Big Data and Its Accounting Effects between Challenges and Opportunities: A LITERATURE REVIEW

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المستخلص

تهدف الدراسة إلى البحث في فرص استخدام البيانات الضخمة في المجالات المتعددة في المحاسبة، وذلك عن طريق تقديم مجموعة من الدراسات الأكاديمية التي تناولت البيانات الضخمة وأثرها على مهنة المحاسبة مع بيان الفرص والتحديات التي تواجهها. ويعتمد تصميم هذه الورقة على استعراض الادبيات خلال الفترة الممتدة من سنة 2012 الى سنة 2019، وتحليل ما توصلت إليه هذه الادبيات من نتائج لتحديد الآثار المحتملة للبيانات الضخمة على مهنة المحاسبة، توصلت الدراسة إلى أن للبيانات الضخمة أهمية كبيرة في خدمة المحاسبة ومجالاتها من خلال توفير المعلومات لاتخاذ القرار والتعرف على المخاطر في وقت قياسي رغم التحديات التي تواجهها، واوصت الدراسة بضرورة تناول البيانات الضخمة واثرها على محاسبة التكاليف والمحاسبة الضريبية ومحاسبة التنمية المستدامة.

ABSTRACT

This study aims to search the opportunities of using big data (BD) in the various fields of accounting, by presenting a set of academic studies that dealt with (BD) and its effect on the "accounting profession" indicating the "opportunities and challenges" it faces. The design of this paper is based on a review of the literature during the period from 2012 to 2019, and an analysis of the results of this literature review to determine the possible effects of big data on the accounting profession, The study has concluded that the big data is of great importance in the accounting service and its fields by providing information for decision-making and identification of risks in a record time despite the challenges they face, the study recommended the necessity of dealing with (BD) and its effect on cost accounting, tax accounting and sustainable development accounting.

Key Words: Big Data, Accounting, Accounting Practices, A Literature Review.

1.0. INTRODUCTION

The world is now witnessing what is known as the fourth industrial revolution led by (BD) , resulting from technological development, the spread of the Internet and the transition to the world of automation, in order to achieve competitive advantages for companies (Al-Maghazi and Saleh, 2018), The first common appearance of the term (BD) in the annual USENIX technical conference was in 1999, references to the term in academic literature were more common in IT systems and medical sciences in the early 2000s, whereas in the area of accounting and finance writings on (BD) began in the beginning of 2011 (Cockcroft & Russell, 2018).

In view of the development in the business environment, it has become necessary for us to keep pace with the developments and benefit from them in developing the accounting profession and adapt it to these developments.

(Bhimani & Willcocks, 2014) assessed technological and operational changes and their effects on the strategy and structure of the institution and changes in the "cost mix and the implications" of "cost management mechanisms" and the use of external sources and cloud computing and moves toward digitally enabled businesses that include augment roles for the financial function within organizations and specifically to provide information for "managerial accounting".

Much of the agenda for providing (IA) in light of the emergence of (BD) and "challenges and trends" in "information literacy" will undergo, in some organizational contexts, a process of shifting an understanding of the key role of data integrity at all stages of collection and processing, and designing the business based on a more detailed understanding of knowledge, which allows to promote the diffusion of emerging technologies to capture and analyze data, and to adopt more accurate analyses of strategic control links, the complexities of cost management, "outsourcing" and "cloud computing" will prove to be a growing concern for (AI) providers (ibid., 2014).

This is confirmed by recent initiatives by the American Accounting Association (AAA) and the International Business Schools Development Association (AACSB) on the importance of incorporating (BD) into the accounting curriculum (Sledgianowski, et al., 2017).

At the same time that "accountants move towards" (BD) and business analytics, they should be careful, (BD) does not require collective and undue dependence of a set of administrative controls, (BD) encourages overload activity on data and information, a concern that has been recognized by many financial officials in a recent study (EIU, 2013).

2.0. THEORETICAL FRAMEWORK

(BD) does not have a specific definition that gives you a clear answer to what this data is, but it is simply data that cannot be stored or processed using traditional databases due to its large size and multiple sources, and the United Nations describes (BD) as: "data sources of large sizes, high speeds and diversity, which requires new tools and methods to capture, archive, manage, and process it in an effective manner", (BD) is the term used to describe this group of (BD) that is growing very quickly, and therefore will have a significant

impact on enhancing productivity, profits and risk management. However, (BD) is itself a collapse of limited value until they are processed and analyzed (Ramlukan, 2015).

The term "BD" according to the Association of Chartered Certified Accountants (ACCA) refers to a broad set of data that is steadily collected using tools and technology, such as debit cards, the Internet, social media, electronic brands, and most data that is collected disorganized (Dennehy, 2016).

ISO (2017) defined it as a set of data that has unique characteristics such as size, speed, diversity, variance, reliability and data validity, it can't be efficiently processed using conventional technology for achieve benefit from it.

It is also defined by (Gartner) company , which is specialized in IT research as: large, fast flowing, and diversified information assets that require economically feasible and innovative processing methods for the "development of insights", "decision-making methods" and process automation (Hartmann, et al., 2016).

(Youssef, 2018) and (Sharma, 2015) indicated the types and sources of (BD) and divided them into:

1. **Structured data:** It is data organized in the form of "tables or databases" preparing them for processing.
2. **Unstructured data:** This data constitutes the largest percentage which people generated daily from the writings of text and images and video messages and clicks to Internet sites.
3. **Semi-"structured data":** It's considered a type of structured data, but this data isn't designed in "tables or databases". These data are issued by one of the governmental and non-governmental programs, and they may originate from an internal source, such as data produced from different departments, divisions, people, and workers in various activities, such as invoices, purchase orders, incoming or outgoing checks, and sales numbers that are registered in the form of reports, notes, and registered discussions, and may originate from an external source through customers, suppliers, and various organizations, from the market, the mechanism of supply and demand, consumer feedback and purchase, and from bulletins and periodicals.

(Sharma, 2015) showed that (BD) usually has four characteristics:
1. **Size:** the amount of data being created is vast compared to traditional data.
2. **Diversity:** it comes from various sources and is being created by "machines" as well as individuals.
3. **Speed:** where data is generated very quickly, i.e. the process does not stop even while sleeping.
4. **Credibility:** you need to test the validity of the data because (BD) is sourced from many different places.

(O'Leary) added another property which is value: which indicates the contribution of data and analysis to making a sound and timely decision for companies, and also adds that the value depends on size, speed, diversity,

and honesty, or in general, the value depends on size, speed, diversity, and honesty (Al-Maghazi and Saleh, 2018).

The SAS software company added two additional dimensions, namely Change: It indicates how the data is constantly changing, and complexity: It indicates the multiplicity of data sources, where data is collected from a wide range of sources, in which it is difficult to collect, clean, store and process asymmetrical data (ibid., 2018). (Lee, 2017) also suggested an additional dimension of big data, which is decay, and indicates a decrease in the value of data over time.

3.0. METHOD

This paper aims to explore the challenges and opportunities presented by (BD) on accounting and think of it critically to measure its impact on accounting, the primary method was to review the systematic literature that dealt with accounting aspects as was the Effect of (BD) on accounting in general, and the scope of the "literature review" included from 2012 to 2019, sources from the field of (BD), auditing, financial and administrative accounting and cost accounting.

4.0. LITERATURE REVIEW

(Bhimani & Willcocks, 2014) study aimed at promoting the diffusion of technology in data collection and analysis and the adoption of more accurate analyses in cost management, it also examined the impact of (BD) on changing the role of accountants and accounting practices in general, and concluded that (BD) would change the nature of the accounting profession, and stressed the need to change the traditional concepts of economic unit managers and increase their ability to absorb different knowledge and develop strategies that are more consistent about data and information and their suitability with the economic unit strategies.

(Warren, et al., 2015) indicated that (BD) has increasingly important ramifications for accounting, even as new types of data arrive. Through the availability of visual, audio and text information available via (BD) to improve management accounting through its contribution to the development and development of effective administrative control systems and budgeting processes. In the area of "financial accounting", (BD) will improve the quality and relevance of (AI), thereby enhancing transparency and decision-making regarding stakeholders. In the field of financial reporting, big data can help in setting and refining "accounting standards", which helps to ensure the continuation of the accounting profession in providing useful and timely information in light of the development of the global economy.

(Schneider, et al., 2015) examined the impact of (BD) analyses on accounting practices, and discussed their use in the field of financial accounting, managerial accounting, taxation, and fraud detection, indicating that it is the last most beneficial area of (BD) analyses by disclosing unusual transactions that indicate money-laundering activities, the study examined some opportunities and challenges in the field of (BD), and concluded that (BD) analyses offer many advantages in terms of cost-effectiveness and the ability to define new patterns in real time compared to traditional methods, as

it increases from the ability of accountants to make complex and innovative decisions, indicating that there is research which is needed to study corporate responsibility on how to maintain the privacy and confidentiality of its data .

The study of (Gepp, et al., 2018) and (Alles & Gray, 2016) aimed at using (BD) techniques in auditing, and clarifying the importance of (BD) for auditing and its impact on developing auditing standards and evidence for audits for the purpose of providing reliability and appropriateness. The study found that previous studies extend to three variables which are modeling financial distress, modeling financial fraud, predicting the stock price in the stock market and quantitative modeling, and also found that the audit is lagging behind other research streams in the use of valuable (BD) technologies, and that auditors are reluctant to use technologies that are much ahead of their customers.

(Cockcroft & Russell, 2018) searched for opportunities to use (BD) in financial accounting, the widely sought-after (BD) areas are models of trust and reputation in customer service industries, and banking and financial industries have adopted customer analyses, and the result of the analysis showed that previous studies in (BD) are classified into six aspects: risks, data visualization, privacy and security, data management, predictive analyses, and data quality, and the study found that the accounting profession is in a good position to exploit (BD) to manage risk, fraud, auditing and performance measurement .

(Salijeni, 2018) aimed to analyze (BD) and its social significance for conducting external audits, and addressed two value areas: namely, strengthening the (BD) analysis in the audit field and including it in the audit process, where the strengthening of (BD) analysis in the audit field is understood by building exploratory strategies, while the inclusion of (BD) analysis in the audit process is explored using identity structuring structures and affordability, study results indicate that audit firms use, when promoting the analysis of various (BD), exploratory strategies to either motivate more audiences and increase their confidence in commitment of auditors with quality auditing or to add value to their clients. In this regard, audit firms use arguments related to science and historical existentialism based on value and purpose to show that (BD) analysis addresses concerns related to audit quality. However, companies face challenges regarding data security issues, lack of understanding of the meaning of (BD) and the context where (BD) analysis should be used in auditing.

(Al-Maghazi and Saleh, 2018) aimed to demonstrate the impact of (BD) on the quality of financial reports by presenting the impact of (BD) on the objectivity of financial reports, the development of accounting practices, and the extent of their contribution to the transformation of financial reports from periodic reports to real-time reports. The study found out that (BD) application helps to support the competitive advantages of companies, increase the quality of financial reports, and increase the quality of disclosure, in addition to supporting accounting practices.

(Youssef, 2018) addressed the importance of developing the accounting profession in the environment of (BD), and focused on three

elements: the development of accounting standards, the development of syllabi and curricula, and the development of quality characteristics of accounting information. The study concluded that the use of the physical evaluation of the importance of (BD) in general for accounting and considering it as very important from the point of view of both experts in the use of (BD) and the authors of financial reports.

(Younis, 2019) aimed to clarify (BD) in changing the accounting profession and the roles of accountants, while highlighting the need for the accounting environment to analyze that data. The study found out that (BD) analysis provides adequate information that helps in improving the quality of financial information, completeness and accuracy of accounting records, evaluation of assets, accounting estimates, transparency of completeness of financial reports, fair value accounting, and the evolution of accounting standards and their effectiveness.

5.0. RESULTS AND INTERPRETATIONS

Through a review of previous studies, it is evident that the studies conducted in the Arab environment that dealt with (BD) are scarce and important in the fields of multiple accounting, in addition to that, most Arab studies dealt with (BD) and financial accounting theoretically or conducting exploratory studies. The focus of these studies is on the aspects of financial accounting and neglecting other accounting aspects. Additionally, most of the foreign studies focused on the challenges and opportunities facing the accounting profession due to the application of big data and most of them focused on internal and external audit, financial accounting and administrative accounting, and partially focused on tax accounting and cost accounting.

Consequently, the researchers agree with the study of (Younis, 2019) and (Youssef, 2018) that efforts are still weak in dealing with the topic of (BD) and its effects on the potential profession and its importance to the authors of financial reports and users and professional organizations interested in the accounting profession. In addition to the lack of previous studies for the applied side, most studies have paid attention to the theoretical narration of the concept, importance and impact of (BD) of the accounting profession, and the lack of interest in these studies is due to the application aspect of the novelty of the topic on the one hand and the difficulty of application on the other.

As researchers agree with both (Coyne, et al., 2018) and analysis the role of accountants in the era of (BD), accountants should play an value role in the governance of (BD) information because they have a strong ability to define the information and control needs of internal and external decision makers. "On the other hand (Palem, 2014) indicated that many organizations are realizing that they need (BD), but they really don't understand what they need".

(Kaya & Akbulut, 2018) note that academics and accounting professionals are trying to "adapt to the challenges" of (BD) in terms of the use and mastery of new technologies and applications. They realize that they need to ameliorate their capabilities and proficiency in the areas of (BDA).

Consequently, the relationship between (BD) and accounting can be illustrated by the following form:

The Relationship between Accounting and Big Data			
		1- As a means of accounting	2- As an accounting goal
The relationship between accounting and big data	Big data as an accounting target	Focus on new performance indicators in the big data environment	Focus on big data governance
	Big data as a source of information	Research focuses on big data as a source of data that influences decision-making, and considering big data as a good alternative in light of technical development, and the speed of spread and change of data.	

(Younis, 2019)

Through what has been presented in previous studies, the most important opportunities and challenges facing the accounting profession can be illustrated through the following table:

Table (1)
Challenges and opportunities facing the accounting profession when adopting (BD)

Area	Opportunities	Challenges
Evaluating data assets	• Helping companies evaluate their data assets by developing robust evaluation methodologies. • Increasing the value of data through supervision and quality control.	• (BD) can be quickly decayed when new data become available. • The value of the data varies depending on its usage. There is suspicion about future developments in regulation, global governance, privacy rights and what they may mean in terms of the value of the data
Using it in decision making	• Using (BD) to provide more specialized support for real-time decision making. • Working in partnership with other departments to calculate points where (BD) can be beneficially shared with internal and external stakeholders	• Self-service and automation can weaken the need for standard internal reporting. • Cultural barriers may hinder data sharing between silos and across organizational boundaries.
Using it in risk management	• Expanding data resources used in predicting risks seeing the bigger picture. • Real-time risk identification for fraud detection, fraud and criminal accounting. • Use of predictive analyses to test the risks of long-term investment opportunities in new markets and products.	• Ensuring that correlation and causation are not confused when using various data sources and (BD) analyses to identify risks. • Predictive analytical techniques mean budget changes and return on investment accounts. • Finding methods for a failure-based learning factor from rapid experimentation methods to operations, budgets, and capital allocation.

(Yew, 2013)

While (Yew, 2013) believes that financial accountants who combine their basic skills with new skills in (BDA) will help Enterprise: ameliorate

decision-making, risk management, distinguish and grow new markets, improve working proficiency, and increment overall revenues.

6.0. CONCLUSIONS AND FUTURE STUDIES

Due to the huge technological developments that the world is witnessing and its reflection on all scientific and social disciplines, including accounting, the study aimed at identifying the impact of big data on the accounting profession and its multiple disciplines and the opportunities and challenges it faces, by reviewing the literature that covered the subject throughout the research, where it was found that big data is of great importance in the field of accounting and its multiple disciplines, as it contributes to providing information that helps in decision-making, quality control, risk predicting and fraud detection, but it faces many challenges and in particular that accountants have little understanding of converting big data into useful information and that they need effective ways to deal with big data, and therefore we conclude that big data has a key role in providing information if effective means are available to process this data and the inclusion of accountants and auditors in training courses that contribute to the development of their capabilities, and therefore the field for future research is still open for researchers to address big data and know its effects more broadly on cost accounting, tax accounting and accounting for sustainable development.

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