AN IN-DEPTH ANALYSIS OF THE BIG DATA ANALYTICS AND THE KEY DRIVERS/INFLUENCERS IMPACTING SUSTAINABLE DEVELOPMENT IN GLOBAL BUSINESS

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ABSTRACT

The utilization of big data analytics significantly impacts international business practices concerning sustainable development. Leveraging extensive and diverse datasets empowers businesses to glean crucial insights into customer behavior, market trends, and operational efficacy. This enables informed decision-making that not only enhances profitability but also advances long-term sustainability objectives. With big data analytics, businesses can optimize resource allocation, minimize waste, and innovate solutions to complex environmental and social challenges. Moreover, it facilitates proactive strategies that foster economic growth while mitigating adverse impacts on the environment and society, fostering a more sustainable and responsible corporate ecosystem. This proactive approach aids in identifying both opportunities and threats within the ever-evolving global landscape.

INTRODUCTION

In this era of rapid technological advancement and an ever-expanding digital landscape, the influence of big data analytics in international business has become increasingly profound. This data-driven approach holds sway over sustainable development on a global scale, transcending the traditional confines of corporate boardrooms. As companies worldwide grapple with the complexities of a swiftly changing economic, environmental, and social landscape, the strategic application of big data analytics emerges as a pivotal determinant of business evolution and sustainability prospects. This introduction lays the groundwork for a deeper exploration of how big data analytics reshapes international business practices to foster sustainable development, marking the dawn of a promising yet responsible era for organizations across diverse industries.

Rob Kitchin's 2014 work underscores the seismic shifts in data generation, management, analysis, storage, and utilization, propelled by the data revolution spurred by groundbreaking information and communication technology advancements. This encompasses the emergence of "big data," denoting vast volumes of digital data readily shared across ICT networks, data digitization, the amplification of existing datasets, the open data movement, and the establishment of new institutional frameworks. Kitchin posits that transformative technologies will steer the corporate landscape towards analyzing various data types to enhance business efficacy in the international market. "Big data" denotes vast and intricate datasets which defy effective management and analysis through traditional data techniques due to their magnitude and complexity.

In this age, big data analytics plays a pivotal role in global business, encompassing various data types such as unstructured data (e.g., text documents, social media posts, photos, and videos), semi-structured data (e.g., XML files), and structured data (e.g., databases). Hariri, Fredericks, and Bowers (2019) highlight the increasing relevance of big data analytics due to the demand for deeper insights into patterns within vast datasets. However, data obtained from sensors, social media, and the Internet of Things often suffer from intrinsic unreliability stemming from noise, incompleteness, and inconsistency. To effectively assess and predict future activities, advanced analytical approaches are necessary. Artificial intelligence-based methodologies in big data analytics yield more accurate, faster, and scalable results. While previous studies have focused on specific methods or application domains, limited attention has been given to uncertainty in big data analytics.

The "Three Vs" encapsulate the fundamental characteristics of big data:

- Volume: Big data involves massive amounts of data, ranging from terabytes to petabytes or more, sourced from sensors, social media, transactions, and other records.

- Velocity: Data creation occurs at an astonishing pace, exemplified by Internet of Things devices and social media platforms generating millions of interactions per minute.

- Variety: Big data comprises diverse forms of information, including text, images, videos, and structured data from traditional databases, as well as unstructured data from various media sources.

In addition to the Three Vs, two other aspects are considered:

- Variability: Data may exhibit temporal shifts, posing challenges to analysis and interpretation.

- Veracity: The trustworthiness and accuracy of data influence the quality of conclusions drawn from big data, potentially diminished by noise, inadequacy, or untrustworthiness.

A. BIG DATA'S IMPACT ON GLOBAL BUSINESS

Big data significantly impacts global businesses by enhancing decision-making, operational effectiveness, and competitiveness. Multinational firms benefit from big data in several key ways:

- Informed Decision-Making: Big data analytics enables evidence-based decisions, informed by factual data rather than instinct or historical patterns.

- Market Analysis and Customer Insights: Analysis of vast datasets provides deeper insights into customer behavior, preferences, and spending habits, facilitating targeted marketing strategies and product/service adjustments.

- Operational Efficiency: Data analysis drives improvements in industrial processes, inventory management, and supply chain operations.

- Risk Management: Big data aids in analyzing and mitigating operational, financial, and cybersecurity risks.

- Competitive Advantage: Effective use of big data provides an edge in the fiercely competitive global business landscape.

- Personalized Customer Experiences: Analysis of consumer data enhances understanding of individual preferences, fostering customer satisfaction and loyalty.

- Global Expansion: Big data analytics offers insights into new markets, regulatory requirements, and cultural nuances, aiding in strategic planning for profitable foreign expansions.

- Cost Reduction: Operational efficiency improvements and preventative maintenance driven by big data lead to cost savings, such as reduced maintenance costs, energy consumption, and equipment downtime.

OBJECTIVES OF THE STUDY

1. Explore the projected diversification of job roles within big data analytics.

2. Determine the annual compensation packages allocated to employees across different analytics domains.

3. Investigate the impact of big data analytics on employment opportunities across diverse industries.

4. Understand the potential contribution of big data analytics to various industrial sectors' sustainability.

METHODOLOGY

This study employs exploratory research methodologies to assess the influence of big data analytics on the long-term viability of globally operating businesses. The researcher analysed secondary data including industry-specific employment trends, annual salary trends, sub-domain prospects within the big data sector, and the sector's contribution to various industries. The study seeks to ascertain the percentage growth rate of jobs, categorized by industry, as well as employment prospects within international trade, providing a comprehensive view of the field.

RESULT AND DISCUSSIONS

TABLE I: SHOWS THE EMPLOYMENT, PROJECTED ANNUAL SALARY AND EXPECTED GROWTH RATE FOR 2031.

Job	Total Employment	Mean Annual Salary (in Rs.)	Expected Percentage of Growth
Data Scientist	113300	22,50,000	36
Statistician	34200	7,43,478	33
Logistician	195000	16,85,217	28
Operation Research analyst	104200	18,63,478	23
Actuaries	28300	24,78,0434	21
Market Research Analyst	792500	14,83,260	19
Database Architect	52700	29,31,956	10

Salary Projection for 2031 Based on 2021

The table above illustrates the employment status, anticipated annual salaries, and growth for the year 2031, extrapolated from the foundational data of 2021. Among the seven job profiles examined, data analyst positions in the Market Research domain emerge as the most abundant. This segment stands out as one of the foremost sectors in global business, thus projecting the creation of a significant number of research analytics roles worldwide. Following closely, the logistics segment takes the second spot, indicating approximately 195,000 employment opportunities for data scientists. This profession exhibits a strong focus on global operations and analytics.

Table II: The table shows the projected percentagegrowth of employment in data analytics domain.

Analytics domain	Expected Percentage of Growth
Data Scientist	36%
Statistician	33%
Logistician	28%
Operation Research analyst	23%
Actuaries	21%
Market Research Analyst	19%
Database Architect	10%

Logistics and supply chain management play a crucial role in integrating international business within the competitive market. In the realm of data analytics, it stands as the third-largest field in terms of employment opportunities, with an estimated total of 113,300 positions. However, projections for employment opportunities in actuarial data science are considerably lower. Despite this, actuaries' data scientists command an impressive annual package, estimated to be around 2.5 crores per annum.

The growth rate for 2031, based on 2021 data, varies across different job titles in the analytics field. The general data scientist domain is projected to experience a 36% increase in the global market, indicating the highest employment opportunities in big data domains. Following closely, the statistician role is expected to see a 33% increase, securing the second position. The third domain, with a projected 28% increase in employment opportunities, pertains to logisticiansdomain, the operation research analyst position willbe projected 23%, the actuaries' projected rate is justless than 2% to research analyst and leastemployment projected in data base architect domains.Based on the above analysis, in future the highestemployment opportunities for general data scientist and statistician.

Table III: Sector wise Job Openings in Big Data

Sector	Proportion of Data based Job openings (out of 100)
Finance & Insurance	19
Professional Services	18
Information Services	17
Management	13
Manufacturing	12
Utilities	10
Wholesale Trade	9
Mining and Extraction	9
Public Administration	7

The data from the table indicates that the finance and insurance sector has the highest job openings in big data at 19%, followed by professional services at 18%, information services at 17%, management at 13%, manufacturing at 12%, utilities at 10%, wholesale trade at 9%, mining and extraction at 9%, and finally, public administration with the lowest percentage of job openings at 7%.

Table IV: Industry Wise Market Share of Big Data

Sector	Market share
Government	8.4
Manufacturing	9.2
Services	13.5
Telecommunication	10.2
Retail & wholesale	4.1
Banking	18.4
Health care	16.2
Sports	8.2
Utilities	2.8
Transportation	3.2
Education	6.8

The table above presents market share data for the big data industry across various sectors. The government sector holds a market share of 8.4%, followed by manufacturing at 9.2%. Services hold 13.5%, while telecommunications have 10.2%. Retail and wholesale combine for 4.1%, with banking leading the pack at 18.4%. Healthcare follows closely with 16.2%, while sports account for 8.2%. Utilities have 2.8%, transportation 3.2%, and education sector holds 6.8% of the market share.

CONCLUSION

Big data analytics enables organizations to leverage their data to identify new business opportunities in the global market, leading to faster business growth, efficient operations, increased return on investment, and improved customer satisfaction. Utilizing big data analytics for business operations can enhance efficiency and profitability, necessitating the hiring of skilled data analysts to sustain competitiveness in the global market. This research endeavors to forecast future employment opportunities in various domains of big data analytics for the year 2031. According to the research findings, actuaries and data scientists can expect the highest annual packages among various data analytics domains, with increased employment opportunities in market research and logistics sectors. In the realm of global business operations, the role of data analytics is indispensable, and their contribution to global business sustainability is paramount.

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