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Survey of recent advancement in big data analytics for business operations and risk management prospective

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Abstract
Big data analytics would definitely lead to valuable knowledge for many organizations. Business operations and risk management can be a beneficiary as there are many data collection channels in the related industrial systems (e.g., wireless sensor networks, Internet-based systems, etc.). Big data research, however, is still in its infancy. Technological development and advances for industrial-based business systems, reliability and security of industrial systems, and their operational risk management are examined. This paper aims to focus performing different analysis of business operations and risk management.

Keywords
Big data analytics, Business intelligence (BI), Operational risk analysis, Operations management, Systems reliability and security.

1.Introduction
Information technology (IT) not only introduces convenience however creates several new improvement opportunities that were not possible within the past. For instance, advances of business intelligence (BI) strategies and data processing techniques have brought vast enhancements to trendy business operations. Nowadays, within the "big data era," a vast quantity of information is offered for every kind of commercial applications. for instance, the cloud service may be thought of as an information warehouse that provides a useful supply of information.

Big information has become the new frontier of information management given the quantity of data today's systems are generating and overwhelming. For activities like accesses to information, social networking, mobile computing and commerce. Corporations and governments have begun to acknowledge that there are unexploited opportunities to enhance their enterprises that may be discovered from this information. Analytics once applied within the context of huge information is that the method of examining large amounts of information, from a various range of information sources and in numerous formats, to deliver insights that may modify choices in real or close to real time. huge information analytical approaches is used to recognize inherent patterns, correlations and anomalies which might be discovered as a results of group action huge amounts of information from completely different data sets.

Wireless sensor networks [e.g., radio frequency identification (RFID), near field communications] can be used to collect useful data ubiquitously an evolving topic on the internet of things (IoTs), that consists of devices capable of communication via the net surroundings, additionally provides a platform for gathering a vast quantity of information. In different words, it's currently easier to gather information than ever before. That being said, extracting and utilizing useful data from such vast and dynamic databases for "big data" is way from straightforward. Since these information are connected to time period events, they will be used, if properly (e.g., via BI schemes), for rescheduling or replanning activities in business applications that finally reduce the amount of risk and improve gain and efficiency of the operations. This undoubtedly will supplement traditional optimization techniques that are a priori in nature. For example, thought-about a dynamic employment scheduling drawback with the assistance of big information hold on in distributed cloud services.

Analytics once applied within the context of huge information is that the method of examining giant amounts of information, from a spread of information sources and in several formats, to deliver insights that may modify choices in real or close to real time. Varied analytical ideas like data processing, natural language process, AI and predictive analytics will be used to analyze, contextualize and visualize the information of data from fully different data sets.

2.Literature survey
In [1] Tsan-Ming Choi et al. said that there is sufficient supporting evidence to conclude that data-driven approaches would be a growing research methodology/ philosophy in business operations. Numerous applications domains are often influenced by this massive information trend. Bi systems are definitely on the list intrinsically systems extremely

believe the input file to get valuable outputs. That being same, the scope of Bi systems is thus wide and connected analysis concerned the multidisciplinary data. Thus it's not surprising that the analysis focal points are scattered around completely different disciplines. Accordingly, it's challenging to generalize the results from previous studies. During this association, rising big-data-oriented analysis may have some changes. Synergizing multiple analysis methodologies may be one direction. Data mining is still the core engine of BI systems but previous data mining algorithms are very application-oriented. This is not a criticism but an observation. The main reason is due to the nature of the data involved. So, soft computing techniques may be more applicable in this regard. In addition, coupling with the big data era, it may be the right time to think about mining ontologies, rather than just algorithms. There are many applications of big data in industrial systems reliability and security. However, very few prior studies focus on the security of the "information and communication technology" (ICT) supply chain. It is critically important as it is the base of all the applications. ICT mediated supply chain is the necessary carrier of big data as it produces all the software, hardware, and information infrastructure for big data's collection, storage, and application. So in the future, authors need to address the reliability and security problems that an ICT mediated supply chain faces. To be specific, it is important to construct the evaluation index systems and early warning systems for systems reliability and security management. It is also critical to explore the measures which can properly deal with security breaches. In addition, as revealed by our analysis, more emphasis should be paid on achieving systems optimality (i.e., examining the whole picture from the perspective of the enterprise).

In [2] Naresh Manwani et al. showed that these convex loss functions are not noise tolerant. Risk minimization under hinge loss, exponential loss and log loss is not noise tolerant even under uniform label noise. This explains the problem one faces with algorithms such as SVM if the class labels given are sometimes incorrect. Authors also showed that the linear least squares approach is noise tolerant under uniform noise but not under non-uniform noise. Same is shown to be true for Fisher linear discriminate. Most algorithms for learning classifiers focus on minimizing risk under a convex loss function to make the optimization more tractable. The analysis presented in this paper suggests that looking for techniques to minimize risk under 0-1 loss function may be a promising approach for classifier design especially when authors have to learn from noisy training data.

In [3] Hsinchun Chen et al. analyze through BI&A 1.0 initiatives, businesses and organizations from all sectors began to gain critical insights from the structured data collected through various enterprise systems and analyzed by commercial relational database management systems. Over the past several years, web intelligence, web analytics, web 2.0, and the ability to mine unstructured user generated contents have ushered in a new and exciting era of BI&A 2.0 research, leading to unprecedented intelligence on consumer opinion, customer needs, and recognizing new business opportunities. Now, in this era of Big Data, even while BI&A 2.0 is still maturing, authors find ourselves poised at the brink of BI&A 3.0, with all the attendant uncertainty that new and potentially revolutionary technologies bring. This MIS Quarterly Special Issue on Business Intelligence Research is intended to serve, in part, as a platform and conversation guide for examining how the IS discipline can better serve the needs of business decision makers in light of maturing and emerging BI&A technologies, ubiquitous Big Data, and the predicted shortages of data-savvy managers and of business professionals with deep analytical skills. How academic can IS programs continue to meet the needs of their traditional students, while also reaching the working IT professional in need of new analytical skills? A new vision for IS may be needed to address this and other questions. By highlighting several applications such as e-commerce, market intelligence, e-government, healthcare, and security, and by mapping important facets of the current BI&A knowledge landscape, authors hope to contribute to future sources of knowledge and to augment current discussions on the importance of (relevant) academic research.

In [4] Wullianallur Raghupathi et al. discuss about Big data analytics has the potential to transform the approach health care suppliers use refined technologies to realize insight from their clinical and different information repositories and build informed selections. Within the future authors will see the speedy, widespread implementation and use of huge information analytics across the health care organization and also the tending trade. To that finish, the many challenges highlighted higher than, should be addressed. As huge information analytics becomes additional thought, problems like guaranteeing privacy, safeguarding security,

establishing standards and governance, and frequently up the tools and technologies can garner attention. Massive information analytics and applications in tending are at an emergent stage of development; however speedy advances in platforms and tools will accelerate their maturing method.

In [5] Nezih Altay et al. said that the new directions for OR/MS analysis, disaster operations management show tremendous potential. Disasters have hit, and can continue striking our communities, businesses, and economies. It's in everybody s interest to know however authors will manage them effectively and with efficiency. Higher management of disaster operations can improve readiness, increase response speed, and ease recovery. Authors have got surveyed the OR/MS literature to spot publication trends, problems ought to have additional investigation, and issues that haven't however been examined.

In [6] Kannan Govindan et al. proposed a completely unique metaheuristic technique termed as MOHNS, which combines the revised NSGA-II and APBSA, is projected to yield the optimum redundancy allocation for the multiobjective drawback. As authors have mentioned earlier, the problem that authors explored during this paper is new and is a lot of general than several different existing studies. The most sensible feature of this formula is shown in 2 aspects: initial, it uses a unified archive that paves the ground for conserving the solutions that may be lost throughout the elimination method when the search method. Second, it employs a unique conception referred to as desirability in APBSA that avoids finding the nonoptimal resolution within the local optimum.

In [7] Mark S. Beasley et al. study focuses specifically on such factors. Companies within the US have lagged behind the remainder of the industrialised world in ERM advancement.2 motivated by various company financial news scandals company and stakeholders demand for larger oversight of key risks, there's increasing importance on the extent that a corporation implements ERM. Beasley, Clune, and Hermanson examine the adoption of enterprise risk management (ERM) as a model for managing the many risks that organizations confront beside the reasoning behind a company's implementation of ERM. The extent of ERM implementation among a firm was measured on a one to five scale based mostly upon the respondent's response to a survey question concerning degree of ERM readying. The authors of the study targeted each on the adoption of ERM that is changing into the norm in large public companies, however additionally on however advanced corporations were in ERM implementation. The study found that ERM implementation is completely correlative to the presence of a chief risk officer, board independence, CEO and CFO support, presence of massive four auditors, and entity size.

In [8] Mohd Nishat Faisal et al. research presents a hierarchy-based model and also the mutual relationships among the enablers of risk mitigation. Offer chain risk management assumes importance within the wake of organizations understanding that their risk status relies on different constituents of their offer chain. The aim of this paper is to present associate approach to effective offer chain risk mitigation by understanding the dynamics between varied enablers that help to mitigate risk during a offer chain.

Table 1 Research publication

S.No.	Authors Name	Paper Title	Publication	Proposed system
1	Tsan-Ming Choi et	Recent Development in Big Data Analytics for Business Operations and Risk Management	IEEE 2016	Developed business operation and risk management
2	Naresh Manwani, P. S. Sastryet al.	Noise Tolerance Under Risk Minimization	IEEE 2013	Showed that the linear least squares approach is noise tolerant under uniform noise but not under non-uniform noise.

S.No.	Authors Name	Paper Title	Publication	Proposed system
3	Hsinchun Chen et al	Business Intelligence And Analytics: From Big Data To Big Impact	JSTOR 2012	discuss the MIS Quarterly Special Issue on Business Intelligence esearch First provides a Framework that identifies the evolution, applications, and emerging research areas of BI&A
4	Wullianallur Raghupathi et al.	Big data analytics in healthcare: promise and potential	Health information science and systems 2014	Proposed Big data analytics has the potential to transform the approach health care suppliers use refined technologies to realize insight from their clinical and different information repositories and build informed selections
5	Nezih Altay et al.	OR/MS research in disaster operations management	Elsevier 2006	The new directions for OR/MS analysis, disaster operations management show tremendous potential.
6	Kannan Govindan et al.	Optimal Bi-Objective Redundancy Allocation for Systems Reliability and Risk Management	IEEE 2015	Proposed a novel metaheuristic method termed as MOHNS, which combines the revised NSGA-II and PBSA, is proposed to yield the optimal redundancy Allocation for the multiobjective problem
7	Mark S. Beasley et al.	Enterprise Risk Management: An Empirical Analysis of Factors Associated with the Extent of Implementation	Elsevier 2005	examine the adoption of enterprise risk management (ERM) as a model for managing the numerous risks that organizations confront along with the reasoning behind a company's implementation of ERM
8	Mohd Nishat Faisal et al.	Supply chain risk mitigation:modeling the enablers	Business Process Management Journal 2006	Presents a hierarchy-based model and the mutual relationships among the enablers of risk mitigation.

3.Big data analytics

Big Data and Big Data Analytics are two very similar yet different things. Big Data is a concept that does ring a bell with many professionals nowadays and strongly gains popularity and adoption. It is often defined on the basis of the 3V-model, as figure 1 shows. A once very structured dataset has now become a combination of structured and unstructured data in all kinds of formats and the velocity of data exposure, data acquisition and data processing has gone from batching towards streaming. In se, the amount, speed and diversity of data define the concept Big Data, but there are other factors that must be considered.

The continuously evolving data have a great impact on companies and their way of doing business. The mass of available and often unstructured data has a priceless value; provided that it is processed and analyzed correctly, after which decision makers can elaborate appropriate business actions. Here, a first problem comes into the picture. Nowadays, many companies collect lots of data, but they are struggling to process them correctly, let alone that they can analyze them correctly or to connect the right business actions to it.

Big Data Analytics has four key drivers, as depicted on Figure 2 (Liberatore & Luo, 2010). These four drivers each have a strong independent effect on the outcome of the analysis, but when taken into account together and through their interactions; they are a powerful force leading to the growth on the analytic organization.

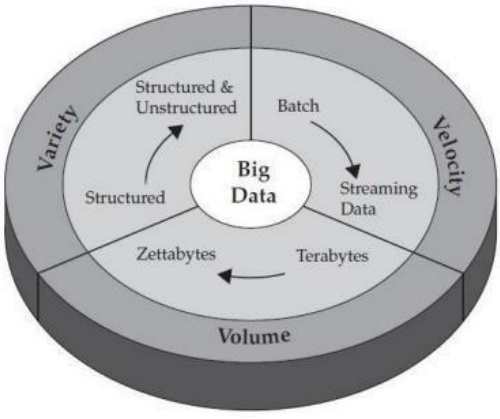

Figure 1 the 3V-Model

The data aspect is self-evident and is already depicted in the paragraphs above, as this is the handhold between Big Data and Analytics. The people that are needed to bring analytics to a good end need to be highly technology-minded and need a strong analytical mindset in order to cope with all the data. They need to automate getting insights out of the data via certain software.

Figure 2 Four key drivers of big data analytics

There are many simple statistical and optimization tools out there, but in order to be doing some "real" Big Data Analytics, a more advanced software package is often needed. The fourth key driver emphasizes the need for a process orientation to better understand the tasks that comprise the firms' businesses. This process orientation has to align the analysis tasks with the corporate objectives. This is important to make progress and not continuously being stuck in the same endless cycle of executing irrelevant tasks. By keeping an eye on the objectives, the three E's can be realized: Efficiency, Effectiveness and Economy.

4.Conclusion

This brief study on the topic of big data analytics attempts to illustrate the recent research work that has been done in the field. Some research papers were discussed all focusing on different aspects and techniques of big data analysis. All algorithms have some prons and cons of their own and this can be gleaned from the review. Although no experiment comparisons were made the essence of the reviewed papers has been presented. In this paper we study of the Recent Development in Big Data Analytics for Business Operations and Risk Management.

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