The primordial role of Business Intelligence and Real Time Analysis for Big Data : Finance-based case study

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ABSTRACT This study is about big data and its relationships with business intelligence and real time analysis. Few studies have studied this relation and fewer the parameters and variables of the characteristics and relations. In this study, this is presented in the literature review then for the research method, it is a questionnaire to finance sector leaders managers –unit of analysis- with lickert scale, yes and no questions and comments about the characteristics and relations of big data with real time analysis and business intelligence. The analysis uses SPSS for windows and NVIVO 12 for the quantitative and qualitative analysis. The results of the analysis present concrete and concise models in which big data is in relation to real time analysis and business intelligence. It also provides a thematic analysis leading to the development of a new framework model that lead to the definition of the characteristics and relationships. There are various theoretical and managerial implications for the big data management and possible finance sector. The future research is to scale the questionnaire to a survey basis, to modify the origins of the questions to a complete lickert scale and to elaborate on new links with big data using the new conceptual framework.

KEYWORDS: Big data, Business intelligence, Real time analysis, characteristics, relationships

1. INTRODUCTION

There is no doubt that business intelligence (BI)-based decision-making must be effective if competitiveness is to be maintained for long-term growth. Big data collection and analysis are now vital due to the quick advancement of information and communication technologies, which has led to a significant surge in academic research on big data and big data analysis (BDA) (Dong-Hui & Hyun-Jung, 2018). We agree with this particular point of view, however, many of these research are unrelated to BI since businesses do not fully grasp and use the concepts. How does big data differ from earlier methods of data analysis? Supporting internal corporate strategies is the main objective of conventional small data analytics, which all managers are more or less familiar

with. But big data also provides a promising new perspective: finding fresh ways to provide clients with high-value goods and services (Ge, 2018).

In other words, digital transformation in the corporate world refers to the incorporation of digital technologies across all functional divisions, from product development to customer service. This idea is crucial for a company's and its economy's overall sustainable growth. Based on this reality, the researcher investigated the significance of digital transformation for overall strategic performance inside a firm through the use of big data, the Internet of Things, and blockchain-based capabilities (Bhatti, 2021). As Paradza and Daramola (2021) argues that to maintain their profitability and long-term sustainability, organizations must obtain enough business

value (BV) from the implementation of business intelligence (BI). Many organizations that have implemented BI, however, nevertheless do not comprehend the subtilies that determine the realization of BV from BI. Also, a new way to look at this is that Governments in the United States and other countries are using data analytics more and more to enable data-driven decision making. The research community has, however, paid little attention to how various players (producers and consumers) inside governments, in particular municipal governments, employ the tools, methodologies, and outcomes of data analytics. This study investigates the primary elements that affect the application of data analytics from a socio-technical perspective (Cronemberger (2018).

The current trends of big data is in relation to critical decision making, real time analysis, analytical methods and business intelligence. Previous studies lack research in forming an exact relationships among big data and real time analysis and business intelligence so further studies is needed to clarify the business intelligence and real time analysis characteristics involved in the development of big data. Considering the demand for research about business intelligence big data and real time analysis, what influence the characteristics of these variable are not yet presented in extensive research conducted that describe and develop the construct of big data, business intelligence and real time analysis. There is little empirical research on these variables and little incentive to make the research to incorporate also about the relationships among big data, business intelligence and real time analysis. In the literature, there is not yet a strong sense and meaning about the relationship among these variables. The aspect about the links about these constructs is neglected and not taken into consideration. The intent of this study is to provide exact meanings about the variables and their relationships.

The objectives and purposes of this study is to help identify the characteristics and relationships among big data, business intelligence and real time analysis. As planned, the objectives of this study provide an overview of how it will reached the investigation on the variables of the study. The purpose is to understand exactly the mission of conducting research about big data and business intelligence and become much clearer. The purpose of this study can be divided according to the research questions to various sub purpose as a first purpose

there is the identification of the characteristics of big data and business intelligence and as a second purpose there can be the identification of the relationships among these constructs. The data collected for the study also essentially will provide data about the subject of the study that are evidences to show the existing relationships among big data and business intelligence and to provide necessary data to understand the research purposes.

Indeed, the aims of the research are that there is significance in the investigation on the relationships among big data, business intelligence and real time analysis because the contribution of this research in this field is in the way it is examined and analyzed. The research may be using variables that have never been examined before because the instrument that is developed in the form of the data analysis method and the precise questionnaire measures the variables better than others on the market. Also, this research is the next logical step in a continuous line of inquiry that solve an important subject about big data and business intelligence that is not yet made in this discipline. Thus, this study is important and valuable, it will create new knowledge with these new relationships among big data, business intelligence and real time analsyis.

The use of a case study in cross sector will be used. A case study is the collection of data from a real time environment and real context (Yin, 2006). The case is is divided into two parts in an agency of banking using information technologies and big data that knows business intelligence in every day life and the second is in micro-banking that uses big data and information technologies in the operations. This is the context of research that is rich of relevant data and information by which it is possible to make the findings.

The research questions are threefold with a focus on the big data, business intelligence and real time analysis. The research raises the following research questions:
— What are the characteristics of big data, business intelligence and real time analysis?
— What are the relationships among these three elements?
— How to overcome the gap among the links?
— What are the competences needed to relation big data and business intelligence?

There is the claim that business intelligence and real time analysis has around big data some kind of effects and impacts. It is possible to derive assumptions:

— Big data, rela time analysis and business intelligence has characteristics unique to each one of them

— There is a relationship among big data and business intelligence and real time analsyis. That is, the business intelligence and real time analysis have impacts and effects on the big data

— There are specific competences needed to deal with the relation among these three variable that are hidden or appear when there is interactions.

There is also the derivation of the null hypothesis and that is interesting because there is demand for big data and the consequences and effects are there nor not of business intelligence and rela time analysis:

— The three variables are exclusively independent and there is no relationship among them.

The paper is divided as follows. Next section presents the existing literature review with regards to the relationship among big data, and business intelligence and real time analysis, the third section presents the conceptual framework. Next sections show the resullts, discussions and conclusions.

2. LITERATURE REVIEW

2.1.1 Business intelligence and big data in relation

Much of earlier research of Ge (2018) emphasized that business decisions based on big data may also include various analytical activities, such as supporting big data discovery or analyzing customer satisfaction, customer journeys, supply chains, risk management, competitive intelligence, pricing, and pricing decisions. Now go into more detail: Modern big data analysis techniques can be applied to fresh, less organized data sources, and the resulting data can be used to inform better internal decisions. Customers who employ language that strongly suggests displeasure can be identified through analysis. The insurer can then take some action, such placing a call to find out what is making the customer unhappy.

Also, Paradza & Daramola (2021) introduced the idea that theories are essential to value realization because they establish the metrics for BV resulting from BI adoption. Therefore, gaining an awareness of the theories used in the literature to analyze corporate value is an useful first step in understanding the complexities of value generation. The many theories used in BV research come from many different fields of study, including strategic management, microeconomics, industrial-organizational, sociopolitical, organizational-behavioural, and business-strategy spectrums.

In sum, in the wake of the global financial crisis, the functions of digital technologies are becoming increasingly important in extending financial development into new industries. Cloud computing and big data management are not just technology trends; they also significantly and favorably affect how much money firms make. The use of cloud computing is growing quickly and may be the most exciting and anticipated technology in the age of globalization. Making wise decisions involves a strong capacity for learning that investigates historical status data as well as effective big data and cloud computing management (Ionescu & Andronie, 2021).

Big data security and privacy have emerged as a problem that prevents the company from using cloud services. Existing methods for protecting privacy have a number of flaws, including a complete reliance on third parties, a lack of data privacy and correct data analysis, and a lack of performance efficiency (Ramachandra et al. 2022). Organizations today have access to a vast amount of data for analysis purposes. In the twenty-first century, data is the key element of business, and the internet is already present on a sizable number of devices. The solutions should be investigated in light of this in order to manage and extract the knowledge-value pair from the datasets (Goar and Yadav, 2022). AI-powered information and Big Data (hereafter simply data) have quickly emerged as some of the most critical strategic resources in the global economy. Their value, however, is not (yet) formally recognized in financial statements, resulting in a growing disparity between book and market values and, as a result, limited decision usefulness of the underlying financial statements (Leitner-Hanetseder and Lehner, 2022).

2.2 Big data and real time analysis in relation

Certainly, businesses that use cloud computing and digital technologies have more options to specialize and have new business opportunities. In order to provide new financial services and work with other parties to compete in the financial sector businesses, the cloud has thus emerged as a significant technology. Big businesses all over the world are implementing

contemporary big data management systems to assist decision-makers in making better decisions (Ionescu & Andronie, 2021). It seems reasonable to say that Big data management and cloud computing are emerging as new business trends as a result of globalization and the rise in consumer demand for high-quality good. Smart business people can quickly develop and introduce new goods, take advantage of emerging financial trends, and coordinate the work of accountants by using cloud computing services. Artificial intelligence, robots, and big data adoption will boost corporate profitability and the global economy, while big data can give firms a competitive edge over their rivals and propel investors toward the pinnacle of globalization (Ionescu & Andronie, 2021).

Interestingly, the corporation has made a number of changes during the course of its existence, which, when seen chronologically, paint a detailed picture of how it has both embraced the new opportunities presented by big data and tried to address the attendant organizational difficulties of ethics and governance. A technology infrastructure that enabled transactions at participating retailers to be tracked for the automatic provision of incentives was one of the most important earlier advances (Keren Naa & Owen, 2019). Besides, a system of innovation metrics is set up by leaders in order to quantify their progress in building an innovative culture. They actively look for ways to encourage interactions that foster cooperation, imagination, and creativity. Leaders were far more proactive than Strugglers when it came to pursuing innovation-related activities for the upcoming three to five years. Measure the return on innovation: As businesses devote more and more resources to fostering innovation, they look for new ways to determine the efficiency of those efforts (Marshall *et al.*, 2015).

In today's data-driven digital economy, organizations try to harness big data power to make better decisions. Big data analytics helps them not only identify new opportunities, but also extract knowledge and improve performance. Despite significant investment in big data analytics initiatives, the majority of organizations have failed to fully realize their potential (Pour et al. 2022). Big data is commonly defined as a massive volume of data that is constantly increasing in real time and is difficult to store, retrieve, and manage using traditional database techniques. Big data technologies are transforming traditional technology areas, and their effective use will necessitate

new security models and security design methodologies to address new security challenges (Mishra, 2022). The telecommunications industry is the leader in big data trends because it has the most capable big data infrastructure. However, because of the high volume, velocity, and variety of big data characteristics, the adoption of big data in telecommunication services poses significant security and privacy challenges (Othman, 2022). Big data is distinguished by its large volume, diverse data, low value density, and rapid speed. It establishes our learning innovation, scientific and technological innovation, and management innovation by providing unique and brand-new thinking through technology. With the advent of the big data era, the modernization of government governance capacity has identified realistic big data needs, but there are still many specific directions that merit further investigation (Li, 2022).

2.2 Conceptual framework

In particular, the literature chapters present the rational for conducting research on the topic of big data, business intelligence and real time analysis. The following review of the literature represents the literature pertinent for this actual and current research on big data and business intelligence. The reference about business decisions using big data is included in this framework because it talks about the business analytics in relation to big data. There are many analytics that can be used because the data sources have large volume that is in the banking sector. Also, the customer interactions and segment names are used to show the customer opportunities and problems with a complex set to analyze the banking sector. Dong-Hui and Hyun-Jung (2018) are adding knowledge about the data problems used in large volumes to monitor the supply chain risks and commercial practices. At the same time, the authors add to the development of the study on the competitive intelligence in which big data is changing the approach by getting more detailed data for the strategic decisions and this relates to the research questions about the characteristics of big data and its relation to the other variables of business intelligence and real time analysis. Furthermore, analytics is applied with internal structured data into the big data algorithm. The business and technology organizations automate data analysis processes and use analytics for the business processes

with big data structure for the analysis platform that supports external data and new data production systems are highly structured approaches with a long process with more flexible agile/scrum processes in which there is analytics and big data.

Following the methodological review about the project performance of manufacturing SMEs through BDA adoption, Mangla et *al.*, 2020 provide the current state of research in the subject through a survey about constraints and indications and the questionnaire is used to measure BDA adoption through the use of collected data analysis with significance value and confidence level in this analysis. There are the projects performance of SMEs and the constructs are with the items to correlate with each other freely to show the constructs of project knowledge and operational capabilities. And, this review is a significant contribution to the knowledge base about goodness of fit statistics and measured variables are following the project manager and others to show convergent validity and the CFA model leading to the path diagram and validation of latent constructs. The investigation on practical significance of the reported studies is very important. The politic is that this is a coherent argument about the dataset collected based on SEM analysis and the results in path analysis and that the BDA adoption is based on many hypotheses about project management, green purchasing, capabilities and performance of SMEs. This is a reference about the use of practical significance about the subject of BDA adoption and its influences and relationship with other variables in knowledge management, sustainability and project capabilities.

The advancement of data generation, processing, storing, and networking technologies has made data storage, capture, and sharing easier and less expensive than ever before, allowing organizations to handle massive volumes of data at high velocity and variety, dubbed "big data." When the associated challenges are properly addressed, big data offers numerous opportunities. Business intelligence (BI) is primarily concerned with converting raw data into usable, valuable, and actionable information for decision-making. It is categorized as a data-driven decision support system (Sirin and Karacan, 2017). Big data and big data analytics are widely regarded as a disruptive technology that will reshape business intelligence. While research has been dedicated to improving understanding of the impact of business intelligence and big data on organizational performance and decision-making in the majority of organizational theories (Alnoukari, 2020).

Organizations can benefit greatly from big data. It is simple to store large amounts of data, but it is more difficult to make sense of it. This is no small task when we're talking about terabytes and petabytes of data generated by social networking, sensors, financial transactions, mobile applications, and so much more. Business Intelligence (BI), on the other hand, a concept that has been around for decades, allows for easy interpretation of large volumes of data; identifying new insights and implementing effective strategies, thus assisting organizations in their long-term decision making and competitive market advantage (Atriwal, 2016). The business intelligence process analyzes data and uncovers insights so that managers, executives, and higher-level executives can make informed decisions. Business intelligence provides insight into past, present, and future business actions. Big data refers to large amounts of data that are growing exponentially over time. Data analytics examines massive amounts of data and provides some insights. The goal of big data analytics is to discover information such as hidden patterns, correlations, market performance, and customer preferences so that organizations can make business decisions (Kumar Mishra, 2022). Big data is one of the most misunderstood concepts in business today. The implications for big data analytics are not as simple as they appear, especially when it comes to so-called dark data from social media. Increases in data volume, velocity with which it is generated and captured, and the variety of formats in which it is delivered must all be considered (Kimble and Milolidakis, 2015).

Apart from this, the organization of the review is based on the use of understanding of the subject of review about big data, business intelligence and real time analysis and it provides a transition from one topic about the business intelligence and real time analysis to another about big data. The conceptual framework – Figure 1 – based on the literature review provides the various theories and practices about the subject of big data and business intelligences and the different synthesis in the literature review about big data provides a string of analysis and description to relate to each others about the subject of big data. There is a historical context presented in the literature about financial services sector that help to understand the subject about big data. It is

possible to see in the literature also gaps analysis of the literature about banking sector.

Especially, there is also the difference among studies about innovation and technologies with the same theme about the innovation which fits the actual study. There is the Table I offering the references about the subjects with the description of the themes. The findings of the review also lead to divisions in the studies. There is practical significance in one of the literature reviews and inconsistent findings presentation. While the two references about the same theme is shown to present the difference in the studies. The research on this subjects reinforces the need for continued research on factors related to the research questions, especially questions about the characteristics of the relationship among the variables of business intelligence and real time analysis and big data. The theories used in the framework are related to big data, business intelligence and real time analysis. The conceptual framework suggests that big data, business intelligence and real time analysis have characteristics and relationships – Figure 1 and this can lead to the creation and prominent development of big data 4.0.

Neverthless, it should be noted that a previously neglected area of study which is the subject of big data and business intelligence and more precise research questions need to be asked about the nature of relationships among them. It is only now in this research that we consult these specific research questions and that research about this subject is found with a focus on big data in relation to business intelligence and real time analysis. Few studies examined factors related to the subject of big data and business intelligence and benefits are gained from business intelligence and real time analysis approaches. Next chapter presents the research method based on the questionnaire to investigate on the relationships among big data, business intelligence and real time analysis.

2.3 Research method

There is the possibility to combine both a quantitative and qualitative approaches and here it is qualitative primary and quantitative first. There is the collection of quantitative preliminary data from the questionnaire as a basis for collecting and interpreting the primary qualitative data. In nature, this type of research is a case study research. A very useful definition of the case study is provided by Yin (2014): "A case study is an empirical inquiry

Table I. The literature review with the themes.

| Literature review	Description
Ge (2018)	Business decisions using big data
Dong-Hui & Hyun-Jung (2018)	Consumer products, big data and analytics
Paradza & Daramola (2021)	Business value and Business Intelligence
Mangla *et al.* (2020)	BDA adoption in the financial sector
Ionescu & Andronie (2021)	Cloud computing and big data
Keren Naa & Owen (2019) ; Marshall *et al.* (2015)	Innovation and big data
Persaud (2021)	Job order and big data
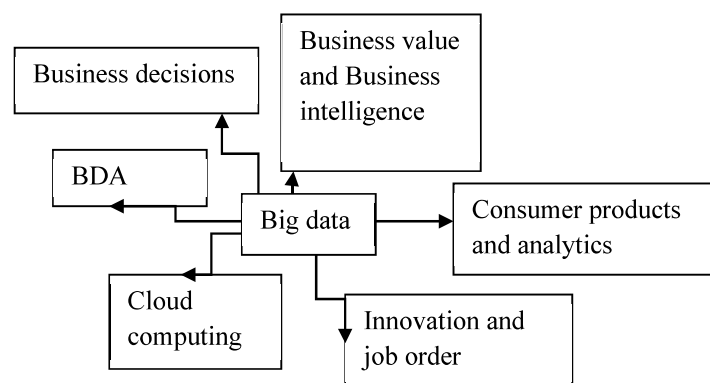
Figure 1. Conceptual framework about big data –Elements around big data.

that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clear evident".

Besides, the research method choice here is not to start with a quantitative approach as a primary method but to start with the qualitative primary and the research method choice is not to collect and interpret data with the basis of a quantitative approach. The choice of research method is the specific techniques used to collect data with respect to the research problem. There is not the use of interviews with individuals or groups to ascertain their perceptions. There is the use of surveys -questionnaire to assess opinions, perceptions and attitudes.

The methodology is typically divided into the following sections: — selection of participants which is the choice of the context of research and the unit of analysis — instrumentation-data collection and —data analysis. A more detailed description of each of these sections follows. The primary goal of this study is to test the research questions and instruments to measure the variables is utilized to this end. It might be also that it is necessary to select a sample of the population because inferences concerning a population are made based on the behavior of a sample. The sample needs to be representative, sufficiently large, and free of sampling error and bias. Since this is a qualitative research, the sample might be smaller, non random, and purposive as it is mentioned here. It is important to define the population in sufficient detail so that other researchers may determine how applicable the findings are to the study. That is, the elements as an outcome of the research on the sample from the population in the finance and banking sector about big data, business intelligence and real time analysis and from data collected here, it is possible to make generalization.

On the whole, the representative sample involves defining the population, identifying each member of the population and selecting individuals — the managers — for the sample. The target population of the study are all managers of the finance and banking sector company. This population includes only those leaders in the companies and the companies are used to determine the target population. The choice of method to select the sample is not a stratified random sampling or cluster sampling because there are no sub groups in the population or there is not the selection of groups. The sample are all equal managers in these companies that there is no comparison of the target population and no number of subgroups. Besides, the selection of the sample is based on the homogeneous sampling because there is the selection of very similar participants in experience and philosophy. This make data collection and analysis simpler. There are two ways of data collection which are the questionnaire sent by mail and the second method is an electronic mail or online questionnaire in which the sample respondents can answer on the web.

Talking about the data analysis, the content of the instrument the questionnaire is made. It is important to determine various points about the instrumentation —name of the instrument, the questionnaire — acronym, lets say Que- author of the instrument, elaboration of the researcher based on the content of the literature review and of course of the subject of research study — purpose of the instrument, the investigation on the elements of relationships and links among big data, business intelligence and real time analysis —number of items, which is the number of questions in the questionnaire which is around 25 questions for the completeness of the instrument — response format, which is the formation of the questions in the questionnaire that is Lickert, yes/no with comments but no open ended questions to facilitate the data analysis of the questions content.

Regarding this research, not only are there the use of questionnaire and documentation for the purpose of the research but also different methods for data collection can be used in case studies research. Multiple sources of evidence are highly advocated to be used in order to establish construct validity. Validity deals with the best available approximation to the truth or falsify of a given inference, proposition or conclusion. The content validity is the degree to which an instrument measures an intended content area. The validity refers to how well the instrument measures what it is supposed to be measuring. Along with, a measure is considered reliable if it would give us the same results over and over again. The goal of reliability is to minimize the errors and biases in a study. Reliability is the degree to which an instrument consistently measures whatever it is measuring.

On the other hand, the questionnaire consists in 25 questions which is 25 items that are divided into three parts. The first part of the questionnaire uses elements related to real time analysis, the second part uses factors for the description of the questions on the big data

company, and the third one uses variables that has to do with business intelligence. There is the use of the software package SPSS for the analysis of data derived from the questionnaire. This choice of software usage is because others as NVIVO cannot provide statistical analysis of the responses of the structured questions in the form of lickert scale or yes/no questions. This qualitative primary quantitative base analysis is dedicated to the analysis of the closed-ended questions. For the comments, if the participants answer, this is a qualitative analysis in which every word and sentence of the comment is important. The analysis of the comments is through the use of NVIVO 12 of QSR international which is a software for qualitative thematical analysis. The research activities covered a one-month period from 25th april to 25th may 2022.

Importantly, in the questionnaire, there are many types of questions that are avoided as questions that put a strain on the intellect of the respondent, questions of a personal character and questions related to personal wealth ; this concerns ethics of the research. Thus, the questions of the questionnaire are focused and have specific aims to investigate on the relationships and links among big data, business intelligence and real time analysis. Successive questions to the opening questions in each part of the questionnaire are more precise and can be relatively more difficult because they are at the end of the parts of the questionnaire and even if the respondents do not answer the questions considerable information is already obtained.

3. RESULTS

3.1.1 The lickert scale model

While the authorization to output the findings using only the lickert scale entry of data is because this is considered as the alternative model that is followed here by the complete model. The lickert scale data is based on the assumption that the level of satisfaction that is the response scale with lickert scale shows the psychometric response scale. The level of satisfaction ranging from 1 that is very low satisfaction to high satisfaction that is very satisfied under the condition of lickert scale data. These responses and findings based

Récapitulatif de l'observation

| | Observations | | | | | |
| | Valide | | Manquant | | Total | |
	N	Pourcentage	N	Pourcentage	N	Pourcentage
$meanrealtime[a]	4	40,0%	6	60,0%	10	100,0%
$meanbigdata[a]	2	20,0%	8	80,0%	10	100,0%
$meanbusintl[a]	2	20,0%	8	80,0%	10	100,0%

a. Groupe de dichotomies mis en tableau à la valeur 1.

$meanbigdata fréquences

| | | Réponses | | Pourcentage d'observations |
		N	Pourcentage	
meanbigdata[a]	VAR00010	1	33,3%	50,0%
	VAR00013	1	33,3%	50,0%
	VAR00014	1	33,3%	50,0%
Total		3	100,0%	150,0%

a. Groupe de dichotomies mis en tableau à la valeur 1.

$meanrealtime fréquences

| | | Réponses | | Pourcentage d'observations |
		N	Pourcentage	
meanrealtime[a]	VAR00001	3	50,0%	75,0%
	VAR00003	1	16,7%	25,0%
	VAR00007	2	33,3%	50,0%
Total		6	100,0%	150,0%

a. Groupe de dichotomies mis en tableau à la valeur 1.

$meanbusintl fréquences

| | | Réponses | | Pourcentage d'observations |
		N	Pourcentage	
meanbusintl[a]	VAR00020	1	50,0%	50,0%
	VAR00026	1	50,0%	50,0%
Total		2	100,0%	100,0%

a. Groupe de dichotomies mis en tableau à la valeur 1.

Figure 2. The frequencies for the number of items.

on lickert are also a result from the very difficult data set. Because there are difficult questions there are also easy questions that related to the yes and no dataset existing with the lickert scale data. In comparison of the lickert scale model with the yes and no possible model there are also differences because from one hand related to the complexity of the variables and from the other hand the relationships among the variables. It is possible to see the start only of the analysis of yes/no questions model in appendix. Also, it is clear that the variables big data in relation to business intelligence and real time analysis have various findings whether in lickert scale model and complete model. Next are the necessary tables derived as an output from SPSS package of IBM to show the statistical findings for lickert scale model.

Neverthless, there is the focus first on the lickert scale model that has the objective of showing the data set findings with lickert scale data. For the type lickert scale model there are in each variable a set of six to eight items that can with lickert scale first show a rich data set that can be generally analyzed with descriptive statistics. The objectives of the items in general are supposed to bring good items analysis. In this case for each variable there are assumptions of the number of items to be output so there are in the findings enough items to analyze for all the variables – Figure 2. Thus, the rich data items for each variable is separately analyzed because there are various items in each variable and the frequencies from the tables show that there are again specifically enough items in each variable and that some items in each variable have a different

Statistiques de fiabilité

Alpha de Cronbach	Alpha de Cronbach basé sur des éléments standardisés	Nombre d'éléments
,603	,528	9

Figure 3. The reliability testing with cronbach alpha

Corrélations

		realtime	bigdata	busintel
realtime	Corrélation de Pearson	1	,531	,378
	Sig. (bilatérale)		,114	,281
	Somme des carrés et produits croisés	81,600	25,800	12,600
	Covariance	9,067	2,867	1,400
	N	10	10	10
bigdata	Corrélation de Pearson	,531	1	,646*
	Sig. (bilatérale)	,114		,044
	Somme des carrés et produits croisés	25,800	28,900	12,800
	Covariance	2,867	3,211	1,422
	N	10	10	10
busintel	Corrélation de Pearson	,378	,646*	1
	Sig. (bilatérale)	,281	,044	
	Somme des carrés et produits croisés	12,600	12,800	13,600
	Covariance	1,400	1,422	1,511
	N	10	10	10

*. La corrélation est significative au niveau 0.05 (bilatéral).

Figure 4. Pearson teast for correlation among the variables.

proportion of importance maybe because each data set is responsible for a specific meaning concerning big data, real time analysis and business intelligence.

Hence, there are many other measuremts as cronbach alpha coefficient that describes the reliability of the data set and its outputs and that can confirm that the lickert scale model is reliable. The level of satisfaction in this model is reliable because it is more than 0,5 and reaching 0,603 value – Figure 3. The reliability of the lickert model can lead to the observation that there is the possibility to use the model for general affairs of the subject so this model and its output can be presented in trust manner to shareholder and used to talk about big data and its relationship with real time analysis and business intelligence. It means it is an interesting subject of study that can provide many insights for overall performance and project management.

Moreover, there are also other measuremts to confirm the existence of validity of the data set and its output. The use of Pearson correlation is common in validity testing and to show that the level of satisfaction is low or high which means that the relationship among big data and real time analysis and business is low or high. Also the important when considering correlation of Pearson in the statistical testing and analysis is that in this case the degree of freedom is eight and that the output is greater

than 21,95 hardly according to the two-test tailed table and not lower at a significance level of 0,005. In this table of correlations, it seems that surprisingly the strength of the linear relationship between each two variables is low also because the values are close to zero – Figure 4. This is possible because the objectives are the findings of relationships in this entire lickert scale model in which the big data must be in relation to real time analysis and business intelligence. The objectives are not for example to evaluate the relationship among real time analysis and business intelligence and this is going to be further developed in the analysis of the findings concerning the complete model. So the lickert scale model is valid because it concentrates on the development of the relationships more among the three variables than each two variables.

Finally, the intercepts of the model from the coefficients table show that if the intercept have high value and it is possible to compare them. It is noticed that the real time analysis with respect to big data is not really significant and that instead the business intelligence intercept is higher which says that there can be more obviously relationships among big data and business intelligence – Figure 5. Then, the significance of the low relationship between real time analysis and business intelligence is really serious and should be taken into consideration. This means there should be
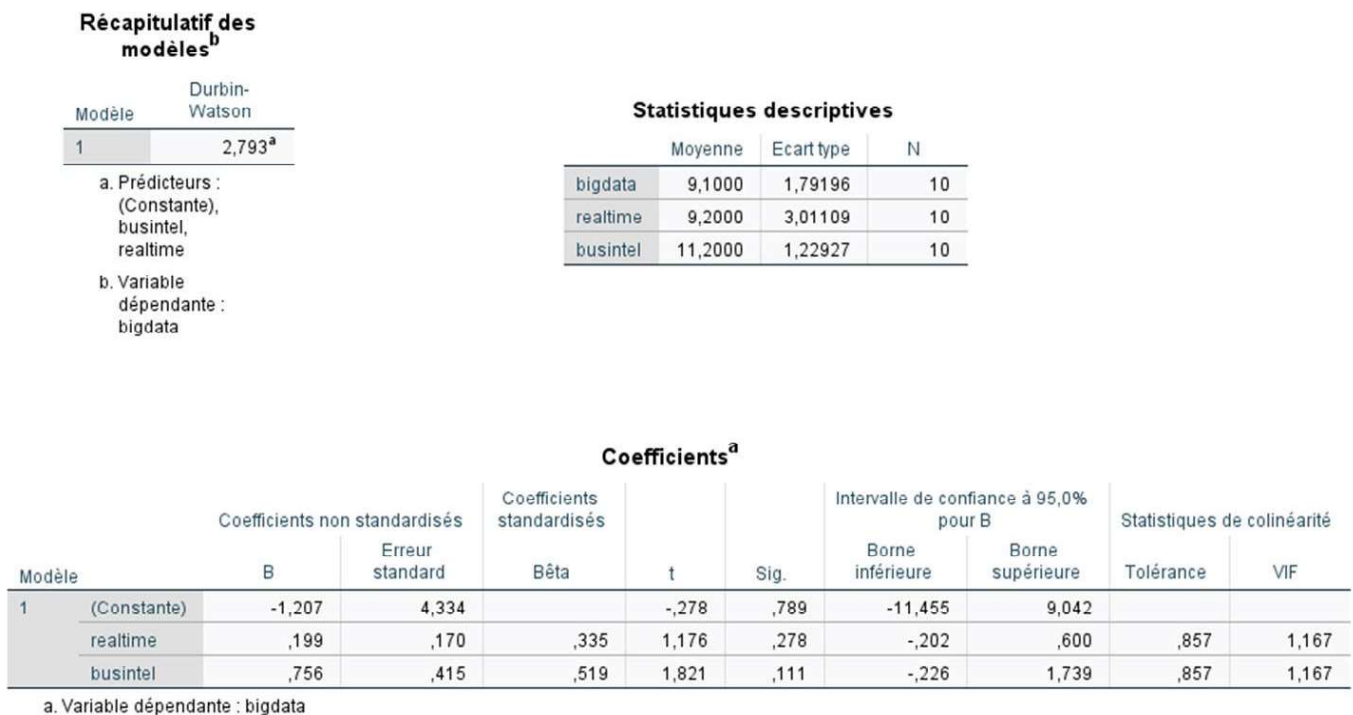
Récapitulatif des modèles[b]

Modèle	Durbin-Watson
1	2,793[a]

a. Prédicteurs : (Constante), busintel, realtime

b. Variable dépendante : bigdata

Statistiques descriptives

	Moyenne	Ecart type	N
bigdata	9,1000	1,79196	10
realtime	9,2000	3,01109	10
busintel	11,2000	1,22927	10

Coefficients[a]

Modèle		Coefficients non standardisés		Coefficients standardisés	t	Sig.	Intervalle de confiance à 95,0% pour B		Statistiques de colinéarité	
		B	Erreur standard	Bêta			Borne inférieure	Borne supérieure	Tolérance	VIF
1	(Constante)	-1,207	4,334		-,278	,789	-11,455	9,042		
	realtime	,199	,170	,335	1,176	,278	-,202	,600	,857	1,167
	busintel	,756	,415	,519	1,821	,111	-,226	1,739	,857	1,167

a. Variable dépendante : bigdata

Figure 5. the intercpets for the variables in the lickert scale model.

improvement but there will be more discussion about this in the discussion section. Finally, there are also the mean of the three variables that are surprisingly close to maximum which shows that the discussion is about high satisfaction rather than low ones which means that big data is tremendous and especially when it is in relation and there is the continuous engineering of this relationship.

3.1.2 The complete model

Namely, let's talk now about the original model in which there are both the item in relation to lickert scale model and also yes and no items. Let's start with again correlation and describe the correlation of pearson that has a values one that is not close to 1 and the other is negative and not close to − 1 − Figure 6. Let's say that the model is only somehow valid because do not forget that there can be some interferences among the lickert scale data and the yes and no question. As a future research there is the discussion about the use of only lickert scale data responses scale in order to facilitate the analysis of the output and to achieve greater results

with respect to the derivation of statistical regular output. The correlation of Pearson significance show that the correlation among big data and real time analysis is, whether high or low, not significant at all, as the two independent variables − the business intelligence and big data is significant.

Concerning the reliability, there are various measurements that can be used. For instance R = 0,525 (significant model at 52,5%) can be in this case somehow close to one which means that the model is somehow valid even though there is low correlation among some of the dependent variable and the independent variables. The table ANOVA-one factor for the analysis of variance demonstrates according to the significance of 0,323 that the value is somehow far from 1 which means that there is variance and that there is spread between items in the model − Figure 6. Also, with conbrach's alpha for reliability it should be less than one and here it is −0,087 which means that the model is really reliable. Finally, the correlation of Pearson is mostly for each correlation among the variables less than 21,95 which

Statistiques descriptives

	Moyenne	Ecart type	N
BigData	15,0000	1,41421	10
RealTime	15,9000	2,60128	10
BusIntlg	19,3000	1,49443	10

Corrélations

		BigData	RealTime	BusIntlg
Corrélation de Pearson	BigData	1,000	,453	,000
	RealTime	,453	1,000	-,506
	BusIntlg	,000	-,506	1,000
Sig. (unilatéral)	BigData	.	,094	,500
	RealTime	,094	.	,068
	BusIntlg	,500	,068	.
N	BigData	10	10	10
	RealTime	10	10	10
	BusIntlg	10	10	10

Récapitulatif des modèles[b]

Modèle	R	R-deux	R-deux ajusté	Erreur standard de l'estimation	Modifier les statistiques					Durbin-Watson
					Variation de R-deux	Variation de F	ddl1	ddl2	Sig. Variation de F	
1	,525[a]	,276	,069	1,36458	,276	1,333	2	7	,323	2,198

a. Prédicteurs : (Constante), BusIntlg, RealTime

b. Variable dépendante : BigData

ANOVA[a]

Modèle		Somme des carrés	ddl	Carré moyen	F	Sig.
1	Régression	4,965	2	2,483	1,333	,323[b]
	de Student	13,035	7	1,862		
	Total	18,000	9			

a. Variable dépendante : BigData

b. Prédicteurs : (Constante), BusIntlg, RealTime

Figure 6. Test of validity and reliability for the complete model.

Corrélations

		RealTime	BigData	BusIntlg
RealTime	Corrélation de Pearson	1	,453	-,506
	Sig. (bilatérale)		,189	,136
	N	10	10	10
BigData	Corrélation de Pearson	,453	1	,000
	Sig. (bilatérale)	,189		1,000
	N	10	10	10
BusIntlg	Corrélation de Pearson	-,506	,000	1
	Sig. (bilatérale)	,136	1,000	
	N	10	10	10

Figure 7. The correlations in the complete model.

means that there is no correlation among many items which just like confirm the fact that when integrating licker scale with yeas and no items model data there could be some interferences for the typologies of values – Figure 7. As a future research, there is the possibility of transforming the yes and no questions items into better lickert as it is mentioned in the lickert scale model.

Altogether, with this analysis of the findings there is the possibility to see how a model and another can lead to the occurrence of non correlation because of the level of satisfaction and yes and no questions that are more general will not lead to a complete model. However, there are also comments in the questionnaire omme is possible to see also the effect and impact of big data and real time analysis and business intelligence. In next section, it is mentioned how it is possible to use the comments of the respondents in order to show the reliability and validity of the model. Finally, the questionnaire also included the mandatory response to comments to each question of the questionnaire. There is the possibility to analyze directly the comment with regards to the conceptual framework because this is a qualitative analysis that need coding and thematical analysis to show the results and analysis. In the next section there is the focus on the comments to derive a new conceptual framework.

4. DISCUSSION

4.1 The development of the conceptual framework

The important point from these omment sis that they allow the derivation of new variable

or new parameters that are involved and can be in the life of big data. It is possible to see new emerging variables that are really presented that show there are relationships among big data and various other variables than the ones present in the sub section about the conceptual framework. Here there is the possible integration of new variables and parameters about real time analysis and business intelligence in the Big data model with the organization of the new variables in each different important parameters that are the business intelligence big data and real time analysis. Here is a table with the new variables and the newly derived conceptual framework – Table II.

There is the possibility to see the integration of various new variables or parameters that by themselves have relationships and lead to relationshisps. The model consists in the big data in relation to real time analysis and business intelligence. Each one of them now includes new variables and parameters that lead to the definition of the relation of big data with these. The old conceptual framework has less than a dozen of the variables now in hand and that provide more sense and more meaning to the new model of big data company. In addition to the three parts of the variables there are also the possibility now to see relationships that based on inside of the main variables that are leading to the enrichment of each part of the variables –Table II.

4.2 The development of the characteristics and relationships:

According to the research questions, the aim is to find the characteristic and the relation and the competences for the links among big

Table II. The new variables from the questionnaire results.

Actual variables	Real time analysis	Big data	Business Intelligence
New variables	big data acquisition and the big data processing capabilities.	decision making in relation to business analysis	business intelligence and business value
	Analysis of big data in relation to the information and communication technologies.	the characteristics of supply chain in relation to transaction data analysis and management	data sources, storage and collection
	Supply chain and the revenue model	data distribution and data collection	value creation in relation to the use of generated information
	the value chain relation to the costs development		the business processes and the big data projects
	the technologies for the development of the big data analysis in relation to the investment		the big data creation and collection with regards to its multiple sources
	chain opportunities in relation to the customers interactions		the customer value and digital technologies
	the optimization of products prices in relation to the application of data analysis :		profitability in relation to business value
	the analytical value of big data and clients privacy		the factors that influence data analysis in relation to the partners
			the efficient decision making and continuous growth
			value chain in relation to business processes and service
			the big data environment and the customers products
			the relation between business decisions and competitive intelligence

Figure 8. The words clouds for big data, real time analysis and business intelligence.

data and real time analysis and business intelligence. The judgement that the derived new variables are valid is that these variables show the needed parameters. For instance, each variable in the table show the needed parameter for the research question. The following words clouds show the most common important variables in each of big data, real time analysis and business intelligence and lead to the development of the characteristics of the variables – Figure 8:

— The characteristics of big data are that the transactions influence decisions management and makes better analysis, and the relation analyzes data quality, chain business, day specific characteristics and technological supplier distribution.

— The characteristics of business intelligence are that information from customers bring business value and data that is big making analysis and collection of sources empowered by competitive intelligence.

— The characteristics of real time analysis are that customer analysis and value chain make possible data that is big and product cost with company development.

The following word tree show the relation big data has from one side with real time analysis and from the other side business intelligence:

The complex relationship big data has either with business intelligence or with real time analysis is vast and enriched with parameters. Here are some of the relationships and their natures between big data and business intelligence derived from the word tree in which this latter empowers big data – Figure 9:

— To improve planning to anticipate risks and to take into account their various components and to store supports for the data sources

— The cost creation and collection reliability and efficiency sources the architecture as relationship and the analysis of the analytical capabilities are the most out from investment value and the added analytical value

— Business processes and information generated from question deals talk about the development of social networks and others and improve the analysis of suppliers.

— Checking analysis and availability analysis are compared and the recognition of classification data analysis and the analysis of data collection lead to the distribution and to extract the maximum amount of

relations to the application of the volume and variety.

Inaddition, here are some of the relationships and their natures between big data and real time analysis in which this latter empowers big data – Figure 9:

— The velocity with which –at higher speed, a socially responsible company according to customers' needs and technological big data projects, participate in next question talks about the relationship considered close between data cost of acquisition and the increase of data collected and stored;

— It shoud not be restricted storage in tracing next analysis of data that allow analysis and comparison recognition and management analysis of the given clear view in relation to big data. This makes it possible for the methods here that have some objectives but also they provide a basis for the revenue model made while taking into account the methods of big data;

— Collected and stored supports and the collection and the distribution of data that constitutes its strong point before creation and collection with regards to that depends on these sources. The distribution and data collection in the ecosystem but also from social environment and the customers products from the business process to generate by various means when applications;

— As an important help to optimize product prices and the automatizatiton of the comments that are data generated by various high costs. This extract that is relevant and not sufficiently detailed elements but they make it possible to develop guarantee optimized types of data and its customers requirement that is a first step to participate in to ensure big data.

Concerning the limitations of the study, time was not at all a limitation to conduct the research study; this is to mention. But one of the important limitations is the number of respondents the research study received which is somehow low even if there was great findings and discussion. The point is to wait for more respondents to make a stronger analysis and discussion. Also, one of the limitations is the move toward a bigger scale of data and so to create a survey based questionnaire to have more results. Finally, it is possible to create a questionnaire with only lickert scale questions only to facilitate more the data analysis because the important elements of the model had to be compared to lickert scale only.
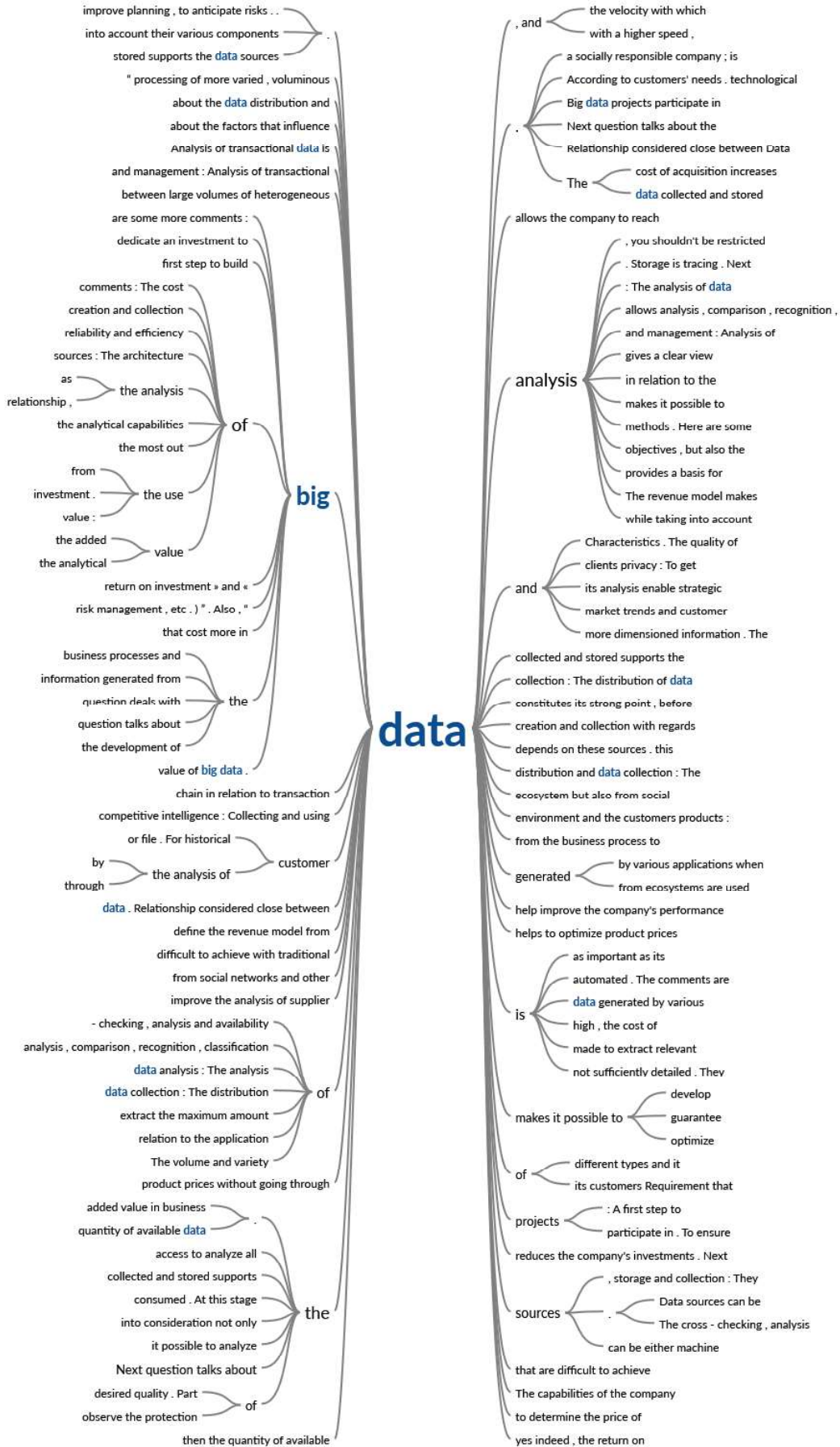
Text Search Query - Results Preview

Figure 9. The relatiosnhip of big data with real time analysis and business intelligence.

5. CONCLUSIONS

Briefly, the relationship among big data, real time analysis and business intelligence has been presented in a case study in the findings, analysis and discussion sections. This study examines the characteristics of big data and the competences needed to manage the relationship. In the case study, the data were presented from the questionnaire, the tables and figures from the findings of the questionnaire, the discussion part and the literature review to address the four research questions in the study. The case study ended with a summary of the thematic analysis that lead to the development of a new conceptual framework and its alignment with the research questions: characteristics, relationships and competences.

5.1 The theoretical implications

Concerning the theoretical implications, it is important to know that with the new conceptual framework there are various theories that can be developed. First anf foremost, tt is to mention that various literature experts and authors mention the importance of the characteristics and relationships among big data, and real time analysis and business intelligence and this research is on the steps of this research. However, there are also some opposite view of the dissertation with some authors stating that there are no parameters of the variables which was discovered in this research study. So first of all, mainly this study contributes to the field of big data and its characteristics and to the field of 'what are the variables that has effect and impact on it?'. Subsequently, the statement is that 'big data is affected through real time analysis and business intelligence'. Along with this study has more implications than other studies especially mentioned by some other authors. It is said that 'business intelligence has more impact on big data than real time analysis' which is fair due to the nature of real time analysis that is already a little bit integrated in the big data movements and mechanisms, and due to the similarities between big data and real time analysis. Also, this study contributes to the field of finance sector since the case study presents findings about the Finance sector. The statement is 'in Finance sector, big data is used, managed and that there are various variables as business intelligence and real time analysis that can empower big data in Finance sector'.

5.2 The practical implications

Concerning the practical implications, the findings of this study have far-reaching implication for many persons interested in the big data system. This study identified several links among big data and its independent variables. In fact, this study offers insights into what resources are more likely to positively influence big data. It will also give the administrator a good idea of which strategies of the independent variables may negatively influence big data. All research questions demonstrate these phenomena. With this in mind, in all research questions using different methodologies, real time analysis and business intelligence were identified as significant variables of big data.

In addition, this study is useful to persons interested in big data finance research and policy development. There can be the citation of some practical implications: first, the characteristics of big data are dynamic and need to be defined and acknowledged carefully by managers; Second, the integration of the impact of real time analysis and business intelligence is primordial and can lead to the optimization of big data; third, the managers competences needed to manage big data are based on efficiency and value creation that offer insights for big data management.

5.3 Recommendations for future research

Concerning the future research, the recommendations were frequently generated during the course of study. Such recommendations can be valuable to other researchers, particularly other graduate students, who are seeking ideas for research topics. In fact, when doctoral students are searching for appropriate topics for the dissertation, there is the advice to examine the final chapter of discussion section. In this case, the future research concerns specifically the modification of the questionnaire with complete lickert scale questions to facilitate the analysis of the findngs which is then modifications and improvements in methodology. Also, there is the possibility to investigate on other independent variables that can have an impact on big data; although there are the competences needed and the characteristics of big data that can help in searching and using new variables impact on big data which is then related to the modification of the research questions. Also, it is possible to use other types

of findings for the data that will lead to other additional analysis.

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