networks, Digital Platforms, Cyber Security

I. INTRODUCTION

The current surge in exposure resulting from the widespread availability of financial and fraud-related information on online platforms and the net has created a need to address and control this tendency. The issue has resulted in deceptive financial reporting, which involves the breach of accounting norms. It is imperative to promptly examine instances of fraud and identify the individuals responsible in order to resolve the problem. Social media sites, such as Facebook, Twitter, and Instagram, have had a substantial impact on changing the way business is conducted, particularly in the investing industry.² The internet plays a crucial role in fostering entrepreneurship and driving economic expansion. Nevertheless, the internet & social platforms can pose significant risks to businesses when misused, leading to potential harm and security breaches. This heightened visibility facilitates the dissemination of financial and accounting data. Criminals utilise social media networks to identify potential targets and acquire their personal information online, which they subsequently exploit to orchestrate phishing assaults.

In recent times, there has been an increase in the complexity of cyber-attacks against corporations and organisations. As a result of these weaknesses, organisations are now actively pursuing data security measures and implementing robust defences against these attacks. The integration of cyber forensics & accounting investigations is crucial for ensuring organisational safety. Forensic accountants have an extensive track record of aiding clients in uncovering inconvenient accounting

² Alshurafat, H., Beattie, C., Jones, G., & Sands, J. (2020). Perceptions of the usefulness of various teaching methods in forensic accounting education. *Accounting Education*, 29(2), 177-204.

truths. They have provided assistance to corporations and the judicial system for many years in assessing and examining damages resulting from fraud and other negative events.

Cybercrime specialists, namely those skilled in forensic analysis and database security, are responsible for tracing the activities of hackers and examining their digital footprint in order to identify instances of data leaks and breaches resulting from an attack. Forensic accountants and cyber security experts are collaborating to tackle the series of data intrusions and exposures, along with the potential costs and damages arising from the breach. Hence, there are numerous benefits to establishing coherence across cyber forensics & accounting inquiries.

II. BENEFICIAL FACTORS

Assessing the whole cost of a cybersecurity breach is of utmost importance as our society increasingly relies on digital technology and more data becomes readily available. The severity of a firm's leaks and losses can vary based on the level of fraud. Engaging the services of an independent specialist, such as a forensic accountant, can aid companies in ascertaining the extent of their losses and accurately measuring the financial damages associated with a cyberattack. Engaging in proactive measures to anticipate and mitigate mistakes before to the occurrence of a crisis might yield significant advantages in the future.³

The objective of aligning cyber forensics with accounting analysis is to exclusively detect malware within the software of the device, disregarding the physical component.

By examining the device's points of access and departure, one may promptly ascertain valuable information about the individuals who

³ Boiko, A., Shendryk, V., & Boiko, O. (2019). Information systems for supply chain management: Uncertainties, risks, and cyber security. *Procedia Computer Science*, 149, 65-70.

accessed the system and the circumstances under which the data was generated. This provides a detailed account of what transpired and when. In the contemporary era of rapid technological advancements and constant digital transformations, the occurrence of cyberspace investigations is an unavoidable and highly significant event. Law enforcement professionals have long recognised the need of using visual tools to help visualise connections in criminal investigations.

Analysts have long been employing cohesive social analysis, whether the focus of inquiry is on persons, organisations, or events. Some potential techniques that can be used during research include matrix & link diagrams, social network diagrams, temporal analysis, transactions, common diagrams, PERT, and VIA charts. While no tool can fully substitute for a comprehensive study, they can facilitate the process and aid in understanding complex topics.

These tools can help you analyse the path that a particular billing transaction took within the victim's financial institution. Whether you are trying to illustrate the structure of a connected intelligence group in an anticompetitive criminal matter or simply trying to understand the destination of a specific payment, these tools can provide valuable insights. Although these technologies may differ, they all share a fundamental characteristic, that is visualisation. The subsequent passage delineates the manner in which these tools are employed throughout the investigative procedure.

III. MATRIX REPRESENTATIONS AND GRAPHICAL LINK DIAGRAMS

Matrices and link diagrams are useful tools for visualising relationships. Both illustrate a three-way interaction between things in two dimensions. Creating a connection diagram without using a linkage matrix is possible, but it becomes increasingly difficult as the chart becomes more intricate.

The connectivity matrix is crucial at this juncture. An association matrix is a systematic way of illustrating connections between items in a logical manner.⁴

It has the ability to represent connections amongst people, organisations, or individuals and organisations, among other things. These tools are constructed using complex computational frameworks and, when used by skilled individuals, can be tweaked and transformed into very advanced forecasting instruments. While their appearances may vary, they consistently consist of a basic arrangement of vertical and horizontal lines. Matrices, sometimes referred to as tables, consist of an organised collection of a relational information databases.

Developers can utilise the aforementioned square matrix to pinpoint a particular entity being observed. We can analyse the correlation between personnel within an organisation, for example. The identities of all the people we wish to showcase a relationship with are listed in the left column. Subsequently, proceed to enumerate all items in the identical order at any location in the frontal plane of the matrix. To indicate an association, we place an X at the intersection of the row variable for A and the horizontal vector for B.

IV. DIAGRAMMATIC REPRESENTATIONS OF ONLINE NETWORKS

The utilization of social networking models introduces an additional level of complexity. While the fundamental theory stays unchanged, network theory starts to examine the patterns of social relationships, introducing a level of complexity to the equation. Nevertheless, as the intricacy increases, the usefulness of enhanced modelling tools also increases.

Simple link diagrams do not provide straightforward methods to demonstrate the strength or directionality of relationships. These aspects

⁴ Nigrini, M. J. (2020). *Forensic Analytics: Methods and techniques for forensic accounting investigations*. John Wiley & Sons.

are essential for comprehending the organization's structure in real-world scenarios. Social network diagrams provide a more effective means of visualising and analysing human relationships. Injustices are present in nearly every relationship; nodes & edges are the fundamental elements of structured analysis and serve as the primary focus of study.

The research topic consists of nodes, also known as vertices, where each node represents a certain individual. A node serves as a placeholder for an entity within a graph, such as a person, institution, or transaction. Edges symbolise entities, and we should connect them when appropriate because our research seeks to illustrate the interactions between things visually, through their vertices. This is achieved by the utilisation of edges. As mentioned earlier, there are multiple exchanges that we can simulate. In graph theory, an unconsummated connection is symbolised by a directed edge, that is a linear segment with a certain direction.⁵

V. ANALYSIS OF TIME-SENSITIVE DATA

Temporal analysis tools facilitate the systematic arrangement of events or data as they unfold chronologically. Temporal analysis tools differ from transnational analysis tools in that they enable us to represent the connections between time and another entity, rather than modelling links between individuals, companies, or groups.

For instance, a basic chronology is a temporal analytical instrument that enables us to visually organise actions in a linear manner. There are multiple applications within this category. Certain tools, such as the time-event chart, exhibit periodic performance measures, whilst others, like the transactional flowcharts, do not.

⁵ Okoe, M., Jianu, R., & Kobourov, S. (2018). Node-link or adjacency matrices: Old question, new insights. *IEEE Transactions on Visualization and Computer Graphics*, 25(10), 2940-2952. doi: 10.1109/TVCG.2018.2865940

All the tools in this category has the ability to aid researchers in structuring and arranging information within a conceptual framework. Frequently, chronological time is the prevailing point of reference.⁶ The tools selected for inclusion in this category are Techniques for Evaluating Criteria, basic timeline, programme evaluation review technique, VIA graphs, & acquisition data flow diagram.

VI. CONCLUDING REMARKS

Today the investor confidence and stability have declined in the current era of economic turmoil. At the same time, there is increasing pressure to attain financial outcomes that meet or surpass expectations. These problems have led to extensive scrutiny and disagreement over accounting documents by shareholders, regulators, and other stakeholders, and a focus on forensic accountants & their responsibilities. Financial investigations are often initiated due to unforeseen financial consequences, financial deception, lost assets, and allegations of fraud.

These investigations require delving beyond the revenue accounts to uncover the truth. This pertains to the necessity of establishing connections across cyber security and monetary accounting in order to effectively conduct investigations and identify individuals involved in fraudulent activities.

⁶ Quick, M., Law, J., & Li, G. (2019). Time-varying relationships between land use and crime: A spatio-temporal analysis of small-area seasonal property crime trends. *Environment and Planning B: Urban Analytics and City Science*, 46(6) 1018-1035.