Integration of Real-time Analysis of Big Data into Sustainability Attributes

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Abstract. The use real-time analysis of big data necessitates auditors modify their evidence-gathering procedures of employing continuous auditing in assuring sustainability attributes. We suggest a model that integrates assurance and its continuous auditing into all five economic, governance, social, ethical and environmental (EGSEE) dimensions of sustainability performance reporting. Real-time analysis of big data facilitates more transparent and timely available information for auditors to perform procedures provide reasonable assurance on accuracy, consistency and completeness of information. Big Data is often referred to as electronic data and is the capability of accessing, analysing, and assessing a huge amount of data and transforming them into information in a timely manner for decision making. The application of Big Data and Data Science Analytics to auditing is currently at an early stage. This study examines the real-time analysis of big data, which including evidence-gathering procedures and tests on audit and assurance services for sustainability attributes. We provide policy, practical and educational implications of employing real-time analysis of big data for sustainability performance as the implementation of continues auditing.

Keywords: XBRL, sustainability, Big Data, auditing

1 Introduction

In today's fast paced business world, the big data enables investors to have real-time online access to a large volume of structured financial information and unstructured non-financial sustainability information about public companies' governance, operations, and investment choices and capital markets. Big Data is often referred to as electronic data and is the capability of accessing, analyzing, and assessing a huge

amount of data and transforming them into information in a timely manner for decision making. The application of Big Data and Data Science Analytics to auditing is currently at an early stage. Real-time big data analysis with the use of continues auditing is expected as the future of sustainability information, which enables various parties to improve the creation, exchange, and comparison of business reporting information (Richards & Tibbits, 2002). Big data is being used continuously as accounting information system to the high demand of financial and non-financial information. The number of studies done on continuous audit has been increasing in the two previous decades. Multiple cases of continuous auditing such as embedded audit modules which are conceptual and theoretical have been introduced. The real-time analysis of Big Data through continuous auditing (CA) is being increasingly used in auditing (Vasarhelyi, Alles, and Williams 2010). But, only Big data analyses have eliminated the problem of operational interference of applications which was posed by operating systems and object-oriented models.

The ever-increasing business complexity, corporate governance, risk management, along with the growing demand for internal and external assurance services for sustainability performance information necessitates the use of technology to modernize sustainability reporting and assurance processes. External auditors are using big data and analytics, and greater access to detailed industry, business, and media information to help them better understand their clients' business industries and standing in social media, identify audit risks and issues, design effective audit procedures and produce high quality audit reports and thus lend more credibility to published financial statements and sustainability performance reports that enable more business value. Information and insights that once were not publicly available now extend far beyond traditional financial transactions and reports and extend into non-financial sustainability performance information and data from email, social media, video, voice, and texts. Insights gleaned from such data can and should extend beyond traditional risk assessment. Integrating analytics into audit and assurance services is not without its challenges. Access to relevant assurance data can be limited, as can the availability of qualified and experienced resources to process and analyze the data. The use of Big Data and data analytics to integrate statistical analyses, anomaly detection, data visualization, and text mining to detect financial and non-financial irregularities at an early stage can be very helpful to auditors in assuring all five EGSEE dimensions of sustainability performance information. Through the use of sophisticated Big Data and data analytics, millions of transactions can be searched to spot patterns and detect errors, irregularities and misstatements.

The use of big data analysis necessitates auditors modify their evidence-gathering procedures of employing continuous auditing. The proposed continuous auditing based on the real time big data analysis model is introduced. Then, the components of real time big data analysis are explained. The current paper proposes a model for a continuous audit that uses real time big data analysis to support auditing processes. This study examines the impact of big data analysis on audit and assurance services and how the use of big data analysis in sustainability perforce reporting can affect audit evidence-gathering procedures and tests. Auditors can use our suggested Big Data, Data Analytics, and the suggested assurance model based on SASB materiality map to

improve public trust and investor confidence in the auditing profession. Future research can use our model to advance research regarding the financial and audit processes.

The remainder of this paper is organized as follows: Section 2 explores the nature of Big Data and Data Analytics and recent research on the application of Big Data and Data Analytics to the financial statement audit. Section 3 discusses the application of Big Data and Data Analytics in providing assurance on the five EGSEE dimensions of sustainability performance information. Section 4 presents the development of our continuous auditing model applicable to sustainability performance information. In Section 5, we test the accuracy and reliability of our model. The final section provides concluding comments and policy, practical, and research implications of our continuous auditing model in providing assurance on all five EGSEE dimensions of sustainability performance information.

2 Literature Review

2.1 Prior Research on Big Data

Prior research consists of recent studies (e.g., Chen, Chiang, and Storey, 2012; Cao, Chychyla, and Stewart, 2015) that provide an overview of Big Data and its implications in audit analytics. Brown-Liburd, Issa, and Lombardi (2015) discuss the challenges in incorporating Big Data and audit analytics in audit strategies and present the behavioural implications of Big Data for audit judgment that affect audit quality. The use of both Big Data and Data Science methods are changing the way auditors gather and assess audit evidence. It is expected that Big Data will grow exponentially and thus, firms and their auditors should proactively search for patterns including irregularities in Big Data and assess and manage their risk profile in auditing. Although there has been growing awareness about big data issues related to the use of continues auditing, current audit practices and standards fall short of providing the needed guidance for the provision of assurance on sustainability data. Auditors will need to the current scope and practice to perform data analysis to provide assurance will need to expand by auditor society (Cao, Chychyla, and Stewart 2015). Currently, there is no requirement for auditors to perform procedures on big data in order to provide reasonable assurance of accuracy, consistency and completeness of sustainability performance information.
To develop a structure for research in Big Data and Data Analytics and its implication's in continuous auditing in providing assurance on five EGSEE dimensions of sustainability performance, we develop a model using Big Data and Data Analytics. We capture conventional financial quantitative and structured data as well as qualitative, non-financial, and unstructured text data as presented in Figure 1.

2.2 Prior Research on Continuous Auditing

Prior research in continuous assurance mainly examines how online instantaneous enterprise systems are altering the old-style year-end audit (Kogan et al. 2003; Alles et al. 2002) and searches for numerous ways to construct continuous auditing procedures (Vasarhelyi, 2002; Rezaee et al. 2002). McGuire et al. (2006) and Rezaee et al. (2002) argue that the audit process has evolved from the manual audit to a computer-based audit. Consequently, through the advent of big data analysis is poised to evolve into the

continuous audit. Additionally, Alles et al. (2002) argued that some even espouse a more extreme view that continuous auditing could lead to continuous reporting which could supplement and then replace traditionally annual audit reports.Combined with the gain in efficiency in the audit processes, big data analysis stands to enhance the efficiency of the whole sustainability reporting process, which will lead to reductions in the cost of creation (Rezaee and Turner 2002) decreased audit costs (Bonson et al. 2009; Rezaee et al. 2002).

Sustainability engagement is a relatively new focus for companies. Therefore it is different kinds of risks associated with sustainability engagement. The manager needs to, with help from the auditor, take care of the opportunities that come with sustainability engagement and reduce the risks. For be able to succeed with that, the manager and the auditor have to keep a good internal control. The auditor's role is to evaluate the internal control. It is the manager who is responsible for the internal control but the auditor need to make an understanding, have to make risk assessments, and test the internal control. They have to have control over those six risks that are associated with sustainability engagement that I mentioned before. They have to seek for material weaknesses in the sustainability events and the internal control of the company
Internal and external auditors are using big data and analytics in the audit process to identify and mitigating risk and improve a company's audit capabilities and enhanced shareholder value (EY, 2015).

Rezaee et al. (2001, 151) defined the continuous auditing as a systematic procedure of collecting electronic audit proof to rationally present idea on the reasonable offering of a paperless financial statement produced in the real-time accounting system. This general definition regarding continuous auditing can be considered widely sufficient to encapsulate all three professional services that are provided by independent auditors (i.e., audit services, assurance, and attestation). The level of assurance together with the model of continuous information specifies the form of services that must be presented through independent auditors. For instance, when the provided assurance provided is regarded as (positive) and as the same time, the continuous information belongs to financial statements, the continuous auditing commitment is recognized as an audit service. Adversely, when the assurance provided is (negative) and the continuous information is principally financial information, the continuous auditing commitment is regarded to be an attestation service. However, once the provided assurance involves continuous information of any information (i.e. financial or non-financial), the continuous auditing commitment is viewed as an assurance service. Nonetheless, continuous auditing accredits the independent auditors to provide reliability to the continuous information supplied through the third parties or management. Continuous auditing provides services to various customers and supplies various levels of assurance and further matches the specific needs with the services.

Vasarhelyi (2005) and Kuhn and Sutton (2006) examined the Enron and WorldCom frauds, respectively, and demonstrate hypothetically how continuous assurance would have helped detect the fraudulent behavior. Continuous assurance will only become an important service if the costs for providing the assurance are lower than the benefits.

Moreover, someone has to be willing to pay for the costs of the assurance engagement (Cohen et al., 2003).

2.3 Prior Research on Business Sustainability

Brockett and Rezaee (2012) discussed five aspects of the sustainability performance known as EGSEE (Economic, Governance, Social, Ethical and Environmental). EGSEE elements are adapted in our study4. Implementation of continues auditing in sustainability practice, assures the trustworthiness and perfection of EGSEE reporting. Understanding the process in which continues auditing assures the practice of EGSEE coupled with the efforts that provide assurance on the EGSEE information in sustainability report, might enlighten the degree to which talented technology assurance act is able to assess the users' report in regards to the reliability and credibility of the current and future sustainability reporting content. Previous studies on the concept of sustainability assurance evaluated the content of the assurance statement (i.e. O'Dwyer and Owen, 2007; Simnett et al. 2009; Kolk and Perego 2010, Brockett and Rezaee 2012; Rezaee et al., 2013). Adversely, only limited number of researches impose the continues auditing into sustainability concept. The assurance statement process considered as a legitimization of the assurance practice with the key audiences (O'Dwyer, Owen, and Unerman 2011).

The current paper aims to extend and develop the trend for the investigation of available studies on the implementation of the continues auditing into EGSEE elements through contribution to the literature (Free et al. 2009; Gendron and Spira 2009; Cohen, Krishnamoorthy, and Wright 2010; Gendron and Spira 2010; Trompeter and Wright 2010). The sustainability assurance concept defined in EGSEE context provides a fundamental opportunity to assess the big data through the continuous auditing.

2.4 Identify the risks in Sustainability

According to Rezaee (2016) are there six risks associated with Sustainability engagement. Strategic risks; there are several strategic risks related to sustainability engagement such as uncertainly in market position, volatility in stock price, stakeholder communications, and investor relations. Strategic risks should be identified, assessed, and managed by internal control evaluation. Operations risks; are linked with all five of the ESGEE dimensions (Economic, Social, Governance, and environmental, ethical). These also have to be evaluated by the manager with help from the auditor's opinion. Compliance risks; There are many rules, regulations, standards, and laws who have to be followed by companies. Many companies create an executive position to prevent compliance risks. In the company don't follow the different types of rules, the can be penalized as in they will be interrupted in business. Financial risks; the financial risk of

[4] Authoritative reports (e.g., GRI, 2015; 2016), prior research (De and Clayman, 2010; Ng and Rezaee, 2013) refer to business sustainability performance as a process of focusing on achieving economic/operational sustainability performance (ESP) as well as environmental, social and governance (ESG) sustainability performance..

issuing materially misstated financial reports is very bad for the sustainability of the company. To prevent misstatement in financial reports, SOX (2002) now require that independent auditors control the financial statement. Security risks; cyber-attacks are big issues for many companies. It takes a safe IT-system to succeed a god internal control. If the IT-system is easy to enter for hackers who intend to steal secret information, it is hard to keep a solid internal control. A quite common reason for hackers to enter companies IT-system is to change their website with intending so destroy the company's reputation. COSO (2015) recommends that companies maximize their protection against security breaches and cyber-risks exposures. Reputation risks; sustainability assurance is strongly linked to reputation. It is important that companies maintain a good business reputation for creating value to the stakeholders. The company's reputation needs to be often evaluated so strategic plans for sustainability engagement can be pronounced. If the company´s reputation is being harmed for some reason, stakeholders and investors might dissociate with the company, and they will lose financial income by reaction for the bad reputation.

The COSO guideline - Enterprise risk management (ERM) is a process to identify risks in different activities and events in the company that creates operational surprises and losses. ERM is a framework for risk management that involves identifying specific events or circumstances in the company´s objectives and then assessing the risks and opportunities. It is important to perform an adequate ERM to improve the effectiveness in all ESGEE dimensions of sustainability engagement (Rezaee, 2016).

3 Proposal Model

Internationally, the importance of the big data via the aggregate via data mining is rising (and contribute the relevance of accounting information to detect fraud and help auditor enhancing transparency and stakeholder decision making (Warren et al., 2015). In today's less trustworthy society, the paradigm has moved from trusting to a condition where most things are audited (Power 1997; Pentland 2000).Big data analysis aims at improving the credibility and quality of the information set for users' decision-making.

In the academic literature and the market, Big Data is recognized by the 3Vs model (volume, velocity and variety), first coined by Laney (2001), which refers to the challenge to deal with:

1) A massive amount of flowing data, (volume);
2) The diversity of topics and data formats (variety);
3) Streaming data almost in real time, i.e. stock market prices, sensors, tweets, etc. (velocity).

The existence of Big data come from the opportunities given by the World Wide Web or the Web, considers a big container of information that allows linking from one document to another to figure out more about the subject (Brin, 1998). There is a big amount of accessible data that can be found on the Web about different topics and in different formats. However, it is quite challenging to analyse and communicate properly

results and findings, given that the majority of the information and data presented is not properly structured and do not offer any information about its content and context.

Within that scenario of information is normal that many industries are trying to exploit data for competitive advantage (Chaudhuri, 1998). The problem is that the volume, variety and velocity have far outstripped the potential of conventional databases and analytical solutions. Traditional data warehousing tools do not support the unstructured data sources and the expectation on processing speeds for analytics. New technologies are required to tackle that new complexity of data space and make possible new opportunities offered by data science. For that extend, big data tools appears, embracing a set of potential technologies to carry out data-driven applications with large volume of data, handling and analyzing structured and unstructured data from a variety of topic, from different devices (sensors, smartphones, tablets, ..) and term frequencies (real time, quarterly, annually..).

Big data brings the tools for processing and collecting complex data and facilitate data science techniques to explore and analyses domain problems with good performance. Besides, it involves a big spectrum of proper visualization, analytical tools and modelling techniques, from conventional statistics to machine learning and data mining algorithms, to the end be able to analyses and communicate results and findings properly.

How to become data into valuable information for decision-makings is the question that Big Data always try to solve. In this study, we consider Big Data the mechanism to achieve better corporate information whose goal is based on the following fundaments (Brobst and Rarey, 2003):

- Access to the information increases the quality of decision-making.
- Developing a superior corporate strategy is a fundamental part to succeed in a competitive business environment.
- The emergency of the vast amount of information, big data technologies and data science techniques influence the execution of a business strategy.

Business organizations are all affected by the emergence of Big Data, which makes it impractical, if not impossible, to search through a vast amount of data manually to gather audit evidence. Thus, Big Data requires the use of sophisticated analytical tools and platforms of continuous auditing to effectively and accurately identify potential risks with both financial and non-financial sustainability performance data as presented in Figure 1. It is expected that Big Data will grow bigger, and thus corporations and their auditors should proactively search for irregularities in Big Data and assess and manage their risk profile in assuring EGSEE dimensions of sustainability performance information. We will examine the use of the Big Data in continuous assurance on five economic, governance, social, ethical and environmental (EGSEE) sustainability performance dimensions.

Our proposed model is designed and expected to address the following questions:

1) What attributes and characteristics of Big Data can be used to identify financial and non-financial EGSEE dimensions of sustainability performance information?
2) What continuous auditing model should be developed to capture all relevant EGSEE sustainability performance data and process them?
3) How can the model be adapted to changes in the business environment and the audit process?
4) How can data science principles and analytical models be used in continuous auditing to provide assurance on all five EGSEE dimensions of sustainability performance information?
5) What resources and technologies do auditors need to have to capitalize on big data and data analytics in sustainability assurance services?
6) Do auditors have appropriate audit strategies, plans, and programs to use our proposed sustainability assurance model?
7) Can the proposed model increase audit efficacy and help auditors provide sustainability assurance?
8) How should external auditors coordinate with management and internal auditors to use our proposed data analytics tools and sustainability assurance?
9) What are the impacts of our sustainability assurance model on auditing today, and auditing in the future?
10) What are the extent and the scope of sustainability data currently being captured by auditors?
11) How can the client company's internal IT function work with external auditors to utilize Big Data and to streamline the data capture process?
12) Can external auditors access the client's internal corporate data without jeopardizing or compromising the integrity and security of the sustainability data?

The continues auditing appears in the sustainability concept, largely becomes codified and standardized through the establishment of bridges among various methodologies to provide a general image of the proficiency of the results through rationalization of the evidence-gathering process (Humphrey and Moizer 1990). The study pursues big data to creatively generate a new model for big data analysis practice along with presenting the auditable sustainable reporting. In order to present a verifiable sustainable report, the authors introduced an external big data analysis solution " shall supply a detached assurance on the completeness and relevance of sustainability report material with the emphasis on the evaluation of the trustworthiness of the big data analysis.

Numerous fast-growing organizations conduct various types of business that publish real-time online sustainability reports. The paradigm of "Real-time sustainability reporting" requires continuous auditing to present continuous assurance in regards to the reliability and excellence of the delivered sustainability. The auditing process inevitably has evolved from a traditional manual auditing to computer-based auditing. Today the auditing process deals with creation of continuous electronic audits. The emerge of the concept of information technology along with the requirement for rapid communication between involved stakeholders, make it necessary for auditors to establish new methods to consistently monitor, collect and analyze the audit evidence.

Continuous auditing is recognized as unabridged electronic audit process which accredit the auditors to purvey acceptable level of assurance on continuous information concurrently or shortly after, the divulgence of the information. This paper is founded on the ground of the available related literature, creative continuous auditing applications, and the authors view upon experience. It is tried to present an approach for the formation of continuous audit capacity. In this context, audit data of warehouses and data of marts are described. The growth of technology infer that the exchange of sustainability data in real-time creates a constant stress for the auditors to update the current auditing methods. Most of the recently introduced methods require the implementation of new software and auditing models. The need for future research with the emphasis on the improvement of continuous auditing in terms of different auditing aspect (i.e. assurance, attestation, and audit services) is inevitable.

The audit process has evolved from the manual audit to computer auditing and is moving towards electronic continuous auditing. This evolution suggests fundamental changes are likely to occur in the audit process. As audit clients shift towards real-time accounting systems and XBRL-based financial reporting, auditors will no longer be able to audit around the computer. Instead auditors will employ powerful software packages to constantly capture evidence at the same instant a transaction occurs. Audit data will be stored in audit data marts that will support sophisticated, often automated, analytical procedures. Exception reports will be produced automatically or on demand (Rezaee et al., 2002).

Independent auditors may use this model to collect audit documents in order to verify financial information mentioned in financial statements. This process continues constantly. In the mentioned model, independent auditors are able to record audit services mentioned in continuous auditing big data similar to universal description, discovery and integration mentioned in under-study machine audit system. Users and consumers of audit system who are searching for the real time big data service are able to refer to continuous auditing. Therefore, auditors are able to control processing procedure, for, users and consumers are forced to use the big data services propagated by auditors, while users and consumers of accounting systems deal with providing big data services. These services may be embedded in continuous auditing based on big data services in order to motivate auditors. The way and order of administrating this process are shown in figure1. Therefore, services mentioned in continuous auditing web services inventory are real-time and audit tasks are done in time. Figure 1 shows the mutual relation between the auditor and the continuous auditing based on big data. Auditors and machines should define their big data analysis to create a real time big data based Data communication centre for auditors to facilitates the audit processes and reform their services continuously.

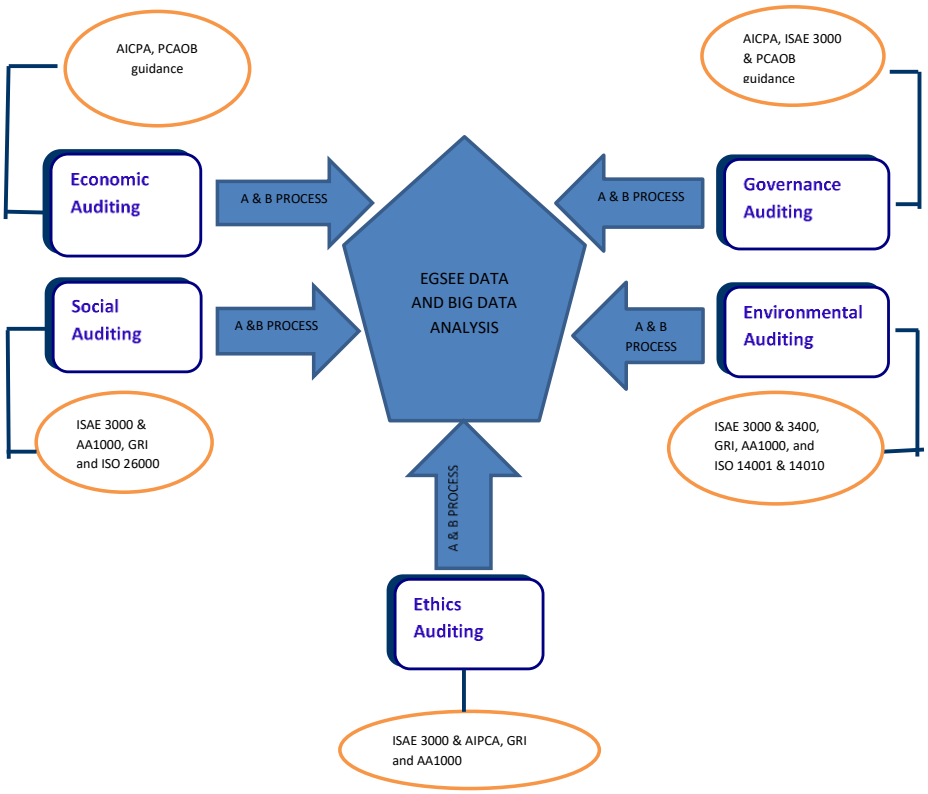

Fig. 1. Integrating Big Data into sustainability for continuous auditing

some cases, auditors need to have a third party to verify certain information in order to assure the reliability of information. The reason is that the business documents have to be valid and documented always. In business transactions, it is obligatory to verify information by a third party. In our model showing the relation between an auditor and third party. According to the fact that continuous auditing based on big data in embedded and there is no need for real-time verification of information; therefore, a big data server computer is needed for the third party systems. In the case of needing information verification by the third party, the system responsible for auditing send a request to the third party to receive the required documents. World server computer in the third party receives the sent request and prepares itself to send the requested documents. Auditing system receives the documents sent by the third party and compares them with its documents. The system embedded in auditing terminal should be able to use the results automatically and changes the outputs into big data-based structure. The third party is quite different from investors, bankers and analysts.

In addition to all general advantages which are ubiquitous in other continuous auditing models also, the proposed model resolves the problems of other models and assures that auditing is done continuously.

Big data analysis services technology is a certain standard accepted globally. Big data services can do a callable operation. The mentioned operation may include everything from a simple request to complicated business processes. After a big data analysis service is ordered and continuous auditing is registered, other applicable software enters the phase of requesting this big data analysis service. It means that a big data analysis service should be registered in continuous auditing enables auditing software to access the applicable documents and software in order to initiate applicable software according to a general way. It means that big data analysis service model is independent of the software used by auditor to supply auditing information. Therefore, administrating auditing plans and designs in such a model is a kind of problem. In comparison with other auditing plans and designs based on embedded auditing modules, the method of using big data analysis services proposed in this paper does not need to recruit full-tie auditors for the design phase.

4. Continuous Auditing Process and Big Data

Continuous auditing has an influence on the conventional auditing procedure in various routs. Firstly, it is rational to anticipate that the level of auditors knowledge in terms of the big data shall be empowered as ascertain the relevance and credibility of big data. The knowledge of the big data approaches and is vitally viable for the evaluation of involved risk and internal control coupled with proper objectives of the big data in a particular business procedure.. The developments in continues auditing as well as the implementation of big data platforms for sustainability performance, gives confidence to auditors for placement of even higher focus on the procedure of a particular business from the early stages of planning. This facilitates the alignment of the audit system with the creation of appropriate real-time analysis of big data which complies with the specific industrial requirement. Secondly, the auditors require to whole-heartedly recognizing the flow of transactions and other types of control activities, which certify the credibility, and trustworthiness of relevant information in the real-time analysis of big data. Through real-time analysis of big data are transferred, processed, and accessed in continues auditing routs mainly rely on the functionality of internal control procedure on its credibility and perfection. Thirdly, in continuous auditing, the auditors require hiring the plans equipped with a control-risk-oriented paradigm which fundamentally emphasis on the sufficiency and functionality of internal control activities of the real-time analysis of big data rather than placing salience on the salience on substantive testing of big data transactions. Continuous auditing needs the development of big data internal control templates to (a) assess the sufficiency and functionality of the big data internal control platform; (b) evaluate intrinsic-value of risk control, and (c) provide accurate and detailed auditing test to be conducted. The internal control templates are capable of conducting big data assessment of complicated control (i.e. authentication, passwords, firewalls and coding of the classified information). Lastly, continuous auditing needs the development of particular big data softwares as audit tools which should be able to audit on a big data or to purchase relevant commercial software packages. The continuous audit tools and techniques (CATTs) facilitate the evaluation of risks and assess the internal controls. In addition, they can conduct different audit

processes electronically (i.e. download information for analytical review, data extraction, counting records, footing ledgers sample selection for control tests and substantive tests, identification of the abnormal transactions, and performance confirmations).
Auditors can perform control tests concurrent with tests of transactions details and functional and analytical procedures to collect convincing evidence concerning the integrity and quality of the customer's electronic system in order to develop credible and reliable and financial information. Through substantive tests of transactions details, the auditors can determine whether irregular or erroneous transactions processing has resulted in misstatements of material in the financial statements. It is possible to conduct transactions tests through CATTs unceasingly all year round to decrease a number of tests of account balances frequently done after the date of balance sheet. Continuous auditing collects evidence concerning the subsequent queries: (1) what are the authentication techniques; (2) how is the electronic gathering of data; (3) how, from whom, and from where are the data initiated; (4) how are the data processed, and (5) what are the networks employed to initiate and communicate the data. Auditors normally employ particular programs i.e. auditor-defined heuristics (control agents) used for a set of transactions. After finding unusual activities, the control agent looks for comparable activities to clarify the pattern of activity and if extraordinary rare activities are detected, signals the auditor (Kogan et al. 2000). To identify unusual patterns, the control agent applies advanced analytical methods such as digital analysis as well as data mining.

Audit programs are either developed online or obtained from web-based tools of auditing commercially available (Intacct Corp. 2001). Real time big data analysis would make the internal and external auditing of corporate information easier and more dependable. Hunton et al., (2003) argued that continuous reporting may also create new demands for assurance services apart from the traditional statutory audit of financial statements.

To evaluate the effectiveness of the internal control, the auditors must tell their opinions about the internal control. Internal control consists of five components; management´s control environment, management´s risk assessments, management´s information and communication system, management´s control activities, and management´s monitoring of the control system (Louwers, Ramsay, Sinason, Strawser & Thibodeau, 2013). The auditor must understand this five component´s in the company and document his thoughts in the audit files. To explain the auditor´s role easily; he or she must understand the client´s business to make a correct opinion about the company´s internal control. The big data analysis is a tool that helps the auditors detect and prevent misstatements that occur in transactions

5. Conclusion and implications for Future research

The current paper proposes a continuous auditing model using real time big data analysis services in order to administrate auditing approaches. In this paper, it is

investigated that how big data are used to facilitate continuous auditing for future systems. Finally, a continuous auditing model using big data services technology is proposed which is embedded in the sustainability information platform.

A growing number of business organizations (more than 15,000) are reporting various EGSEE dimensions of sustainability performance and Big Data and data analytics are increasingly being used by auditors in providing assurance services. Thus, we present a model that integrates assurance and its continuous auditing into all five EGSEE dimensions of sustainability performance reporting. Big Data requires the use of sophisticated analytical tools and platforms such continuous auditing to effectively and accurately identify potential audit risks and simultaneously gather audit evidence on both financial and non-financial information provided by the use of Big Data and perform data analytics in offering continuous assurance on all five dimensions of sustainability performance. It is expected that Big Data will grow bigger, and thus corporations and their auditors should proactively search for irregularities in Big Data and assess and manage their risk profile in performing continuous auditing of offering assurance on all EGSEE dimensions of sustainability performance. Our model provides policy and practical implications. Future research can use our models to advance research regarding the financial and audit processes

The growing market for big data information needing assurance is either presented as a fragment of more extensive continues audit. The present and ongoing demand for a variety of assurers for subject matter big data information were discussed in this paper. A distinguished trend is the integrated reporting that is aimed at combining reporting of non-financial and financial information into one report.

The progress of continues auditing service brings opportunities for academics both in research and teaching. From an academic standpoint, continues auditing can be considered as a case in which the assurance process has applications for big data subject matters. Research paths consist of worldwide assuring of big data information and additional investigation of present big data information practices. The factors motivating selection of assurers by entities and assurance standard especially authorize more exploration. Further rich research areas include investigation of the required procedures for a partial continues auditing in comparison to a judicious assurance engagement, and the method of big data this in the assurance report to share the obtained assurance level suitably. Moreover, it would be beneficial to research the uncertainty aspects intrinsic in determining and reporting big data, and the way the auditors face these doubts, as well as dealing with the decision efficacy of big data information for different stakeholders. The significant role of the auditing profession in this developing field (multi-disciplinary teams of big data assurance) has been reinforced by this discussion from a practitioner's standpoint. Moreover, the discussion accentuates the current dichotomy of Big data. It is beneficial for practitioners to consider the factors that have produced and maintained this dichotomy as their engagements in this new market are increased.

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