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4th year CSE-D

Data Analytics Assignment -1

BIG DATA – APPLICATIONS

Big Data Applications are transforming a large number of industries in the modern world. From healthcare to finance, from marketing to manufacturing, Big Data – identified by its 4 Vs – has emerged as a game-changer, empowering businesses with valuable insights and data-driven decision-making. In this blog, we will provide an overview of the top 12 Big Data Applications, accompanied by real-world examples to illustrate their practical implementation.
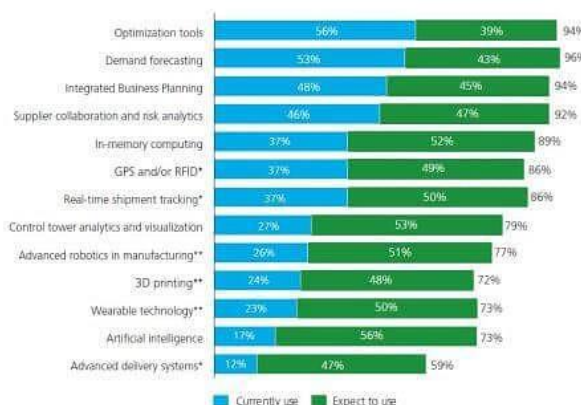

1. Manufacturing and Natural Resources

In the natural resources industry, Big Data allows for predictive modeling to support decision making that has been utilized for ingesting and integrating large amounts of data from geospatial data, graphical data, text, and temporal data. Areas of interest where this has been used include; seismic interpretation and reservoir characterization.

In the graphic below, a study by Deloitte shows the use of supply chain capabilities from Big Data currently in use and their expected use in the future.

Figure 2: Use of supply chain capabilities

	Currently use	Expect to use	Total
Optimization tools	56%	39%	94%
Demand forecasting	53%	43%	96%
Integrated Business Planning	48%	45%	94%
Supplier collaboration and risk analytics	46%	47%	92%
In-memory computing	37%	52%	89%
GPS and/or RFID*	37%	49%	86%
Real-time shipment tracking*	37%	50%	86%
Control tower analytics and visualization	27%	53%	79%
Advanced robotics in manufacturing**	26%	51%	77%
3D printing**	24%	48%	72%
Wearable technology**	23%	50%	73%
Artificial intelligence	17%	56%	73%
Advanced delivery systems*	12%	47%	59%

Notes:
Chart is ordered by the percentages for "Currently use".
*Manufacturing and retail respondents only.
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2. Healthcare Providers

Industry-specific Big Data Challenges

The healthcare sector has access to huge amounts of data but has been plagued by failures in utilizing the data to curb the cost of rising healthcare and by inefficient systems that stifle faster and better healthcare benefits across the board.

This is mainly because electronic data is unavailable, inadequate, or unusable. Additionally, the healthcare databases that hold health-related information have made it difficult to link data that can show patterns useful in the medical field.
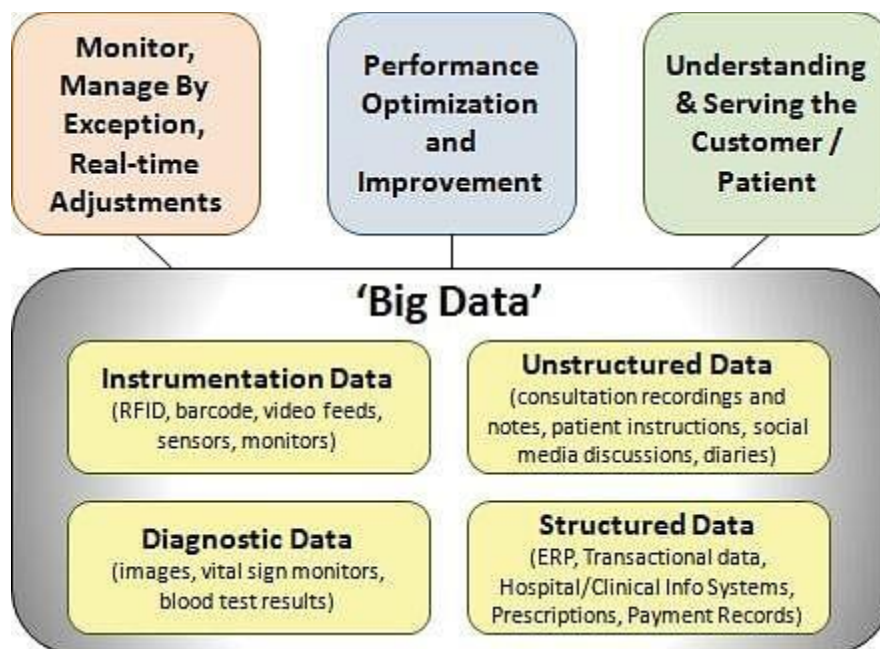
3.Transportation Industry

Some applications of Big Data by governments, private organizations, and individuals include:

- Governments use of Big Data: traffic control, route planning, intelligent transport systems, congestion management (by predicting traffic conditions)

- Private-sector use of Big Data in transport: revenue management, technological enhancements, logistics and for competitive advantage (by consolidating shipments and optimizing freight movement)

- Individual use of Big Data includes route planning to save on fuel and time, for travel arrangements in tourism, etc.

Examples of where Government and the Private Sector is using Big Data

Mode	Name	Project Type	Year	Value	Technology/ Consulting Partner
Road	**City of Dublin**	Congestion & Traffic Management	2010	€66 million	IBM
Road	**City of Stockholm**	Traffic Patterns & Congestion	2006-2011	€218 million	IBM
Road/ Maritime	**City of Da Nang, Vietnam**	Congestion & Traffic Management	2013- ongoing	Smart Cities Challenge worth €37 million	IBM
Air	**Lufthansa**	Revenue Management	2013		SAP/HANA
Air	**Air France-KLM**	Revenue Management			
Air	**Swiss International Airlines**	Revenue Management			
Air	**Frontier Airlines**	Revenue Management			
Air	**British Airways**	Competitive Advantage	2012	"Significant amount" of €7b investment in new products, technology, etc.	Opera Solutions
Road	**Munich Airport**	Competitive Advantage & Tech Enhancement	2013		Lufthansa & Amadeus

- www.asbabyy.com "At the Big Data Crossroads: turning towards a smarter travel experience", viewed 22 Aug 2013.
- https://www.termequidahub.com/blog/travel-and-transportation-age-big-data, viewed 22 Aug 2013

4. Big Data in sports analytics

Big Data has revolutionised the world of sports analytics, empowering coaches, teams, and players with valuable insights to improve performance and gain a competitive edge. By harnessing vast amounts of data on player statistics, game performance, and opponent analysis, sports teams can make data-driven decisions to enhance training, strategy, and player development.

One of the primary applications of Big Data in sports analytics is player performance analysis. By collecting data on player movements, speed, and physiological metrics during games and training sessions, coaches can identify strengths and weaknesses in individual players. This data-driven approach allows coaches to tailor training programs to address specific areas of improvement and maximise each player's potential.

Big Data Applications also enable in-game decision-making for coaches and players. Real-time data on opponent tactics, player fatigue, and game situations can be analysed to inform strategy adjustments and substitutions. This data-driven approach enhances teams' adaptability and improves their chances of success during high-pressure moments in games.

5 . Big Data in social media

Big Data Applications have become the lifeblood of social media platforms, shaping how users interact and engage with content. By analysing vast amounts of user data, including preferences, behaviour, and interactions, social media platforms can deliver personalised content and advertisements that resonate with users.

One of the key advantages of Big Data Applications in social media is the ability to target advertisements effectively. By analysing user data, social media platforms can serve targeted ads based on their users' interests and demographic information. This level of personalisation leads to higher engagement and conversion rates for advertisers.

Moreover, Big Data analytics has played a pivotal role in content curation and recommendation algorithms. Social media platforms use data-driven algorithms to recommend a personalised level of content to users based on their previous interactions and preferences. This data-driven approach enhances user experience and encourages users to spend more time on the platform.

Applications of BIG DATA In
10 INDUSTRY VERTICALS

1 — BANKING AND SECURITIES
Challenges:
- Early warning for Securities fraud and Trade visibility.
- Card fraud detection and audit trails.
- Enterprise credit risk reporting.
- Customer data transformation and analytics.

The Securities Exchange Commission (SEC) is using big data to monitor financial market activity by using network analytics and natural language processors. This helps to catch illegal trading activity in the financial markets.

2 — COMMUNICATIONS, MEDIA & ENTERTAINMENT
Challenges:
- Collecting, analyzing and utilizing consumer insights.
- Leveraging mobile and social media content.
- Understanding patterns of real-time, media content usage.

Wimbledon Championships leverages big data to deliver detailed sentiment analysis on the tennis matches to TV, mobile and web users in real-time.

3 — HEALTHCARE PROVIDERS
Challenges:
- Rising Medical costs.
- Unavailability/inadequate/unusable Data.

Free public health data and Google Maps have been used by the University of Florida to create visual data that allows for faster identification and efficient analysis of healthcare information, used in tracking the spread of chronic disease.

4 — EDUCATION
Challenges:
- Incorporating data from varied sources.
- Untrained Staff and Institutions about Big Data
- Issues of privacy and data protection.

The University of Tasmania, Australia with over 26000 students has deployed a Learning and Management System that tracks, log time, time spent on different pages and the overall progress of a student over time.

5 — MANUFACTURING & NATURAL RESOURCES
Challenges:
- Increase in the volume, complexity and velocity of data due to rising demands of Natural resources.
- Large volumes of untapped data from the manufacturing industry.
- Underutilization of data prevents improved quality, energy efficiency, reliability and better profit margins.

Enhancement in Supply chain capabilities from big data being used to increase productivity

6 — GOVERNMENT
Challenges:
- Integration and
- Interoperability of big data.

The Food and Drug Administration (FDA) is using big data to detect and study patterns of food-related illnesses and diseases, allowing for faster response to treatments.

7 — INSURANCE
Challenges:
- Lack of personalized services, pricing, targeted services to new market segments.
- Underutilization of data gathered by loss adjusters.
- Hunger for better insight.

- Customer insights for transparent and simpler products.
- Predicting customer behavior through data derived from social media, GPS-enabled devices and CCTV footage.
- Claims management, predictive analytics from big data has been used to offer faster service