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MAKE LOGISTICS SMARTER: USING BIG DATA

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Abstract

Information and Communication Technology (ICT) has been providing effective and efficient path for the enhancement of each every business. ICT are now a days generating a rate that doubles the data every two years. In this VUCA (Volatility, Uncertainty, Complexity and Ambiguity) world, organizations are competing with each other for effective usage of logistics performance.

This paper focuses on **"Relevance of big data to logistics function and its utilization formaking logistics smarter"**.

A big data centric architecture for logistics has been proposed as current state of the art and technology of data management, analytics and visualization. The privacy requirements of the big data and the security system for the data management have also been discussed and several mechanisms for implementation have been highlighted.

Introduction

In recent years the logistics plays a vital role make the entire business all over the world more efficient. While it coined with Information and Communication Technology(ICT) the level of accuracy and efficiency has reached a tremendous growth and makes the entire business enhancement process in a faster way.

Big data is a term for data sets that are so large or complex that traditional data processing applications are inadequate to deal with them. Challenges include analysis, capture, data carnation, search, sharing, storage, transfer, visualization, querying, updating and information privacy. The term "big data" often refers simply to the use of predictive analytics, user behaviour analytics, or certain other advanced data analytics methods that extract value from data, and seldom to a particular size of data set.[1] "There is little doubt that the quantities of data now available are indeed large, but that's not the most relevant characteristic of this new data ecosystem."[2]

Analysis of data sets can find new correlations to "spot business trends, prevent diseases, combat crime and so on".[3] Scientists, business executives, practitioners of medicine, advertising and governments alike regularly meet difficulties with large data-sets in areas including Internet search, finance, urban informatics, and business informatics.

Scientists encounter limitations in e-Science work, including meteorology, genomics,[4] connectomics, complex physics simulations, biology and environmental research.[5]

Big data can be described by the following characteristics:[6][7]

Volume

The quantity of generated and stored data. The size of the data determines the value and potential insight- and whether it can actually be considered big data or not.

Variety

The type and nature of the data. This helps people who analyze it to effectively use the resulting insight.

Velocity

In this context, the speed at which the data is generated and processed to meet the demands and challenges that lie in the path of growth and development.

Variability

Inconsistency of the data set can hamper processes to handle and manage it.

Veracity

The quality of captured data can vary greatly, affecting accurate analysis.

Due to the advancement of ICT data's are generated at an exponential rate. Big data describes a holistic information management strategy that includes and integrates many new types of data and data management alongside traditional data.

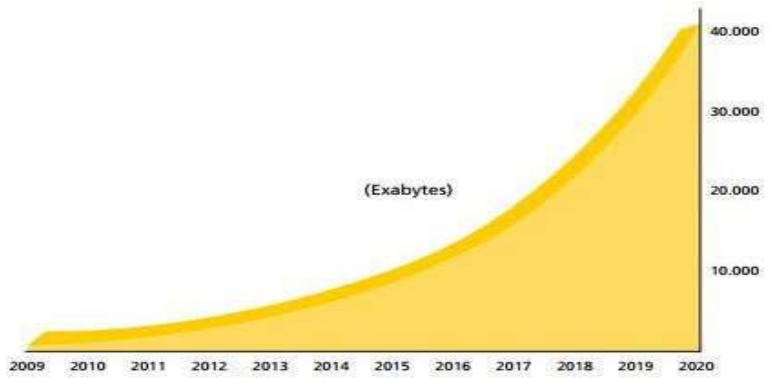


Figure 1: Exponential data growth between 2010 and 2020; Source: IDC's Digital Universe Study, sponsored by EMC, December 2012

With these kinds of data we can interpret and analyze and also gain deep insight about

- What happened?
- Why did it happen?
- What is likely to happen?
- What should i do about it?

Logistics Big Data :

Logistics is generally the detailed organization and implementation of a complexoperation. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics can include physical items such as food, materials, animals, equipment, and liquids; as well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, material handling, production, packing, inventory, transportation, warehousing and often security.

In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenceless. Military logistics was already practiced in the ancient world and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed.

Logistics management is the part of supply chain management that plans, implements,and controls the efficient, effective forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. The complexity of logistics can be modelled, analyzed, visualized, and optimized by dedicated simulation software. The minimization of the use of resources is a common motivation in all logistics fields. A professional working in the field of logistics management is called a logistician.

For the past few years the entire world is evolving smarter and faster using Information and Communication Technology (ICT) and coined with Logistics.

Logistics and Big Data are a Perfect Match

The logistics sector is ideally placed to benefit from the technological and methodological advancements of Big Data. Today logistics providers manage a massive flow of goods and at the same time create vast data sets. For millions of shipments every day, origin and destination, size, weight, content, and location are all tracked across global delivery networks. But does this data tracking fully exploit value? Probably not.

Most likely there is huge untapped potential for improving operational efficiency and customer experience, and creating useful new business models. Consider, for example, the benefits of integrating supply chain data streams from multiple logistics providers; this could eliminate current market fragmentation, enabling powerful new collaboration and services. Many providers realize that Big Data is a game changing trend for the logistics industry.

In a recent study on supply chain trends, sixty percent of the respondents stated that they are planning to invest in Big Data analytics within the next five years4 (see Figure 2 below). However, the quest for competitive advantage starts with the identification of strong Big Data use cases. In this paper, we first look at organizations that have successfully deployed Big Data analytics in the context of their own industries. Then, we present a number of use cases specific to the logistics sector

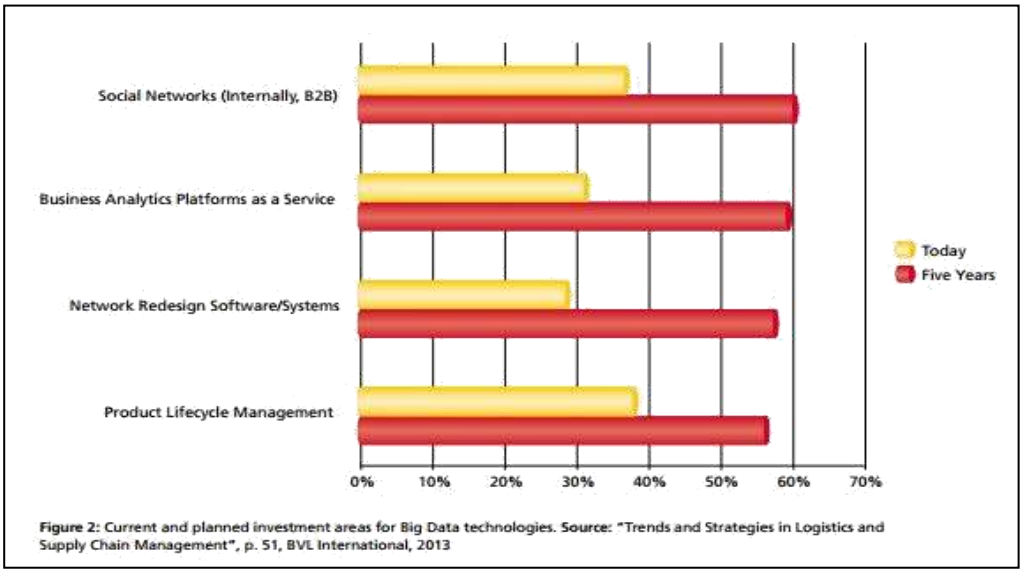
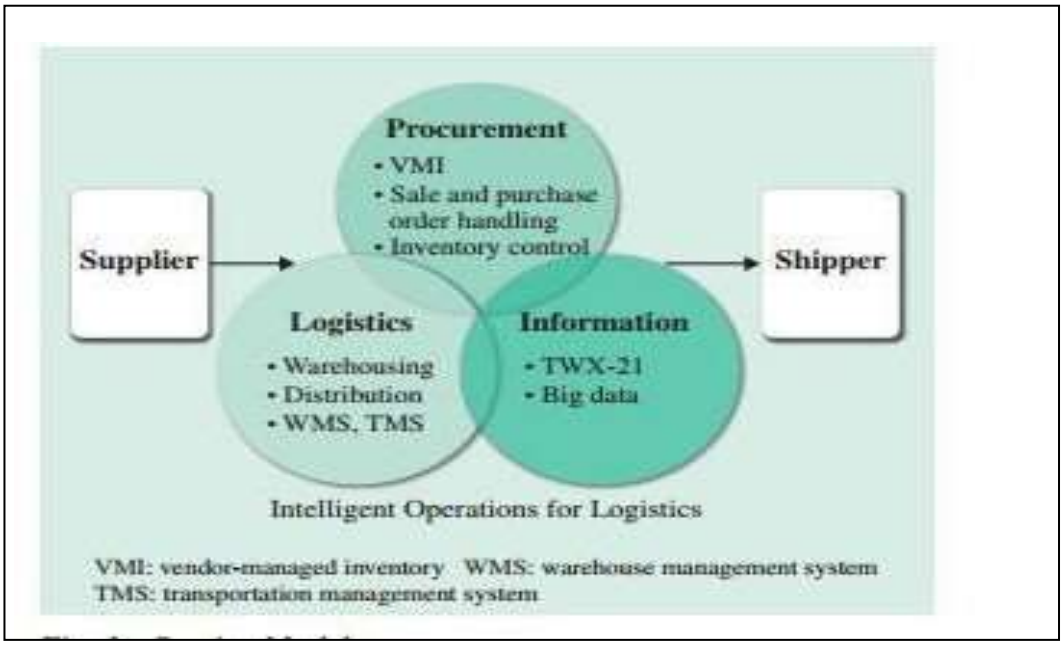


Figure 2: Current and planned investment areas for Big Data technologies. **Source:** "Trends and Strategies in Logistics and Supply Chain Management", p. 51, BVL International, 2013



The potential for Big Data in logistics industry has been highlighted in logistics service providers.

Big data in logistics reveals with what is happening now with data and what is likely to happen in future. It presents an exciting and important role for consolidating the traditionally fragmented logistics industry.

Data's which are generating through

- EDI
- RFID
- voice-activated systems
- Transportation management software (TMS),
- Free freight management software for LTL,
- Warehouse management software (WMS),
- Manufacturing resource planning (MRP) software,

- Bar code reading
- Cloud-based parcel management software, and more.

Big data application that will execute effective route optimization and route planning and scheduling with less environment impact and better customer service.

Supply chain companies can make deliveries keeping fuel consumption, mileage, engine condition, emission, driver's behaviour, speeding habit, shortest route planning, deprecation and other opportunities and avenues to cut-down cost.

Big Data analytics falls into one of three dimensions:

The first and most obvious is operational efficiency In this case, data is used to make better decisions, to optimize resource consumption, and to improve process quality and performance. It's what automated data processing has always provided, but with an enhanced set of capabilities.

The second dimension is customer experience; typical aims are to increase customer loyalty, perform precise customer segmentation, and optimize customer service.

Including the vast data resources of the public Internet, Big Data propels CRM techniques to the next evolutionary stage. It also enables new business models to complement revenue streams from existing products, and to create additional revenue from entirely new (data) products.

The primary objective of a supply chain is to extract useful information by analysing the humorous number of data being generated from all the objects and tools across the logistics function.

However, the challenge lies in aggregating such huge diverse set of data generated from multiple sources and thereby providing on time information to asses present situation and predict the future.

A supply chain is referred to as an integrated system which synchronizes a series of inter-related business process. The enterprises in logistics seek for the benefit of the whole system to maintain the stabilization and development of system, as well as seek for maximum of the profit of their own.

There are a flow of goods, manufacturing goods, merchandise and manufactured goods, and a flow of information, which made up of data between enterprise, and a flow of money going with the logistics.

As a 3PL, we value the data that drives business and customer relationships. The data warehouse, and business intelligence that it offers, provides the ability to answer questions (and even think up new questions) by turning the massive amount of data from operational systems into visible, actionable, and easy to understand information.

Logistics providers must be poised and ready to analyze current and long-term trends as well as alerting clients to opportunities and problems. The value of having information 'at your fingertips' gives continuous feedback on the effectiveness of decisions, processes, and ultimately, the health of your business.

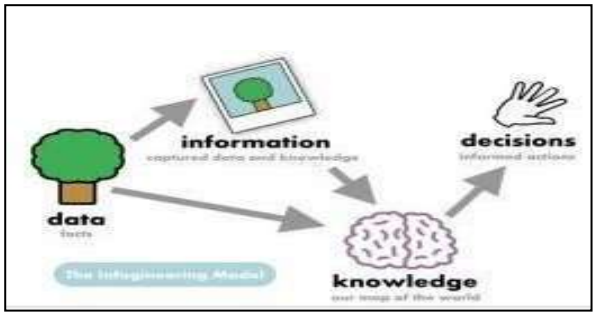
Benefits of data warehouse for logistics providers include:

Access data from multiple sources Business intelligence

Enhanced query ability/data mining Timely access to data

Improved data quality and consistency in reporting

Data warehouses are centralized data repositories that integrate data from various systems, applications, and sources. The data warehouse is an environment separate from the operational systems, and it is completely designed to provide for analytical and ad-hoc reporting, queries, and data analysis. Because the data warehouse is in an isolated environment, queries, data mining, and analysis can be performed without any impact on the operational systems.[8]



CONCLUSION

Big data is big news. In 2013, 64 percent of respondents to a Gartner survey of 720 companies worldwide were investing or planning to invest in big data technologies.

While it is generating interest, the concept of big data also creates a fair amount of confusion. For all their desire to mine insight from the mass of information their companies collect, many corporate leaders are puzzled about how to put big data to work. Among the respondents to the Gartner survey, 56 percent say determining how to get value from big data is a major challenge, and 41 percent cite challenges with defining their big data strategies.

Looking ahead, there are admittedly numerous obstacles to overcome (data quality, privacy, and technical feasibility, to name just a few) before Big Data has pervasive influence in the logistics industry. But in the long run, these obstacles are of secondary importance because, first and foremost, Big Data is driven by entrepreneurial spirit. Several organizations have led the way for us – Google, Amazon, Facebook, and eBay, for example, have already succeeded in turning extensive information into business. Now we are beginning to see first movers in the logistics sector. These are the entrepreneurial logistics providers that refuse to be left behind; the opportunity-oriented organizations prepared to exploit data assets in pursuit of the applications described in this trend report. But apart from the leading logistics providers that implement specific Big Data opportunities, how will the entire logistics sector transform into a data-driven industry? What evolution can we anticipate in a world where virtually every single shipped item is connected to the Internet? We may not know all of the answers right now.

But this trend report has shown there is plenty of headroom for valuable Big Data innovation. Joining resources, labour, and capital, it is clear that information has become the fourth production factor and essential to competitive differentiation. It is time to tap the potential of Big Data to improve operational efficiency and customer experience, and create useful new business models. It is time for a shift of mindset, a clear strategy and application of the right drilling techniques.

Over the next decade, as data assumes its rightful place as a key driver in the logistics sector, every activity within DHL is bound to get smarter, faster, and more efficient.

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