International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 08 | August - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

A Study on Evolution of Business Analytics & its Future Prospects

Kanika Chaudhry, Asst. Professor, Maharaja Surajmal Institute, New Delhi
Dr. Dimpy Sachar, Asst. Professor, Maharaja Surajmal Institute, New Delhi
Prabal Sharma, Student, Maharaja Surajmal Institute, New Delhi

Abstract

This research design investigates the elaboration and future of business analytics in India. Over the times, the subject of business analytics has seen substantial expansion and metamorphosis, owing to technological advancements, bettered data vacuity, and the growing applicability of data- driven decision- making in businesses. The purpose of this exploration is to give an overview of the literal elaboration of business analytics in India, to assess the current state of the assiduity, and to estimate its unborn trends and implicit influence on Indian enterprises. To gather perceptivity on the elaboration and unborn possibilities of business analytics in India, the exploration will employ a combination of qualitative and quantitative methodologies, similar as literature reviews, case studies, interviews with assiduity experts, and data analysis.

Keywords: Business Analytics, Descriptive Analytics, Predictive Analytics, Prescriptive analytics

I Introduction

Businesses won't be suitable to survive in a request where the competition uses a variety of logical tools and styles to promote optimal performance without good data use and committed analytics staff, commercial analytics has evolved into an important element of performance operation and commercial operations and indeed without the advanced tools and approaches accessible at the moment, the conception of business analytics and Smart business people used to do exploration like as client satisfaction checks and client feedback to identify what urged consumers to buy and use products on a regular base.

All of this needed mortal labor and took time. When complicated business analytics technologies were gradationally integrated into our culture, this was radically altered. latterly generations of business judges followed these and irrevocably altered the analysis world. Business analytics, well- known for its individual, prophetic, and conventional capabilities, has gained enormous traction in the recent time as governments and

healthcare institutions embraced this forward- allowing approach to prostrating organizational challenges and furnishing long- term results. Business analytics is now a buzzword for businesses each around the world.

Every association, anyhow of size, is looking for new ways to make sense of the massive quantum of raw data available. This is due to the fact that business analytics has been revolutionizing the way businesses operate for over a decade. From targeting the right guests and perfecting deals to aiding HR labor force in opting the right aspirants and lowering outflow charges, data analytics has touched nearly every assiduity.

i) Objectives of the Study

This exploration will explore the history of business analytics, dissect its current position in India, and read its unborn growth and impact on the Indian commercial scene. To gain applicable information and induce meaningful findings, the exploration will use a combination of literature review and data analysis which is used by fascinating enterprise in their own right, it's felt that the more intriguing angle lies in the miracle as a whole.

This study examines business analytics from the 1990s to 2020s and addresses the unborn compass from 2020 to 2030s using discovered specimens and motifs from exploration as the foundation for the context on unknown development. By doing so, the research seeks motifs that ideally explain all the driving forces for business logical transformation, but also aid in forecasting what should be expected.

This research paper revolves around the following objectives:

1) To dissect a progressive and descriptive view of analytics.

2) To understand the evolution of business analytics using case studies.

3) To analyze the trends in the business analytics till date.

ii) Scope of the Study

While business analytics is growing more important and constantly employed by enterprises across all diligence, the conception remains a delicate vision for numerous. The subject of business analytics is veritably general and fractured, leaving directors complexed and eventually unfit to make sound opinions. This study gives an evolutionary depiction of business analytics, giving a distinct overview that indicates where the marvels began, where it now sits, and where it's headed.

The paper establishes concluding trends through cross-case analysis, which served as the frame for the discussion of unborn developments in business analytics. Grounded on our findings, the exploration contends that business process robotization will most probably continue to grow.

AI is advancing in a variety of fields, each specializing in a complicated task traditionally reserved for humans. still, trends indicate that new jobs related to artificial intelligence will nearly clearly be developed.

On the negative, associations, people, and technologies are anticipated to come more connected than ever ahead. This study spans the elaboration of business analytics from 1950 through 2022. It covers crucial events, changes, and trends that shaped the field during this time period. The exploration focuses on significant improvements in data warehousing, business intelligence, prophetic analytics, big data, data visualization, advanced analytics approaches, pall computing, real- time analytics, ethical issues, IoT analytics, and the Internet of effects, and the integration of arising technologies.

The study provides a general overview of the elaboration of business analytics, including major events and advancements. It isn't a total analysis of every single development in the field but aims to give a comprehensive understanding of the crucial metamorphoses and trends that have told business analytics during the specified timeframe.

iii) Business Analytics- An overview

According to the check results, enterprises are decreasingly seeing BA as a vital part in diving their hurdles, anticipating unborn results, and staking on important data. It was also discovered that associations generally use three types of analytics descriptive analytics(which use data mining and business intelligence to produce trending data grounded on former or current events), prophetic analytics(which use different models and methodology to prognosticate unborn results grounded on history and present information), and conventional analytics(which allows directors to look ahead and explore the future of their critical systems) to gain maximum advantage instantly. The detailed explanation of all the points included in the conducted check are explained below:

a) **The Prerequisite of Business Analytics**

It's a grueling task to have an idea about where to find the most pivotal data and how to restrain meaningful conclusions from the acquired set of data, since numerous moving corridors go into the analytics. For newcomers, BA is the tool an association requires to take functional opinions that are most likely to affect the absolute business by enhancing the deals, operations and profitability.

b) **How is IT application changing by using business analytics?**

Business Analytics has introduced interesting approaches into the Information Technology sector, like as data mining, statistical analysis, and prophetic analysis, which are concerned with the metamorphosis of data into useful information. IT professionals use logical systems and software tools to make data- driven opinions that ameliorate business issues. operations Of Business Analytics Along with the arising technology and determined small business scripts companies look forward to a simple system to put their attention and attention in growing their company's profit meanwhile reducing their functional charges. Following are many most significant operations of analytics:

1. M**anaging client Relationship:** Client experience and service are the foundations of client relationship operation. When a company can directly watch and dissect customer service factors and client satisfaction, it becomes much easier to make applicable advancements and insure client retention. To maintain their client relations efficiently and effectively, the business must prioritize serving their significant and necessary guests, learning the buying nature and consumer guardedness for different position sections, customer biographies, services, and particulars.

2. **Market Exploration:** The data which is grounded on the performance is employed in the request handbasket analysis to perceive commercial regulations. This has been greatly useful in admitting purchase structure of consumers having mass application. Looking into similar orders of consumers have backed associations to read their forthcoming purchasing patterns.

3. **Inventory Control:** Inventory operation is critical for any establishment with a force chain. Indeed, if earnings are attained, inadequacy in force operation can scrap income. To maximize profit and increase client happiness, force must be kept in a regular manner. Any inefficiency in force operation might lead to increased charges and a loss in returns. Business intelligence results may successfully help enterprises in checking and noting their force situations; also, BI makes force optimization selections easier.

4. **Banking Technology:** Banking technology is constantly reshaping the finance and banking sector due to the Internet and the growth in number of mobile bias and apps. The current profitable associations have been looked out on thrusting competition, growth in demands by customer, and the necessity for threat operation and strict control in an extremely advancing request. Prior to loan allotment, banks determine the lender's capability to remunerate the loan. Business analytics helps in assessing the old data and anticipate unborn value of client's asset.

To make indeed more sense, reports are generated grounded on intelligent data, which are so sophisticated that they can handle everything from data collecting to report product. These reports are needed to make unborn vaticinations, develop company strategy grounded on solid data, and control pitfalls and future losses.

d) Descriptive Analysis

This accounts for the primary step in the analytics process, descriptive analysis aptly tells us about the happenings of the past and how does it affect the present. This allows you to examine your business situation critically in ways similar to techniques used for understanding and evaluating data and information. This stage informs you about your company's working prowess and helps you to design plans to ameliorate your business problems with much more accuracy and grounded perceptivity.

e) Predictive Analytics

The second stage towards the process of business analytics is the predictive analytics phase which takes into consideration the "what" that needs to be done in accordance to a specific business problem. This stage takes into consideration the science to devise methods to analyze and interpret data to provide an appropriate answer to a specific business problem and provide further insights to ensure that the results provided a defined view of the problem at hand.

f) Diagnostic Analysis

After descriptive analysis of the data, the next step is to understand the root of the problem or simply the 'why'. Diagnostic analytics gives you a brief and more speculative understanding of the data and the previous research findings to work with more precision.

By providing possibilities and prospects, diagnostic analysis analyses and points out the reason of a certain happening and the root cause to better understand the solution, the various techniques used in diagnostic analysis is data mining, data discovery, and correlations.

g) Prescriptive Analytics

Prescriptive analytics is the most advanced stage of business analytics, going beyond descriptive and predictive analytics. It focuses on providing actionable insights and recommendations to optimize decision-making and drive better business outcomes. Prescriptive analytics leverages historical data, real-time data, and predictive models to suggest various actions and the potential outcomes associated with each action.

The main objective of prescriptive analytics is to answer the question, "What should we do?" by identifying the best course of action based on available data, business goals, constraints, and preferences. It helps organizations make more informed and strategic decisions, enabling them to take advantage of opportunities and mitigate risks effectively.

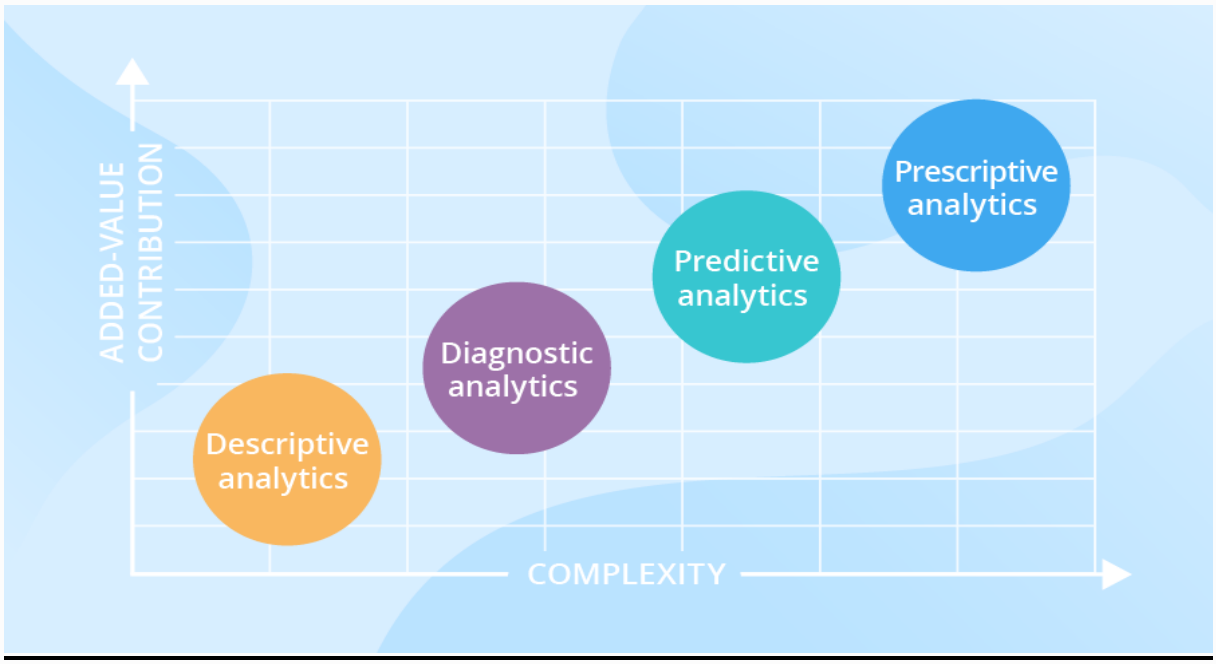


Fig 1: The graph shows the complexity and the working prowess of each of the types of Business Analytics techniques

II Evolution of Business Analytics

From 2000 to 2022, the discipline of business analytics has evolved dramatically, owing to technological improvements, the availability of large data, and the growing need for data-driven decision-making. Here are some significant milestones and trends that have affected the evolution of business analytics over this time:

Data Warehousing's Emergence: As corporations began to amass significant amounts of data in the early 2000s, data warehousing became more common. Businesses used data warehouses to combine and store data from diverse sources, allowing for more effective analysis and reporting.

Rise of Business Intelligence (BI): During this time, business intelligence tools gained prominence, allowing firms to extract insights from their data and create visualizations and reports. Self-service capabilities in BI solutions enabled corporate users to explore and analyze data on their own.

Growth of Predictive Analytics: Predictive analytics gained prominence as businesses sought to leverage historical data to make future predictions. Techniques such as regression analysis, data mining, and machine learning were used to forecast trends, identify patterns, and make informed decisions.

Big Data Revolution: The expansion of digital technology resulted in an explosion of data, often known as big data. This information was distinguished by its volume, diversity, and pace. Companies saw the potential utility of big data and began to implement tools and techniques for processing, storing, and analyzing enormous datasets

Introduction of Data Visualization: The visualization of data became increasingly important as organizations sought to communicate complex information in a more understandable and actionable format. Interactive dashboards and visual analytics tools emerged, making it easier for users to explore data visually and gain insights.

Integration of Cloud Computing: The advent of cloud computing provided enterprises with scalable and adaptable infrastructure for data storage and processing. Cloud-based analytics systems enabled enterprises to more effectively harness computational capacity, gain access to advanced analytics capabilities, and collaborate on data-driven initiatives.

Focus on Real-time Analytics: Businesses began to pivot toward real-time analytics as data creation accelerated. Streaming data processing frameworks and technologies such as Apache Kafka and Apache Spark allowed enterprises to evaluate data as it was created, allowing for quick decision-making.

Ethical Considerations: As analytics became more pervasive, ethical concerns around data privacy, security, and bias gained prominence. Organizations began to prioritize ethical considerations in analytics practices, focusing on responsible data handling, transparency, and fairness.

Augmented Analytics and AI-driven Insights Artificial Intelligence stand as the most advanced and outspoken technology of the future era that provides precise recommendations and insight production, which has grown in popularity in recent years. Non-technical people may now access analytics thanks to natural language processing and automatic machine learning.

Integration of Internet of Things (IoT) Analytics: The proliferation of IoT devices has generated massive amounts of sensor data. Organizations have increasingly focused on leveraging IoT analytics to gain insights from this data, enabling predictive maintenance, optimizing operations, and improving customer experiences.

Table 1: Key Timelines and Advancements

Year	Prevalent Concepts in Business Intelligence / Analytics
2000	The concept of Customer Relationship Management (CRM) gained traction as businesses recognized the importance of understanding customer behavior and preferences. CRM systems integrated data analysis to improve customer targeting, retention, and satisfaction.
2001	The Enron scandal brought attention to the need for improved financial analytics and risk management. It highlighted the importance of detecting anomalies, fraud, and irregularities through advanced analytics techniques.
2003	Tableau's introduction transformed data visualization by providing an easy and interactive platform. It enabled users to construct dynamic dashboards and visualizations without the need for considerable scripting or technical knowledge.

2009	As the demand for experts competent in statistical analysis, machine learning, and programming expanded, the phrase "data scientist" gained traction. Data scientists have become critical in extracting insights from large, heterogeneous databases.
2013	The Internet of Things (IoT) grew in popularity as gadgets and sensors became networked, producing massive volumes of data. IoT analytics arose to extract insights from this data, allowing businesses to streamline operations, increase product quality, and improve customer experiences.
2017	The rise of Automated Machine Learning (AutoML) gained momentum. The goal of AutoML tools was to automate different levels in the process of machine learning which includes data pre-processing, machine language engineering, and model nomination, democratizing advanced analytics, making it more accessible to non-experts.
2020	The COVID-19 pandemic accelerated the adoption of data-driven decision-making in various sectors. Analytics played a crucial role in areas such as healthcare resource allocation, supply chain management, remote work analytics, and pandemic modelling.
2021	As concerns about algorithmic bias and fairness grew, an emphasis was placed on minimizing bias in data analytics models. Organizations began to establish processes to assure equal outcomes, reduce bias in data collecting and pre-processing, and explain algorithmic conclusions. These dates and modifications give a more complete overview of the historical milestones and innovations that affected the progress of business analytics within the time period indicated. The discipline is quickly evolving as a result of technology advancements, more data availability, and the growing demand for enterprises to draw insights and value from their data.

III Review of Literature

The study encompasses some previously researched data on the evolution of business analytics with appropriate details of studies conducted according to specific years and place of origin. The research conducted shows the increasing prowess of business analytics over the years and the significant rise during two decades of advancement.

Davenport, T. H., & Harris, J. G. (2007). This study explores the concept of competing on analytics, emphasizing the strategic value of data-driven decision-making. It discusses how organizations can leverage analytics to gain a competitive edge and provides examples of companies that have successfully transformed their businesses using analytics.

Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). This influential research discusses the role and importance of business analytics in understanding data to gain actionable insights. It highlights the evolution of BI and analytics tools, techniques, and applications, emphasizing the transition from traditional data warehousing to big data analytics.

Marr, B. (2016). This study explores the use of big data analytics and metrics to drive better decision-making and improve business performance. It encompasses topics of discussion such as data-driven decision frameworks, data quality, predictive analytics, and the integration of analytics into organizational processes.

Figure 2 represents the distribution of the all the studies conducted from the year 2000 till 2019. There were just a few publications in 2000, 2001, and 2002, but this climbed to two in 2003, three in 2004, three in 2005, and two in 2006 and 2007. Similarly, 11 studies were conducted and the data observed between 2008 and 2010.

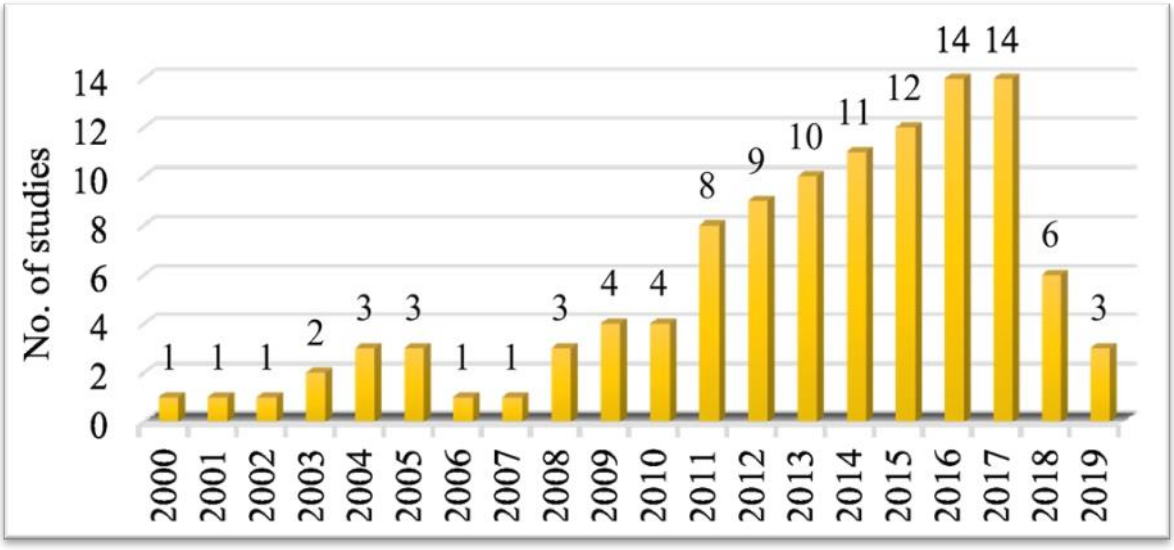


Fig 2. Researchers conducted from the year 2000 to 2019.

From the year 2011 to 2019, there was a rise in the number of studies conducted. During the earlier years, the research focused mainly on the study of Data Warehouses and the working of Online Analytic Processing Units (OLAP) and even both for their collective understanding with respect to business intelligence.

Various research approaches, including the qualitative and quantitative methods, were adopted for the purpose of understanding the business intelligence process. The distribution of research types, namely qualitative, quantitative and mixed methods (quantitative + qualitative), is presented in the following figure 3.

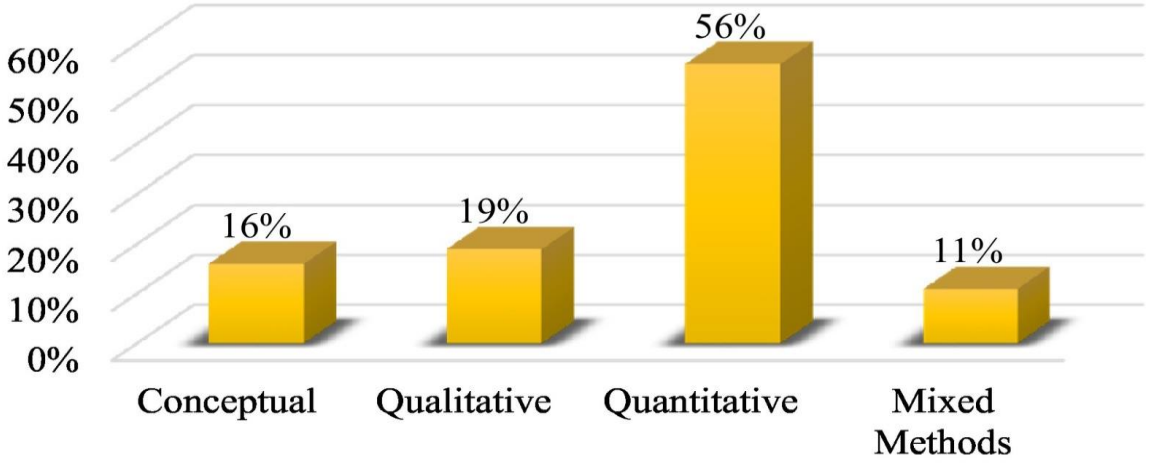


Fig 3: The various research methods for Business Analytics

In this research, the survey approach was often used. As indicated, data was collected through mail or web-based surveys, and the majority of respondents were managers, BI professionals, and executives who utilized BI systems. Figure 3 shows that 19% of respondents utilized a qualitative approach.

Table 2: Articles published Country –wise

Country	Article Count	Country	Article Count	Country	Article Count
United States	24	United Kingdom	2	Japan	1
Taiwan	17	India	2	Hong Kong	1
Australia	12	Peru	2	Lithuania	1
China	8	North America	2	Morocco	1
South Africa	7	Canada	2	Nigeria	1
Slovenia	6	Asia	2	Puerto Rico	1
Germany	5	Denmark	1	Scandinavia	1
France	3	Netherlands	1	Switzerland	1
Malaysia	3	Middle East	1	Austria	1
Europe	2	Ghana	1	Israel	1
Iran	2	Italy	1	Jordon	1
Peru	2	Korea	1	Brazil	1
Thailand	2	Bangladesh	1	Middle East	1

IV Case Studies to Identify Evolution and Prospects

i) Walmart's Data Warehousing

Walmart is a retail firm that first established its outlet in Arkansas, United States in 1962, with the purpose of being the greatest store in town while continuing to grow rapidly, Walmart became profitable and continued to expand its business, with the increasing sales the company needed to introduce the use of data warehousing techniques, Walmart invested in data warehousing, which enabled it to have access to vital information that quadrupled its business and overall sales.

Challenges Faced by The Company

Walmart's fast development made managing its many locations and meeting the demands of its diverse clients from various places increasingly challenging. Walmart discovered that what worked in one location did not work in another, and management began to lose control of its ability to rule. Furthermore, Walmart's management information systems could only provide aggregates and abstracts of the business's activities at the time, which was viewed as a deceptive picture of any single shop, at any moment, in any market.

Eliminating Obstacles Using Business Analysis

The management realized that their business choices needed to be adjusted to each shop in order to meet the needs of the clients that visited that location.

To address this problem, senior executives decided to utilize data warehousing. As a result, Walmart sought a partner with whom that would accomplish its goals, and Teradata Corporation was a perfect choice for the operation. Teradata initially constructed a data warehouse for Walmart in the mid-1990s, collecting shipping and transactional details via its point-of-sale systems, where customers pay for their goods that enabled them to assess and understand the volume and the strategy needed to boost sales and revenues.

ii) Netflix and its Big Data Archives

Netflix is a multinational video streaming agency based in the USA, it was founded in the year 1997, focusing originally in a DVD subscription service. After placing an order on its website, the firm would distribute DVDs and online streaming service of web series and TV shows to its users worldwide with prepaid return envelopes. Netflix began providing its members the option of streaming some of its digital content over the internet to its users starting from the year of 2007 and has significantly grown since then with a huge client base.

Company Challenge(s)

Prior to the introduction of its online streaming facility, the company was constrained by a lack of information about its members. Initially, the company only had access to four data pieces from their Digital Video distribution service: Customer Identification, Rental Date of the Movie, Movie Identification Details and the ratings of the rented movie. The corporation need additional information in order to make informed selections about which movies and television series would be of interest to its members. As a result, its content-library

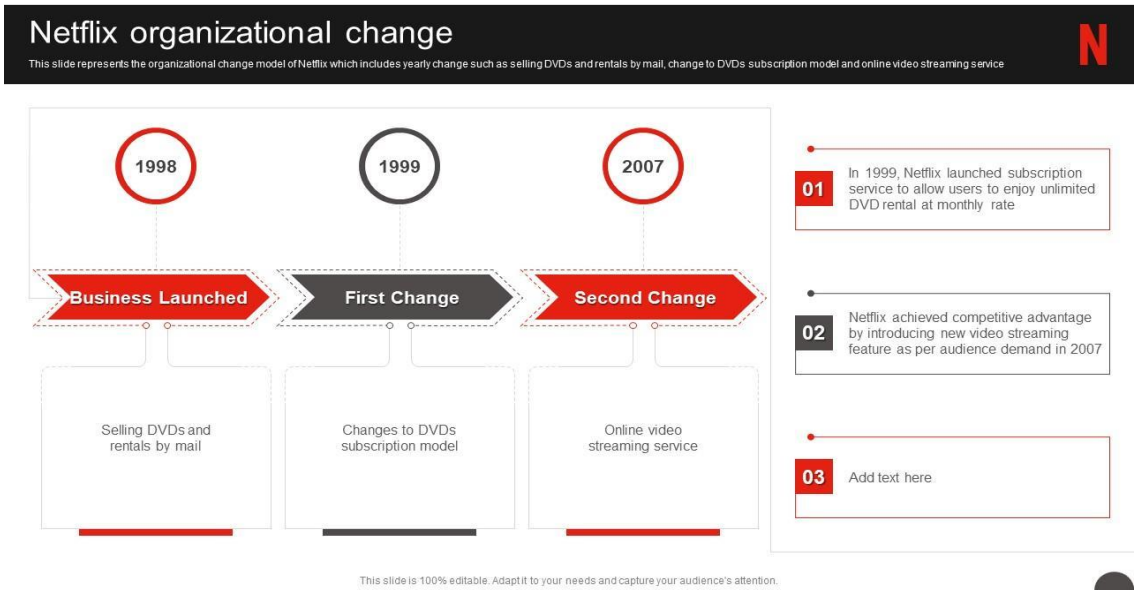
selection is improved. Netflix was the first to launch the streaming services at such a large scale and with such ease to its users that quickly rose to demand and affected its overall revenue and customer acquisition.

Netflix became the first streaming service to introduce video streaming with such ease and easy availability to its users and this was the reason was able to counter its rivals such as Hulu, Prime Video, Apple TV to become the first and the highest rated choice of the people for online streaming and quickly rose to prominence in the early 2008 , the result of this usage of big data archives led to the rise of profit levels of the company from $180 million in 2010 to a staggering $1.98 billion in 2012 and is considered as the most profitable streaming service in the recent times.

Eliminating Obstacles Using Business Analysis

Netflix started its online streaming service starting in the year 2007, a plethora of new data points about its members became available. The data encompasses the following client data. - Data from streaming (e.g., the duration of streaming, date and time of day streaming videos, type of equipment used, day of week consuming content, and which content) - Text data related to searches - Location information (that are accessible via IP addresses) Following that, the consumer's data was linked with the following information: - Metadata pertinent to a library title (such as director, actor, genre, rating, and reviews.

The strategic decision not only solved the task of releasing streaming licenses each time but it also greatly helped in producing watchlist that matched a viewer’s liking and so suggested the same and otherwise, thus enhancing the user experience. Netflix used big data techniques to analyze data from 29 million users, predicting material that would be of interest to viewers and producing unique series depending on demand.



V Conclusion

The rise of Business Intelligence and related fields have garnered substantial recognition by directors and policy makers in the recent period of specialized improvements and hyperactive- competition with their rich data driven decisions that help to supply intricate and competing data inputs for selecting an option.

According to studies, businesses have not yet understood the prowess and usefulness of Business Intelligence and Analytics and are looking for strategies to harness value from the installed systems. still, there has been no thorough study that analyzes the enterprises and obstacles associated with the relinquishment, the intricate processes and the desired results.

Over the course of a decade the idea and the prowess of Business Analytics has grown in elevation and piqued the interest of both academic and professional- marketable groups. It consists of colorful tools, strategies, and procedures aimed at assessing company data and rooting new patterns, trends, and/ or perceptivity that bring fresh marketable value. Dealing with crucial corridor of the BA conception, this study argues that the further advancements in this field are a brain child of intricate problems and the zeal to find their solutions with much detail as possible.

The paper aptly produces the result that only two specific type of analytics -bedded and service analytics account for the maximum pivots for the process of business analytics and its normalization. Although the crux of the paper is focused on the content of information and communication technology changes and their influence on business analytics, the composition also examined the larger business consequences of data and analytics perpetration.

Efficient and relevant systems are needed for the timely understanding and decision making on the processes that will be developed to increase the rate of understanding and analyzing a set data quantity in order to continue generating suitable data architectures. Some academics believe that associations will ultimately elect a further decentralized approach to dealing with the difficulties, similar as edge and fog computing. Throughout this time, firms have worked to obtain insights, improve consumer satisfaction levels and use the same to increase the level on which one organisation works to enable them to better understand and interpret a consumer mindset by leveraging data. Data visualization, predictive analytics, and machine learning have enabled organizations to derive useful insights from their data, allowing for more informed decision-making.

The use of cloud computing, the emphasis on real-time analytics, the rising relevance of ethical issues, and the incorporation of IoT analytics have all affected the growth of business analytics. These advancements have broadened the opportunities for data-driven innovation across a wide range of sectors and areas.

As the field progressed, there has been an increasing emphasis on data governance, compliance, and privacy regulations to ensure responsible and ethical use of data. Furthermore, the COVID-19 pandemic acted as a catalyst, accelerating the adoption of data-driven decision-making and highlighting the importance of analytics in crisis management and resilience.

References

Ain, N., Vaia, G., DeLone, W. H., & Waheed, M. (2019). Two decades of research on business intelligence system adoption, utilization and success–A systematic literature review. *Decision Support Systems*, *125*, 113113.

Affectiva. (2015, February 10). The Promise of Emotion-Enabled Augmented Reality (AR). Retrieved from Affectiva: https://www.blog.affectiva.com/the-promise-of-emotion-enabledaugmented-reality-ar/

Affectiva. (2019, April 11). Affectiva Raises $26 Million to Fast-Track Human Perception AI in Automative and Conversational Interfaces. Retrieved from Affectiva: https://www.affectiva.com/news-item/affectiva-raises-26-million-to-fast-track-humanperception-ai-in-automotive-and-conversational-interfaces/

Concluding evidence and report on further development and studies: https://www.researchgate.net/publication/334679496_Business_analytics_new_concepts_and_trends

Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS quarterly*, 1165-1188.

Davenport, T. (2014, March 03). Big Data at Work: Dispelling the Myths, Uncovering the Opportunities.

Davenport, T. H., & Harris, J. G. (2007). Competing on analytics: The new science of winning. Harvard Business Review, 85(1), 98-107.

Gorman, M.F. and R.K. Klimberg (2014). Benchmarking Academic Programs in Business Analytics. Interfaces. 44(3):329-341.

Ghosh, P. (2018). Business Intelligence and Analytics Trends in 2018. *Retrieved February*, *21*, 2018.

Harvard Business Review. Davenport, T. H., & Harris, J. G. (2007, March 6). Competing on Analytics: The New Science of Winning. Harvard Business School Press.

IBM. (2012). Analytics: The real-world use of big data: How innovative enterprises extract value from uncertain data.

Jaklič, J., Grublješič, T., & Popovič, A. (2018). The role of compatibility in predicting business intelligence and analytics use intentions. *International Journal of Information Management*, *43*, 305-318.

Jiang, Y. (2009, August). A conceptual framework and hypotheses for the adoption of e-business intelligence. In *2009 ISECS International Colloquium on Computing, Communication, Control, and Management* (Vol. 4, pp. 558-561). IEEE.

Kokin, S., & Wang, T. N. (2014). Business intelligence: relationship between capabilities, success and decision environment. *Applied Mechanics and Materials*, *513*, 4361-4365.

Kumar, T. V., & Purkayastha, D. (2013). Netflix: leveraging big data to predict entertainment hits. *IBS Center for Management Research*.

Kasula, C. (2020). Netflix recommender system–A big data case study. *Website: https://towardsdatascience. com/netflixrecommender-system-a-big-data-case-study-19cfa6d56ff5*.

Negi, A., & Student, P. G. (2021). Profundity Of Business Analytics & it's Purview In India. *IJRAR-International Journal of Research and Analytical Reviews (IJRAR)*, *8*(4), 13-17.

Press, G. (2016). Cleaning Big Data: Most Time-Consuming, Least Enjoyable Data Science Task, Survey Says, Forbes.com.

Peters, M. D., Wieder, B., Sutton, S. G., & Wakefield, J. (2016). Business intelligence systems use in performance measurement capabilities: Implications for enhanced competitive advantage. *International Journal of Accounting Information Systems*, *21*, 1-17.

Ramakrishnan, T., Jones, M. C., & Sidorova, A. (2012). Factors influencing business intelligence (BI) data collection strategies: An empirical investigation. *Decision support systems*, *52*(2), 486-496.

Ranyard, J.C., Fildes, R. and Hu, T.I., 2015. the influences of problem structuring methods and the analytics movement. European Journal of Operational Research, 245(1), pp.1-13.

Schlegel, K. (2011). Key Issues for Analytics, Business Intelligence and Performance Management. Stamford, CT: Gartner Research.

Soldić-Aleksić, J., Krasavac, B. C., & Karamata, E. (2020). Business analytics: new concepts and trends. *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, *25*(2), 15-29.

Sharafuddin, S. (2020). *The evolution of business analytics: based on case study research* (Master's thesis).

Trieu, V. H., Cockcroft, S., & Perdana, A. (2018, June). Decision-making performance in big data era: the role of actual business intelligence systems uses and affecting external constraints. In *Proceedings of the 26th European Conference on Information Systems (ECIS 2018)*. Association for Information Systems (AIS).

Watson, H. J. (2009). Tutorial: business intelligence–past, present, and future. Communications of the Association for Information Systems, 25(1), 39

Zellal, N., & Zaouia, A. (2015, November). An exploratory investigation of factors influencing data quality in data warehouse. In *2015 Third World Conference on Complex Systems (WCCS)* (pp. 1-6). IEEE.