Tech-Business Analytics in Tertiary Industry Sector

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ABSTRACT

Purpose: *Tech-business analytics play a crucial role in the tertiary industry sector by enabling data-driven decision-making and providing analytical insights to enhance customer experiences, improve operational performance, and drive corporate growth. This sector, which includes industries such as healthcare, finance, education, and professional services, benefits from tech-business analytics through the analysis of vast data sets like patient records, financial transactions, student performance, and customer interactions. By identifying patterns, trends, and insights within these data sets, businesses can make more informed decisions.*

Design/Methodology/Approach: *The tertiary industry sector employs an organized, iterative approach to tech-business analytics, which involves defining business issues, collecting and cleansing data, analysing this data, interpreting the results, and communicating these findings to stakeholders. Through this process, businesses are empowered to make informed decisions that support their growth and development.*

Findings/Result: *The report talks about how Tech Business Analytics in the Tertiary Industry Sector will have controlled the expansion itself from its evolution to this point.*

Originality/Value: *A description of how business analytics varies from tech business analytics in the tertiary industry sector. For technical purposes, there is also a generic architecture that examines 30 recently published Tech Business Analytics in Tertiary Industry sector research projects.*

Paper Type: *Exploratory Analysis.*

Keywords: Business Analytics (BA), ICCT underlying technologies, Tech-Business Analytics, TBA, Tertiary Industry, Data Science, Big Data Analytics, Research gap in Business Analytics, ABCD Listing, Tech-business Analytics, Service industry,

1. INTRODUCTION :

The tertiary industry sector, sometimes known as the service sector, is primarily responsible for the economic growth of many countries. It is made up of industries that provide services to both consumers and businesses, such as healthcare, banking, education, and professional services. Businesses in these industries are depending more and more on tech-business analytics to boost operational efficiency, enhance customer experiences, and promote economic growth. Tech-business analytics in the tertiary industrial sector uses statistical and machine learning approaches to analyse data that these businesses produce, including patient records, financial transactions, student performance, and customer interactions. Businesses can gain insights into patterns and trends using this data to help them make decisions. The tertiary industry sector, which is commonly referred to as the "service sector," is essential to modern economies around the globe. Many different businesses and endeavors fall under this category since they provide services rather than tangible goods. This sector is characterized by its focus on giving customers experiences, information, interactions, and intangible values. The importance of the tertiary industry sector cannot be overstated because it not only fosters economic

growth but also increases people's standards of living in both their communities and as individuals. The Tertiary Industry Sector's Primary Characteristics

(1) Intangibility: The tertiary sector, in contrast to the primary and secondary sectors, deals with intangible products and services like education, healthcare, entertainment, financial services, and consultancy. These services frequently rely on skill, wisdom, and experience.

(2) Interaction and Personalization: To accommodate varying tastes, the tertiary sector mainly relies on interpersonal interaction and customization. Customers' individual demands are frequently taken into account when providing services, creating individualized experiences that might increase customer loyalty.

(3) Inseparability: The production and consumption of services frequently occur simultaneously. An illustration would be the direct delivery of medical services to patients by a healthcare professional, which makes the production and consumption of the service inseparable in both time and place.

(4) Variability: Services' consistency and quality can vary since people play a human role in providing them. Customer happiness depends on maintaining constant service quality, which can be difficult.

(5) Perishability: A service cannot be saved for later use because it is a perishable good. Loss of revenue potential might be seen in unused appointment times or vacant seats on flights.

The tertiary industry is important in economy and society due to following reasons:

(1) Economic Growth: Economic expansion and job creation are significantly influenced by the tertiary sector. It contributes greatly to the GDP and employment prospects in many industrialized economies.

(2) Innovation and Technology: By consistently adjusting to shifting consumer expectations and new technological advancements, the industry fosters innovation. The use of technology to deliver services improves accessibility, convenience, and efficiency.

(3) Quality of Life: People's daily life are directly impacted by the services the tertiary sector offers. The entire well-being of individuals and communities is improved by having access to high-quality healthcare, education, entertainment, and financial services.

(4) Urbanization: The primary and secondary industries give way to the tertiary sector as economies grow. As more individuals move into cities in quest of better work opportunities and access to services, this movement frequently coincides with growing urbanization.

(5) Globalization: Compared to physical items, services are simpler to export across borders. As a result, services have become more globally accessible, allowing companies to access new markets and diversify their sources of income.

(6) Job Opportunities: The tertiary sector provides a wide variety of employment opportunities, from expert services like legal and financial consultancy to creative professions in the entertainment and arts industries, supporting a diverse and workforce. As a result, the tertiary industry sector, which provides necessary services to raise living standards and promote economic growth, forms the foundation of contemporary economies. Due to its flexibility in responding to shifting consumer preferences and technology developments, it will continue to play a significant role in the world economy.

The circular economy concept, according to Aithal, S. et al. (2023) [1], is crucial for the primary, secondary, tertiary, and quaternary sectors of industry. This concept has a big impact on lots of different industry sectors since it promotes sustainable practises, resource efficiency, waste reduction, and innovation. In addition to generating economic value and reducing their negative effects on the environment, industries may help the transition to a more resilient and sustainable economy by embracing circular ideas.

According to Batouta, K. I., et al. (2023) [2], in light of the scarcity of natural resources and the rising cost of energy, the scientific community is becoming increasingly interested in developing novel strategies that will improve energy efficiency.

Kumar, S., et al. (2023) [3] recommend integrating big data technology and the underlying ICCT technologies in order to create a new type of business analytics that can be utilised to address semi-structured and unstructured issues in primary, secondary, tertiary, and quaternary industry sectors. The new inquiry is referred to as tech-business analytics (TBA). Understanding the concept of TBA and how it affects an organization's innovation outcomes is the main aim of this study.

Jia, W. et al. (2023) [4] assert that this article conducts a comprehensive and detailed analysis of China's forest industry chain and its effects on the national economy using the 2018 China Input-Output Table (153 departments), additional pertinent data made available by the National Bureau of Statistics, and the input-output method developed by Wassily Leontief. The findings indicate that there are 105 industrial departments in the Chinese forestry industry's backward industrial chain. With 56.05 percent of all purchases falling into this category, China's forestry industry makes the most tertiary industrial goods purchases. The tertiary industry's production has a significant negative influence on forests. China's forestry accounts for 93.47% of all forestry sales and sells the most items in the forward industry chain, which consists of 131 distinct industrial sectors.

Tech-business analytics are a tool that integrates data analytics and ICCT supporting approaches, in accordance with Kumar, S., et al. (2023) [5]. Prior to going on to secondary or quaternary industries, the industry's problems are first streamlined or fixed. The goal of Tech-Business Analytics is to employ technology and data analysis to enhance the characteristics and quality of goods and services across a range of industries. Analysing data from many sources is necessary to comprehend consumer behaviour, market trends, and other elements that may affect the success of a product.

The work of Tzeiranaki, S. T., et al. (2023) [6] contributes to our understanding of the tertiary energy usage and efficiency in the EU, as well as the driving forces behind it, the effectiveness of implemented strategies and measures, and suggestions for future research and new policy creation. Policies must be changed in order to meet the objectives established by the EU for 2030 and to provide the basis for reaching carbon neutrality by 2050.

This will be done, in accordance with Li, X. et al. (2023) [7], in order to set up a four-sector general equilibrium model and a rural industrial integration indicator to look into the effects of capital subsidies granted to capital-using sectors in rural industrial chains on rural industrial integration and social welfare. Here are what we've determined: Capital subsidies for rural areas can help close the economic gap between urban and rural areas and promote rural industrial integration (but only if specific short-term goals are achieved).

The information and service economies, which have become the main forces behind the expansion of the national economy, are primarily driven by the tertiary industry, according to Li, Q., et al. (2023) [8]. To support development in the central plain region and achieve structural convergence of industries for quick, wholesome, and long-term economic growth, it is crucial to conduct a spatial structural study of the evolution of the industrial structure. The dynamic and non-linear relationships both within and between industries must, however, be taken into account in traditional statistical analysis. This provides a novel geographical analytic approach based on the gravity model in this study to assess the tertiary sector in China's Central Plains Economic Region (CPER).

Primary, secondary, and tertiary industries in Saudi Arabia are together regarded as a pillar of the economy, with significant potential and promising job opportunities, according to Alkandi, I. G. et al. (2023) [9]. As a result, it is essential that both native and foreign enterprises operating in the Kingdom succeed. This study aims to investigate the effects of incentives and rewards on employee performance in the Saudi industrial sectors as well as the relationship between job satisfaction and both. The sample, which consisted of 216 full-time employees, was chosen from the research population, which was made up of employees in the industrial sectors of Saudi Arabia's Eastern Region.

A number of waves of secondary industry relocations have occurred in China during the past 20 years, according to Lin, B., et al. (2023) [10], where specific secondary industries have moved from one region or province to another. The secondary industries (mostly the industrial sectors) have a substantial impact on the regional carbon intensity because they contain a greater number of energy-intensive enterprises than the primary and tertiary industries do.

According to Aithal, P. S. (2023) [11] says that businesses are finding it difficult to survive and expand in the twenty-first century because of the numerous difficulties and uncertainties they must face. In order to sustain a business over the long term, it must be able to both keep its current clientele and draw in new ones. To do this, it must employ a variety of tactics for delighting, educating, and satisfying its current clientele while also generating a colossal amount of demand through the production of new business value.

According to Kumar, S., et al. (2023) [12], by integrating big data technology and the ICCT's supporting technologies, a new class of business analytics has been developed that can be used to

address semi-structured and unstructured problems that arise in primary, secondary, tertiary, and quaternary industry sectors. The newest study's working term is tech-business analytics (TBA).

Aithal, P. S., et al. (2023) [13] claim that technology is an application of science that is employed as a tool to address social issues. Innovations in the delivery of higher education are possible because to a component of ICCT. After COVID-19, the online education delivery paradigm gained prominence and was based on ubiquitous education technology (UET).

The goal of tech-business analytics, according to Kumar, S., et al. (2023) [14], is to employ technology and data analysis to enhance the features and quality of goods and services across a range of industries. In order to accomplish this, data from a variety of sources is used to spot patterns in consumer behaviour, market trends, and other elements that might affect how a product or service is viewed by a target market.

Technology, according to Aithal, P. S. et al. (2023) [15], is a science-based application that is used as a tool to address societal challenges. Because of an ICCT component, innovations in the delivery of higher education are now conceivable. Following COVID-19, the paradigm for online education delivery, which was based on UET, rose to prominence.

Kumar, S. et al. (2023) [16] recommend that the primary industry sector's TBA be the organisation of the effectiveness and sustainability of agricultural extraction activities. TBA can assist companies in this sector make data-driven decisions that will improve operations and lessen their environmental effect because of the primary sector's reliance on natural resources and environmental concerns. TBA, for instance, can assist agricultural companies by maximising crop yield by gaining access to information from weather sensors, soil sensors, and other sources.

According to Gupta, S. et al. (2023) [17], cloud computing encouraged the creation of agile software. Software is the new oil. Software that is open-source to a greater or lesser extent (70–90%) is inescapable. Open source promotes innovation through teamwork, shortens the time to market, and supports the development of recent ground-breaking technology. In some ways, open source is consuming or guiding the software industry.

According to Gupta, S. et al. (2023) [18], the population's rapid development has brought up the issue of securely keeping enormous amounts of data. With a cutting-edge approach to data encryption and hashing, problems with privacy, security, data processing, and other aspects can be overcome. Blockchain and the Internet of Things technologies will enhance the current ecosystem. The AES algorithm will be used by the proposed model to encrypt biometric and demographic data. Data will also be scrambled using the SHA-256 algorithm and stored in the symmetrically distributed Interplanetary File System (IPFS).

Varambally, K. V. M. (2023) [19] states that the primary objective of this study was to evaluate the ABCD analytical framework's Advantages, Benefits, Constraints, and Disadvantages of CSR in order to identify the crucial components and factors affecting value creation through CSR.

According to Mittal, V., et al. (2023) [20], solving sustainability issues requires that the transportation sector make the transition to carbon neutrality. In order to calculate the transport sector's carbon footprint as it moves closer to carbon neutrality, this study describes a model in detail. The model attempts to aid decision-makers by assisting them in predicting the potential effects of different decisions involving infrastructure and transportation technology.

According to Daradkeh, M. (2023) [21], there has apparently been much discussion about the value of business analytics (BA) in fostering knowledge creation and corporate innovation. The contribution of knowledge orientation and business analytics capabilities to the promotion of new business models, however, is poorly supported by actual data. This study develops a model to investigate the connection between knowledge orientation and BA capabilities and how it influences the development of business models. Both the knowledge-based view and the dynamic capabilities theory are used to achieve this.

Business analytics is a major force behind smart manufacturing, according to Wanner, J., et al. (2023) [22]. These authors attribute this to growing data availability, the development of data processing and transmission technologies, and the rise of data availability. But because of the diversity of local advancements and the field's transdisciplinary complexity.

According to Schmitt, M. (2023) [23], our rapidly evolving digital economy, which is moulded by international rivalry, calls for more data-driven based on AIML. The advantages of deep learning (DL) are numerous, but they are also constrained, which has prevented widespread industry adoption up

until this point. In spite of its popularity, this study discusses why DL struggles to gain traction in the field of business analytics.

Identifying the commercial value of big data analytics (BDA) is one of the ongoing issues in the field of information systems (IS) research, according to Muchenje, G., et al. (2023) [24]. To evaluate the phenomenon and gain a better knowledge of how BDA generates economic value, it is required to analyse theories in detail. The task-technology fit (TTF) concept is examined in this study to acquire a new and improved understanding of the business value of BDA.

By fusing systems provide planners and decision-makers with crucial and competitive information, according to Bharadiya, J. P. (2023) [25]. By improving the quality and timeliness of data, business intelligence (BI) strives to give managers a better understanding of where their organisation stands in relation to competitors.

According to Alnawayseh, S. E., et al. (2023) [26], cellular computing is an exciting and promising field. It is projected that the field's future developments would take a variety of shapes. The development of more sophisticated and efficient cellular-based computing systems that can manage challenging calculations and data processing tasks is one potential element. This could lead to the creation of new tools and technologies in a number of fields, including health, biotechnology, and environmental monitoring.

According to Penpokai, S., et al. (2023) [27], this is to investigate organisational constructs that are related to HR Analytics in large organisations that conduct business in Thailand. In order to analyse their interaction with the HR Analytics, this study introduces two organisational constructs: technology adoption and HR competencies.

According to Bag, S., et al. (2023) [28], the production and delivery of pharmaceuticals at the proper time, place, and quantity are a part of the healthcare supply chain. In a world of uncertainties, particularly hazardous pandemics, companies are focusing on the Omni channel healthcare approach, and one of the urgent aspects to accomplish is the digitalization of the healthcare supply chain. In order to empower absorptive capacity in Omni channel health care processes, a collaborative platform powered by big data analytics and artificial intelligence (BDA-AI) technology has been developed. The goal of this paper is to examine the background of this platform and its effects on organisation performance.

This research article's main objective, according to Fatima, A. et al. (2023) [29], is to identify common network risks and offer defences against them. Everybody has access to the internet in the present era. Security is a major concern for everyone. Expert hackers violate security every day and take advantage of flaws to access sensitive and private data.

According to Morales-Serazzi, M., et al. (2023) [30], this study provides evidence that the difference in information quality (DIQ) between knowledge producers and users (marketing) accounts for a major portion of the high failure rates in the execution of analytical projects for marketing decisions.

The practise of using data analysis to gather insights and make defensible business decisions is referred to in this paper as tech business analytics. This is frequently done with the use of technology and cutting-edge tools. This method entails gathering, processing, and evaluating data pertaining to many company areas, including operations, consumer behaviour, market trends, and more. The service sector, commonly referred to as the tertiary industry sector or the service industry, is one of the three main economic sectors. Instead of generating tangible commodities, it comprises activities that give services. The tertiary sector includes industries such as retail, education, healthcare, finance, hospitality, entertainment, and a variety of professional services. Understanding preferences, purchasing patterns, and trends through analysis of customer data can help organisations better adjust their services to fit the demands of their customers. improving operations through data analysis, resource allocation, and workflow management, which results in cost savings and increased operational effectiveness. Data analysis is used to keep track of market trends and rivalry, enabling businesses to modify their offerings in response to shifting customer needs. using data to develop individualised customer experiences, such as focused marketing initiatives or specialised service provisions.

2. EFFECT OF ADVANCES IN TECHNOLOGY IN TERTIARY INDUSTRY SECTOR:

Technological developments have fundamentally altered the way services are provided and made it possible for businesses to run more efficiently and profitably in the tertiary industry sector. The tertiary industry sector is affected in the following ways by technological advancements as listed in Table 1:

Table 1: Effect of advances in technology in service (tertiary) sector industries

S. No.	Aspects	Description
1.	Higher Efficiency	Businesses in the service industry may now automate numerous repetitive jobs and processes, which boosts production and efficiency. For instance, firms are now able to provide customer care more rapidly and efficiently thanks to chatbots and other automated technologies.
2.	Better Access	Technology developments have also made it easier for those who live in rural or underserved locations to receive services. For instance, telemedicine services and online educational platforms have made it possible for people to receive high-quality services from any location with an internet connection.
3.	Greater Individualization	Additionally, technology has made it possible for companies to offer more individualised services that are catered to the unique wants and tastes of their clients. For instance, client preferences can be determined and individualised recommendations can be made.
4.	Higher Competition	The ability of new entrants with cutting-edge business models and technologies to displace established service providers has boosted competition in the service sector as a result of technological advancements. As an illustration, online financial service providers have challenged established banks and financial organisations.
5.	Enhancing Data Analytics	Businesses can now gather and analyse enormous amounts of data, which has opened up new opportunities for insight and creativity. Data analytics, for instance, can be used to spot trends and patterns in consumer behaviour, which can result in new corporate strategies and better customer experiences.

As a result, technology improvements have had a significant impact on the tertiary industry sector, allowing businesses to provide services more effectively and efficiently while also altering the way services are offered. The advancement of technology will likely keep the service sector growing and innovating.

Over the past century, developed countries' economies have changed from being dependent on manufacturing to being dominated by the "service sector".

(1) Improved labour productivity. Increased worker productivity is primarily what causes tariffization. With improved technology and labour productivity, producers like farmers and manufacturers can produce more with fewer workers. Workers have more money to spend on services as a result of increased productivity. So that you can work in the tertiary industry, which requires more labour, save your labour.

(2) Globalisation. Globalisation and free trade have made it possible for the US, the UK, and other industrialised nations to import more produced goods.

(3) Income elasticity of demand. The majority of our money is spent on luxuries like travel and fine meals. Compared to raw materials, manufactured goods have a lower income elasticity.

(4) Technology. In the past century, both computers and telephones were developed. A completely new world of tertiary services has been made possible by the expansion of the internet. An economy dependent on services worries some individuals.

2.1 Effect of ICCT including Business Analytics in Service Industry:

The impact of ICCT and business analytics on the services sector has been enormous. The integration of ICCT with business analytics has the following implications in the service sector:

Table 2: Effect of ICCT underlying technologies in service industry

S. No.	Aspects	Description
1.	Increased customer satisfaction	ICT has made it possible for companies in the service sector to give customers a more individualised and practical experience. Businesses can employ mobile apps, for instance, to give customers immediate access to services, and data analytics can be applied to tailor recommendations and promotions based on the tastes of the audience.
2.	Enhanced Effectiveness	Businesses may now automate rote jobs and procedures thanks to ICT and business analytics, which boosts productivity and efficiency. For instance, companies can manage customer service requests using chatbots and other automated systems, and they can utilise data analytics to streamline processes and cut costs.
3.	Higher Level Decision Making	Businesses may now make more informed decisions based on data-driven insights thanks to the convergence of ICT and business analytics. Data analytics, for instance, can be used to spot trends and patterns in consumer behaviour, empowering companies to plan their marketing and product development strategies.
4.	Higher Agility	Additionally, organisations can now be more flexible to shifting market conditions thanks to ICT and business analytics. Businesses, for instance, can utilise data analytics to track trends and act swiftly in the event of changes in customer demand or rival activity.
5.	Improved Positioning in the Market	Businesses have been able to obtain a competitive edge in the market as a result of the integration of ICT and business analytics. Companies that can use data analytics, for instance, to understand consumer behaviour and market trends, are better positioned to provide novel products and services that cater to changing consumer wants.

Thus, the integration of ICT and business analytics has had a transformative impact on the service sector, enabling businesses to provide customers with a more individualised and convenient experience, increase productivity and efficiency, make better decisions, be more agile and responsive to shifting market conditions, and gain a competitive advantage. As technology advances, the combination of ICT and business analytics is anticipated to continue to stimulate innovation and growth in the services sector.

3. OBJECTIVES BASED ON PAPER :

(1) To analyse the thorough assessment and the significance of technology in the Tertiary Industry Sector.
(2) To evaluate the idea of tech-business analytics in the tertiary industry sector.
(3) To compare the Tech-Business Analytics model and its use in the Tertiary Industry sector.
(4) To interpret the TBA between the service business and the production industry.
(5) To study, using the ABCD analysis framework, the Pros, Cons, and Drawbacks of Tech-Business Analytics in the Tertiary Industry sector.
(6) To study the impact of tech-business analytics on the effectiveness of the sector of tertiary industry.

4. REVIEW BASED RELATED RESEARCH WORK :

Table 3: Business analytics in service industry

S. No.	Area	Issue	Outcome	Reference
1	To increase the competitive productivity of tourism	It consists of a framework for competitive productivity (CP), big data analytics (BDA) research, information systems	Through BDA, they seem to be doing a better job of achieving the goal of developing	Mariani, M. et al. (2021). [31]

	locations (CP), big data and analytics from a theoretically integrated approach are used.	for destination management, and smart travel destinations. It is a thorough conceptual framework for competitive productivity in tourism destinations (TDCP).	sustainable destination business intelligence to help tourism destinations accomplish their financial targets.	
2	Big data analytics and data security procedures affect how effectively the service supply chain operates.	It will look into the effects of big data analytics, data security, and supply chain innovation on the efficiency of the services supply chain. According to the study's findings, a company's capacity to manage data security and its performance and capacity for service supply chain innovation are both favourably and strongly correlated with big data analytics.	Since information was shared across participants in service supply chain networks, firms with weak data governance and protection faced problems with data security.	Fernando, Y. et al. (2018). [32]
3	In consumer-generated reviews, big data and business analytics are being used to investigate the key elements influencing visitor happiness.	In this study, UGC and business analytics are used to assess the important factors that influence hotel customers' pleasure. It also shows how business analytics methods can be used in the academic and hospitality sectors.	Through the use of business analytics, the current study lays a strong platform for future research into the relationship between specific evaluation variables and visitors' overall happiness. Analysing service gaps in these crucial criteria can assist hoteliers in addressing performance-related concerns.	Lee, M. et al. (2020). [33]
4	Supply chain efficiency and data analytics as digital procurement rises	With an emphasis on the function of data analytics in procurement digitalization, its goal is to examine digitalization as a performance driver for the supply chain. The study looks at how data analytics, digital procurement skills, operational efficacy in the supply chain, and their effects on business success interact.	The results show a substantial correlation between supply chain success and data analytics proficiency in digital upstream supply chain procurement operations.	Hallikas, J. et al. (2021). [34]
5	Study of the effects of linear and FsQCA on knowledge-based HRM, business analytics, and creative	As Industry 4.0 and the information economy evolve, many businesses are investing substantial resources in business analytics expertise and knowledge-based human resource management (HRM) practises. This study proposes a	The fsQCA results, however, showed that organisational agility is both a necessary and sufficient condition for obtaining high levels of inventive performance. However, obtaining	Enad Al-Qaralleh, R. et al. (2021). [35]

	performance in the hospitality sector.	conceptual model that uses knowledge-based theory as a theoretical framework to examine the combined effects of knowledge-based HRM practises, business analytics capabilities, and organisational agility on creative performance.	distinctive findings merely needs a strong analytical base.	
6	Pakistan's retail industry and "Business 4.0"'s effects on organisational performance	The robots, cloud computing, big data analytics, and Internet of Things (IoT) are the five essential Industry 4.0 technologies that it aims to assess and ascertain the effects of on the operational performance of Pakistan's retail sector. Senior-level employees who were aware of business 4.0 technologies were the target demographic, which was decided upon as the retail business in Pakistan. This group also includes subordinates who reported to first-level managers and higher-level employees.	The results provided preliminary evidence that disruptive technologies from Industry 4.0, such as 3D printing, big data analytics, cloud computing, IoT, and robotics, could help Pakistan's retail sector address a number of problems and challenges, such as low revenues, rising costs, and disorganised systems.	Ali, S. et al. (2021). [36]
7	Maintaining Competitive Advantage Through Knowledge Management and System Dynamics: Business Intelligence for Long-Term Competitive Advantage.	Future researchers in business intelligence will profit from it as it adds to the body of literature, especially in terms of achieving a sustainable competitive advantage. When considering the tools necessary to implement business intelligence, professionals will profit from the strategy. The study's applications may further be broadened by applying the research's findings to different economic sectors and geographical contexts.	The government, a number of businesses, and other parties involved in the Bangladeshi RMG industry can all benefit from the study's conclusions.	Ahmad, A. (2015). [37]
8	Using social media analytics and incorporating them into B2B marketing to take advantage of corporate networks in the social media era.	To facilitate the use of social media analytics (SMA) in B2B marketing and to harness the benefits of business networks in the social media era, it offers a capacity-based organisational development plan for SMA capabilities.	When it comes to using social media for B2B marketing, US-based companies appear to be well ahead of those in other nations.	Wang, Y. et al. (2020). [38]
9	Enhancing service organisations'	The marketing information system (MkIS) receives all of the emphasis in today's data-	The research increases theoretical knowledge of the resource-based	Rahman, M.S. et al. (2020). [39]

	competitive competitiveness in a data-rich environment	rich business environment, but the MkISMC's management capabilities are equally, if not more, important. While many service companies are looking forward to the return of MkIS, others are suffering.	perspective, market orientation, and dynamic capacity that create the interaction of MkISMC, UMAN, and SINM in achieving service businesses' competitive performance in the dynamic data-driven business environment.	
10	Instead of attempting to be "sexy," let's focus on educating managers for the (big) data-driven business era.	This essay will look at the challenges that the present business curriculum faces in order to address the learning issues brought on by the emergence of a data-driven corporate environment. It examines how digitization has affected businesses, focusing on big data analytics (BDA) and data science (DS), with a focus on managerial responsibilities and decision-making procedures.	Business schools and higher education should adapt, the study suggests, in order to more effectively meet the educational issues related to big data analytics and data science training. In order to achieve this, it uses case studies to stimulate conversation about how the rise of a data-driven business era is altering managers' duties and responsibilities.	Carillo, K.D.A. (2017). [40]

Table 4: ICCT in service industry

S. No.	Area	Issue	Outcome	Reference
1	Future Challenges and the European Air Transport Regulation's Successes	Following the development of the aviation single market, the policy has most recently been extended to cover the liberalisation and regulation of ancillary services as well as environmental protection, international aviation policy, safety, and security.	The EU will aim to strengthen its position as a global counterforce, symbolised by aviation, by setting the standard for environmental policies and market liberalisation.	Gudmundsson, S.V. (2019). [41]
2	Options for Cost-Effective and Long-Term Logistics	For long-term logistical success, efficiency gains are required but insufficient. Moving beyond cost-cutting or even cost-neutral programmes will be necessary for the industry to achieve its long-term energy savings and carbon reduction goals. In addition to emphasising the necessary next steps, we present these possibilities in a logical sequence.	The established method employed a 0–4 rating system to rank the contributions made to each of these four components by different enablers and practises discovered during a WSC's primary operations.	Smokers, R., et al. (2014). [42]

3	The cost of Volkswagen's Dieselgate scandal: exposed	This study tries to objectively establish an instance of business crises and events spreading over sectors and supply networks.	At the industry and supply chain levels of the analysis, it was discovered that the German automaker's fraud expanded to neighbouring enterprises.	Fracarolli Nunes, M. et al. (2016). [43]
4	The scandal over Volkswagen's excessive emissions	In order to pass emissions tests and meet rigorous fuel and performance targets despite emitting up to 40 times the permitted quantity of hazardous pollutants, Volkswagen admitted to US regulators in September 2015 that it had installed "defeat devices" in many of its diesel vehicles. The EPA postponed approving VW's 2016 diesel vehicles, and the firm ceased selling its 2015 models as a result of the recently disclosed facts. The defeat devices caused VW to report its first quarterly loss in more than 15 years, and this resulted in a decrease in the value of its stock.	Our predictions indicate that the Volkswagen scandal had a statistically significant and economically significant negative influence on BMW, Mercedes-Benz, and Smart's sales, stock returns, and public sentiment in the United States. With regard to these German non-Volkswagen manufacturers, the scandal directly led to a loss of sales of around 76,000 vehicles over the course of the next year, translating into a revenue loss of close to $3.7 billion.	Lynch, L.J., et al. (2016). [44]
5	Environmental policies that benefit innovation on a global scale	It demonstrates that petrol taxes would be too low without coordinated regional strategies, and that each region will use the petrol rating tax to lessen the harm caused by foreign traffic.	The moderating effect was found to be unfavourable but statistically significant. As well as numerous contributions from this research, assumptions about decision-making are made.	Kumar, M. (2019). [45]
6	Research on Radicalization as Transformative Learning: A Theoretical and Applied Study	In order to promote a multidisciplinary understanding of violent radicalization, this theory places a strong emphasis on how people learn, alter their meaning perspectives, and modify their behaviour.	Radicalization is the process through which someone becomes primed and inspired to engage in violent behaviour on both an emotional and cognitive level.	Wilner, A. et al. (2020). [46]
7	Apps for banking and online shopping use cloud computing and AI.	Customers won't grasp the task completely until it is finished, thus business intelligence (BI) combined with banking expertise will be a superior alternative in cloud computing. Even with their shortcomings, pricey,	Modern cloud computing, artificial intelligence, environmental elements that reduce BI delivery times, and rising BI expenses contrast with	Xue, M., et al. (2021). [47]

		complex, rigid, and integrated BI infrastructures aid in the blending of data from EC and banking apps. The cloud computing architecture is also examined in this study as a potential solution to problems with data processing.	the traditional BI of EC apps.	
8	An Indian case study illustrates how the sharing economy might help remove obstacles to the use of electric vehicles.	This looks at what the Government of India (GOI) has done and what needs to be done to boost R&D in the electric vehicle industry. The barriers to electric vehicle commercialization in India are outlined. Data collection, analysis, and assembly involve the use of secondary sources. Secondary data gives a detailed view of both the global and Indian situations.	The academic study of technology's adoption as a standard format has not been covered in prior works.	Kumar, R., Jha, et al. (2021). [48]
9	Examining India's economic, governmental, and product-standards experiences in connection to the global car industry	The document's structure is shown in the ensuing lines. The study opens with a succinct summary of the WP.29 Forum and European Commission's cooperation on harmonising vehicle regulatory requirements.	Additionally, these trading partners increase the value of India's exports.	Chakraborty, D., et al. (2020). [49]
10	Corrupt practises in the supply chain breach sustainability standards by dressing as sheep.	Private, voluntary, and enforceable sustainability norms have increased recently. Corruption in the supply chain has grown in popularity and now occurs frequently as a way to get past sustainability requirements.	However, strategies for getting past sustainability regulations, like supply chain manipulation, have proliferated.	Silvestre, B.S., et al. (2020) [50]

Table 5: Artificial Intelligence and Robotics in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	Customer evaluations of artificial intelligence-based service delivery and operational resilience.	The operations of service companies are progressively using artificial intelligence (AI). Production systems and operations management scholars claim that it is still uncertain whether	Customers' satisfaction with service operations is affected in an asymmetrical way by their interactions with mechanical AI: while positive interactions have a positive and significant impact on overall	Mariani, M. M., et al. (2023). [51]

		clients of operations receiving AI support are satisfied. This study applies the three-factor theory of customer happiness to online review data to close this gap by measuring the impact of AI-enabled service operations on total customer satisfaction as measured by online review ratings.	customer satisfaction with AI-enabled service operations, negative interactions have a negligible impact on customer satisfaction.	
2	Key ideas in 4.0 technologies and artificial intelligence for services	In fact, the Fourth Industrial Revolution, which is currently underway, differs from earlier technologies in three key ways: (1) As technology advances, human capabilities are outpaced to the point where individuals or even corporations are unable to control it; (2) customers accept living in newly created technological surroundings; and (3) the distinction between people and technology becomes increasingly hazy.	Each of these three separate features of Technologies 4.0 in services is connected to the fundamental AI ideas.	Belk, R. W., et al. (2023).[52]
3	Understanding the motivations for artificial intelligence adoption (or resistance) in the hotel industry: Exploring consumer-robot interaction.	Although there is a substantial body of research on AI services in the hotel business, additional research is necessary to understand consumer experiences with AI services and the factors that affect their adoption (or rejection) by consumers.	The factors that affect consumer behaviour towards AI and robotic services can direct the development and implementation of AI and robotic services in the hospitality industry.	Rasheed, H. M. W. et al. (2023).[53]
4	Advanced robotics uses deep learning, machine learning, and artificial intelligence.	Due to advancements in artificial intelligence, machine learning, and deep learning, robots are becoming smarter, more efficient, and more adaptive to difficult tasks and environments.	Additional research including the applications of AI, ML, and DL in sophisticated robotics systems is also advised in order to fill the gaps between the existing studies and published publications.	Soori, M., et al. (2023).[54]

5	AI in hotel and tourism industries. present research state and potential future directions	The travel and hospitality industries have lately seen a significant transition that has been fuelled by advancements in information and communication technologies. The scientific study on these topics is still hazy and dispersed, despite the expanding literature on AI and tourism.	In the study, a bibliometric analysis is built using the ISI database, and the intellectual structure of the study is mapped using social network analysis.	Nannelli, M., et al. (2023). [55]
6	Research on artificial intelligence (AI) for the travel and hospitality industries has lasted thirty years.	With a focus on the content, focal points, essential terminology, and trends of the subject, this study intends to assess the growth of artificial intelligence (AI) research relevant to the hotel and tourism industries.	These four clusters that make up the study of AI are: the technology of AI, the adoption of technology, the perception of consumers, and future developments.	Kong, H., et al. (2023). [56]
7	The "watching-eye" effect and privacy issues are two examples of artificial intelligence's negative side in use.	Artificial intelligence (AI) has the potential to raise privacy issues that should be carefully explored, but have not yet received sufficient attention. The watching-eye effect is used in this study to examine how privacy concerns act as a buffer between the impact of AI on customers' uneasiness and those worries.	Although both sexes are affected, women are more severely affected. This work makes a significant contribution to the corpus of knowledge on business ethics and service ethics in AI and provides advice on how to effectively address concerns about privacy and personal information.	Hu, Y., et al. (2023). [57]
8	Artificial intelligence's Place in Banking	While still utilising outdated technology, banks frequently contact with a variety of customers. Modern technological breakthroughs have almost automated all industrial operations from beginning to end, necessitating transformation in outmoded financial management organisations.	Automation enables institutions to boost earnings while enhancing overall performance and human reliance.	Umamaheswari, S., et al. (2023). [58]

9	Artificial intelligence chatbots providing live support: A research priority for the future	The results highlight the advantages and disadvantages of utilising responsive chatbot technology and offer light on important theoretical foundations focusing on human-computer interactions.	This contribution states that efforts are still being made to develop anthropomorphic, interactive chatbots that can mimic human customer service representatives.	Camilleri, M. A., et al. (2023). [59]
10	Investigating how artificial intelligence affects consumer repurchase intent: A mediation and moderation approach	Business practises and customer purchasing habits have been significantly altered by digital technologies. This study mixes artificial intelligence, social media interaction, conversion rate optimisation, and a positive consumer experience to analyse consumer repurchase intentions in the hospitality sector.	In order to please consumers and ultimately increase their willingness to use, share, and create content on social media platforms for hospitality organisations, marketers must consider how to make postings more engaging with videos, photos, and animations.	Nazir, S., et al. (2023). [60]

Table 6: Blockchain in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	These most important criteria for evaluating blockchain application services for public sectors	Innovative new services will develop as a result of merging blockchain with established industries' processes to better them, yet services that cannot be fully utilised by blockchain will also grow. This study looked into the elements to take into account while using blockchain technology's features into business practises.	Blockchain activity is expected to increase as industries undergo full-scale digital transformation.	Lee, J. et al. (2023). [61]
2	Blockchain: An engine for the next fintech revolution	The study and development of blockchain technology is currently popular. Following the blockchain proof of concept, the banking sector adopted the technology and changed the foundational ideas of finance. In the Fintech industry, problems including	In order to open up new doors for this industry, the financial services sector uses blockchain technology. Fintech applications of blockchain are another rising area.	Taherdoost, H. (2023). [62]

		missed deadlines, protracted fund-raising cycles, and escalating losses are common, and they frequently occur as a result of weak management.		
3	Blockchain-Internet of Things Applications: Opportunities and Challenges in Industry 4.0 and Society 5.0.	Numerous insurance companies have thought about how blockchain could boost their effectiveness. There is still a lot of anticipation about this immutable technology even if it hasn't been utilised to its full potential. Insurance companies must determine whether to use blockchain technology, just as many other businesses.	For Industry 4.0 and Society 5.0, this report delivers an in-depth investigation of IoT applications based on blockchain. For those who intend to continue their study of blockchain-based IoT applications, the following sections cover important topics such unresolved issues, challenges, and potential future research areas.	Tyagi, A. K., et al. (2023). [63]
4	Review of Blockchain Technology Adoption in the Travel and Tourism Sector From a Sustainability Perspective.	As new, creative business models develop throughout time, the adoption of Blockchain technology in the tourism sector is already a reality. Its primary goal is to improve the quality of service delivered to the final client and the effectiveness of the tourism service value chain.	The information gleaned from the investigation shows that operations in the tourism industry that involve marketing, logistics, and clever business models are utilising this technology to a higher extent.	Prados-Castillo, J. F. et al. (2023). [64]
5	Blockchain with Low Power in Industry 4.0	Significant technological advances and advancements have occurred in industry over the past ten years. Industry 4.0 and IIoT (Industrial IoT) are two trends that the industrial sector is going towards more and more. The Blockchain technology can be used to get beyond the IoT's constraints in terms of security and data reliability.	An effective multiservice approach is advised for water management. Customers and water service providers will benefit from services like consumption tracking, traceability, etc.	Frikha, T., et al. (2023). [65]
6	A dissected TPB model of how financial professionals	It is important because of how quickly blockchain applications have gained popularity among	The findings show that the research methods used in this study, which	Kumari, A., et al. (2023). [66].

	would use blockchain technology.	investment professionals. The goal of the study is to determine how widely blockchain technology is trusted and embraced in the Indian financial services sector.	involve users in formal contexts, are effective.	
7	ImseStudio is a platform for service manufacturing with blockchain integration that is secure.	The manufacturing industry is transitioning to a service-oriented model in the age of digitization. But a large number of small and medium-sized firms (SMEs) continue to rely on antiquated manufacturing techniques, finding it challenging to employ manufacturing resources due to their short budgets and limited capacity for digitalization.	It is an off-chain rule-based matching system is created to connect consumer orders with manufacturing services. and the entire blockchain platform is designed and developed using the major methodology known as service-oriented architecture (SOA).	Liu, X., et al. (2023). [67]
8	Model for cross-chain collaboration for geriatric health information that is supported by blockchain from the standpoint of the entire process.	As the population ages and fewer people have children, there is a growing need for older health care, which raises the need for elderly health information.	This is to build a cross-chain collaboration model for geriatric health information using blockchain technology with the help of the virtual chain's underlying logic.	Hu, M., et al. (2023). [68]
9	How to pick the best blockchain platform: A case study on the healthcare industry using a cutting-edge rough MCDM framework.	Manufacturers of medical products, insurance companies, third-party logistics (3PL) companies, and regulators are typically found in healthcare networks, which are complex systems. Modern technology should enable effective healthcare systems to offer patient care services that are both easily accessible and of the highest calibre in the long run.	This test presents a case example that explains how to pick the most useful BP for a healthcare institution. The findings of this inquiry are supported by numerous analyses.	Erol, I., et al. (2023).[69]
10	Pharma supply chain industry's blockchain-based solution.	Continent-spanning manufacturers, suppliers, and consumers are all included in the intricate supply chain systems used in modern pharmaceuticals. The	Smart contracts also control the way that businesses connect with customers by keeping track of IoT containers, including those containing prescription	Abdallah, S., et al. (2023). [70]

		transportation and sale of medicinal items supplied online currently suffer from a serious lack of transparency.	drugs, and properly informing them of any changes.	

Table 7: Cloud Computing in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	Utilising cutting-edge analytical technologies, these may evaluate the viability of cloud service providers for Industry 4.0.	It remains difficult to accurately assess how well Industry 4.0 technology providers, such as those that offer cloud computing and the Internet of Things (IoT), are performing. The effectiveness of cloud service providers (CSPs) for Industry 4.0 has been evaluated using developed and implemented methods.	By employing a real-world dataset to verify the viability of our methodology, it offers practitioners a practical method with solid academic basis for evaluating the sustainability of CSPs for Industry 4.0.	Azadi, M., et al. (2023). [71]
2	Cloud computing and energy efficiency empirical research.	As a result of cloud computing, the dynamics of energy consumption between service providers and clients have changed, necessitating a study of the effects on users in order to compare them to those on vendors. The effects of cloud computing on the environment may then be thoroughly understood thanks to this.	The results show that SaaS gives operational benefits by encouraging energy-efficient production, in contrast to IaaS, which primarily helps to reduce the energy consumption of internal IT infrastructure and equipment.	Park, J., et al. (2023). [72]
3	Utilisation of cloud computing and a significant data management challenge in the healthcare sector.	Data administration is often a massive duty in the healthcare industry. Millions of patients are involved, and it is important to carefully preserve the data for use in the public's and the general interest in the future. The healthcare sector is attempting to integrate cloud computing into their system in order to better implement their response to the problem.	The healthcare industry has benefited greatly from cloud computing. The healthcare sector is currently experiencing tremendous challenges as a result of the pandemic, and it is growing more and more reliant on cutting-edge technologies.	Sharma, D. K., et al. (2023). [73]

4	Analysing the connections between context, innovation, and cloud computing.	Since cloud computing has lately come to be identified as a key component of the technical ecosystem for digital transformation, this study aims to analyse how it contributes to digital innovation and how those two things are related.	The verifiable findings with illustrative statistics demonstrate how important cloud computing is to the process of digital transformation. Furthermore, it presents managerial implications for both hypothetical and real-world management scenarios.	Sharma, D. K., et al. (2023). [74]
5	In Nigeria, the advantages of cloud computing for environmentally friendly building are being investigated.	One of the digital transformation ideas employed in the banking, healthcare, and construction industries is the utilisation of cloud computing. This essay analyses how cloud computing might help with sustainable construction in Nigeria.	The results of the RII analysis show that data storage iniquitousness (i.e., location independence), high situational awareness, team communication, compatibility with cutting-edge manufacturing facilities, and enhanced project planning are all very advantageous.	Oke, A. E., et al. (2023). [75]
6	The advantages and difficulties of cloud computing in developing nations	Developing nations can benefit from a number of opportunities, including better access to technologies and services, by using cloud computing. Businesses might be able to employ equipment and software created with companies in mind if they have better access to technology and services.	Cloud computing adoption may be significantly hampered by worries about data security and privacy. This is because companies could not have faith in the security of their data if it is kept on servers situated in other nations.	Razi, M., et al. (2023). [76]
7	Trends in service industry digital transformation	The evolution of the DT in the service sector is examined in this paper. The 2,897,024 publications that published in journals that Scopus indexes between 1991 and March 4, 2022 were the subject of this investigation, for which researchers gathered data. Eventually, 1831 of the 2,683 papers were picked for examination after being reclassified.	The key developers of the three stages of DT in the service industry. The research's findings have theoretical and practical ramifications that offer strategic guidance for establishing and putting DT in the service industry into practise.	Chin, H., et al. (2023). [77]

8	The usage of digital twins in the oil and gas industry is being studied using edge and cloud computing.	Minor accidents in the oil and gas industry can have a big detrimental impact on the community, the environment, and the company. For this type of business, adequate operational procedures for monitoring and maintenance are crucial.	In order to establish a digital twin, it is essential that cloud and edge computing be used because they provide access to more storage and processing capabilities while removing the need for a strong local IT infrastructure.	Knebel, F. P., et al. (2023). [78]
9	Management and educational applications of cloud computing	Today's information and communication technologies work hand in hand to deliver the best business solutions. One of these current passionately debated and well investigated issues is cloud computing, which still has a tonne of room for expansion and research.	This study aims to look into the effects of cloud computing on academic institutions and business management.	Gupta, A., et al. (2023). [79]
10	Analysis of cloud-based ERP, or enterprise resource planning.	ERP management information systems are typically used for business expansion and operations. With integrated, systematic, and organisational management features, the effectiveness of various management resources, including enterprise customers, project operations, material procurement, supply, and production, is maximised in the company.	The ERP corporate management information system started consciously merging with the idea based on cloud computing's properties. In this paper, we mainly talk about the features and benefits of cloud-based ERP enterprise management information systems, and we also carefully evaluate the impacts of their adoption.	Duan, L. (2023l). [80]

Table 8: Forensic Technology & Cyber Security in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	Pakistan's Cyber Threat Analysis and Cyber Forensic Investigation Infrastructure	Cyber forensics are gaining popularity due to the explosive growth of technology crime. Cyber forensics' goal is to give situational awareness in order to recognise and preserve digital evidence, extract information, and analyse that information in order to support	The study's goals include giving policymakers an empirical basis on which to build a thorough CFI framework for the nation as well as insights and suggestions for enhancing the infrastructure to better	Haque, E. U., et al. (2023). [81]

		pressing decision-making. However, there is currently a lack of significant structure in Cyber Forensic Investigations (CFIs) that prevents them from reliably revealing the main patterns of cyberattacks.	combat cybercrime in Pakistan.	
2	An extensive review and survey of the literature on cyber security and cyber forensics for smart cities.	Towns and cities are implementing smart technologies like the Internet of Things (IoT), cloud computing, and artificial intelligence (AI) in order to become "smart cities." Smart cities have incorporated a number of network technologies, including the Internet and the Internet of Things (IoT), to share real-time information and improve the comfort of their citizens' daily lives. However, there aren't many comprehensive research on cybersecurity and cyber forensics in smart cities.	The Internet of Things (IoT) is a technology component of smart cities that has been the subject of numerous studies employing machine learning and deep learning since 2020. IoT devices transmit enormous amounts of data, and it is anticipated that ML and DL will continue to play important roles in research on smart cities.	Kim, K., et al. (2023). [82]
3	Examining the application of blockchain technology to digital forensics and cyber incident response.	In today's networked society, both governmental and non-governmental organisations as well as large, medium, and small businesses are vulnerable to cyberattacks. For a quick and effective response to an attack like a phishing or ransomware attack, each of these enterprises requires a trustworthy, or better yet, established and accurate reference database and platform for the correct analysis and storage of digital evidence.	Utilising this technology will help organisations respond to situations more effectively and increase their chances of apprehending and prosecuting cybercriminals. The report concludes with a discussion of the potential limitations and challenges of implementing blockchain technology and offers recommendations for further research to further the field of cyber incidence response.	Fakiha, B. (2023). [83]
4	India's adoption and knowledge of recent developments in cyber security	Due to the greater accessibility of goods, services, and applications brought on by the expansion of the internet,	To keep up with the accelerating pace of technology, cyber laws must be continuously improved. Financial aid,	Malik, N., et al. (2023). [84]

	laws and procedures.	much more rigorous security measures are now necessary to guard against cyber-attacks. Child pornography, cyberbullying, phishing, baiting, vishing, smishing, fraud with credit and debit cards, and job fraud are all common cybercrimes.	the initiative to prevent cybercrime against women and children (CCPWC), the Indian Cyber Crime Coordination Centre (I4C), the National Cyber Crime Reporting Portal, the Citizen Financial Cyber Fraud Reporting and Management System, the Information Technology Act of 2000 (IT Act), the Indian Penal Code of 1860 (IPC), the Indian Computer Emergency Response programme, the National Cybersecurity Framework (NCFS), and other laws and programmes are just a few examples.	
5	Issues, Problems, and Potential Solutions for Cloud Forensic	The popularity of cloud computing, which is a web-based utility model, cybercrimes that harm web-based systems are equally important to cloud computing. An immediate identification and location of the attack's source are required in order to perform a forensic investigation into a cyber-attack. Although substantial research on challenges and their solutions has been done in this area, research on techniques and strategies is still in its early stages.	Every stage of cloud forensics faces challenges, therefore before we can devise a thorough solution to address these issues, we must first know cloud technology and its forensics environment. Although there are papers that discuss cloud forensics, a document that compiles the most recent problems and answers is still lacking. This chapter has covered the cloud environment as well as potential dangers and attacks.	Akter, S. S., et al. (2023). [85]
6	Forensic examination of computer tools and systems is used to combat cybercrime.	Cybersecurity is now a global concern, and sophisticated and pervasive cyberattacks are on the rise. The integrity of digital evidence used in legal proceedings in the civil and criminal judicial systems is strengthened by computer forensics.	The employment of computer forensic techniques in the investigation and prosecution of cybercrime is suggested. Computer forensics can be classified into the following categories in this study: network forensics, mobile	Drobotov, S., et al. (2023). [86]

		The objective of this study is to develop proposals and suggestions for the application of technologies for forensic research of computer tools and systems in the fight against cybercrime.	forensics, malware forensics, electronic forensics, database forensics, and criminology of memory. According to the authors, there is no regulatory framework for international cooperation, digital evidence collection, or cybersecurity.	
7	Impacts of emergency cyber threats during emergency scenarios are among the difficulties to field hospitals' cybersecurity	The provision of emergency treatment and services is improved through the use of technology and IT resources in healthcare and by emergency response staff in field hospitals. However, these advantages raise more and more questions about the infrastructure's security, including that of medical equipment, health information, etc. This study examines how cyber threat actors use an ongoing emergency to exploit and attack the healthcare emergency response IT infrastructure. Healthcare is an appealing target due to its vast source of valuable data and its poor defences.	It also examines the opportunistic strategy employed by cyber threat actors and shows the inventive themes used by new vulnerabilities to successfully deploy social engineering campaigns and physical assault scenarios. It also identifies the effects of the cyberattacks on the stakeholders and the infrastructure for emergency response.	Ahmed, N. B., et al. (2023). [87]
8	Analysing research on cybercrime and security	As internet-based technology, goods, services, and networks proliferate, cybersecurity has become one of the most critical issues. Cyber forensics is a sort of treatment, whereas preventing cybercrime is a type of treatment. Both of these are essential components of digital security.	The study includes bibliometric results relating to the authors, organisations, nations, keywords, sources, and documents with the highest levels of international collaboration in the fields of forensics and cybersecurity.	Sharma, D., et al. (2023). [88]
9	Cybercrime-based digital forensics analysis, as well	The Internet has emerged as a key medium for the diffusion of knowledge around the world thanks	It is vital to bolster legislation, enhance pertinent mechanisms, and bolster supervisory	Chen, C., et al. (2023). [89]

	as research on the application of the rule of law to space administration.	to the social informatization that is developing so quickly.	capability in response to changing conditions and new policies. In order to guarantee that this objective may be accomplished, ideal technical tools and safeguards must also be established.	
10	A framework for compliance auditing and forensic analysis for protecting critical infrastructure.	Modern communities are becoming more and more reliant on the goods and services offered by Critical Infrastructure (CI), which includes manufacturing facilities, power plants, and networks for distributing energy. Due to their nature, scale, and complexity, such CIs frequently receive help.	By implementing the framework using a cloud-native technique, both the functional and non-functional requirements can be satisfied. Additionally, an experimental investigation of the framework's scalability is conducted.	Henriques, J., et al. (2023). [90]

Table 9: Digital Marketing and Business in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	An empirical investigation of how the usage of digital marketing and e-commerce impacted MSMEs' sustainability and financial performance during the COVID-19 outbreak.	This study set out to look at how the EC and DM platforms and strategies impacted MSMEs' capacity to function profitably and sustainably in the face of the devastating COVID-19 pandemic.	Digital marketing strategies were also found to have a big impact on how well MSMEs performed financially. However, it was discovered that there is little correlation between DM methods and the long-term viability of MSMEs.	Gao, J., et al. (2023). [91]
2	With the aid of bibliometric analysis of global research trends, the future directions of digital marketing in small and medium-sized businesses are visualised.	A bibliometric examination of the digital marketing research done by small and medium-sized businesses (SMEs) is the goal of this study. In the study, works over the last 20 years were subjected to performance analysis, co-citation analysis, bibliographic coupling, and scientific mapping.	It provides researchers with information on the state of research in the area of literature on digital marketing in SMEs and directs them in the right path. Future research directions are also given for this area of study.	Amiri, A. M., et al. (2023). [92]
3	Digital marketing is being used by	The tourism sector is a crucial part of society since it helps most	The evaluation of digital marketing usage in the tourism industry and a	Anuj, Upadhyay, R.

	Uttarakhand, India's tourism business.	nations' economies and social structures grow and thrive. Modern firms must increasingly incorporate digitization into their operations. It has altered the way that organisations operate and given one of the quickest platforms for interacting with customers. The tourist sector has seen a considerable transition thanks to digitization. Traditional tourism has changed thanks to digitization, becoming a modern, creative, and technologically sound sector.	suggestion for how to encourage more firms in Uttarakhand, India, to embrace digital marketing. This tutorial provides an illustration of the theoretical model along with an empirical test to see if the aforementioned things are connected.	K., et al. (2023). [93]
4	A survey of digital marketing in the medical field.	By using digital marketing rather than traditional marketing, hospitals can better understand sophisticated users. The objective of hospital marketing is to assess and understand the needs and preferences of potential patients in order to successfully address those demands. The costs of using the internet, email, and social media are lower than those of direct marketing, and they can close the gap and open doors for the promotion of services to remote clients. They can also make customers more aware of the services that are widely accessible.	A systematic review's method of choosing studies was used for this scoping review. Open Knowledge Maps and Google Scholar were used to compile pertinent studies. To apply digital marketing effectively, there is a need for innovation. Furthermore, online registration and media promotion can be done via hospital applications.	Chandra, A. F., et al. (2023). [94]
5	Alterations in attitudes and intents to purchase financial services and goods as a result of digital marketing and promotion techniques.	A sample of 400 people who watched financial commercials on YouTube, Facebook, etc. participated in an online survey that was carried out in India. Responses were obtained from 347 fully completed surveys. The interrelationships	The Technology Acceptance Paradigm (TAM) model, which measures consumer attitudes and intentions to purchase financial goods and services, serves as the foundation for the study paradigm.	Dogra, P., et al. (2023). [95]

		between constructs were examined.		
6	Digital marketing optimisation for the hospitality sector	Digital marketing is becoming a vital part of the hospitality industry since it enables hotels to engage with and reach out to potential guests. As the majority of people spend their time online, it essential. Currently, not all hotels take advantage of the chance to invest in yearly budgets to boost the efficiency of digital marketing techniques like social media, which merely makes promotions without engaging with followers, SEO investment, and online hotel reviews.	Hotels can use digital marketing effectively to draw in and keep consumers nowadays. The magazine's primary goal is to put forth digital marketing ideas for the various hotel target markets and the widest range of tourism stakeholders.	Bhandari, R., et al. (2023). [96]
7	Comprehensive evaluation of the body of research on SMEs and digital marketing.	The purpose of this study is to evaluate the body of existing literature on the application of digital marketing and its effects on SMEs. This study details how SMEs are affected by the adoption of digital marketing methods.	Although some SME companies use digital marketing, their outcomes are not comparable enough for us to recommend a particular strategy for doing so.	Jadhav, G. G., et al. (2023). [97]
8	Reviewing the current status of research on digital marketing in SMEs using data-driven techniques.	Digital marketing methods have emerged and are now used by both SMEs and large businesses as a result of the development of the Internet and the application of traditional marketing techniques. These businesses combine data sciences with digital marketing tactics to boost sales, build brand recognition, or break into new industries.	This is identified a total of seven state-of-the-art data science applications in digital marketing that are utilised by SMEs in their online marketing initiatives based on the findings. These programmes are examined and graphically displayed.	Saura, J. R., et al. (2023). [98]
9	The move from traditional to digital marketing, does it affect Ethiopia's organization's profitability?	The influence of transitioning from a traditional marketing mix to a digital marketing mix on organisational profitability is examined in the context of Ethiopia in this study. Descriptive	Since the digital transformation acted as a mediating factor, the independent factors collectively explained the majority of the variance in profitability.	Kebede, K., et al. (2023). [99]

		and explanatory study designs were created using qualitative and quantitative research approaches.		
10	Utilising digital advertising to its fullest potential for internet marketing.	Because to the expansion of the internet, business practises are changing, particularly those utilised in retail outlets where the viability of the business models depends on the ability to do transactions electronically.	In this case, social media is being used in digital marketing to boost sales, especially in e-commerce apps. In the era of globalisation, this is especially true.	Wuisan, D. S., et al. (2023). [100]

Table 10 : 3D Printing in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	An overview of 3D printing, medical image processing, and design for orthopaedic surgeons.	The result of technological and industry advancements, one medical specialty that closely follows technological advancement and adopts it into everyday practise swiftly is orthopaedic surgery.	In this study, it will go over the fundamental ideas behind these parts using Shapr3D and 3D Slicer as examples of CAD platforms and medical image processing platforms, respectively, from the perspective of orthopaedic surgeons.	Bahadır, B., et al. (2023). [101]
2	Resources and competencies for value in healthcare 3D printing services Co-creation.	The usage of 3D printing in healthcare is still in its infancy, although several service providers are promoting it among hospitals worldwide.	By providing knowledge, expertise, insights, and training to the surgical teams, the specialised developers are better able to boost hospitals' capacity to absorb 3D printing technology.	Chaudhuri, A., et al. (2023). [102]
3	The Modular Product Architecture for Sustainable Flexible Manufacturing in Industry 4.0 uses examples like the 3D printer and electric toothbrush.	To manage the effects of customised requirements on fluctuating market demand, industry 4.0, a flexible manufacturing system, and sustainability can be implemented.	As a factory grows, the modular design must be modified or reorganised in accordance with it.	Habib, T., et al. (2023). [103]
4	An analysis of the conceptual framework for a blockchain-based	Although 3D printing (3DP) has experienced fast expansion, it has also raised ethical and social questions. A couple such	The platform might support the worldwide digital assets IP protection process as well as the	Chan, H. K., et al. (2023). [104]

	authentication platform for the protection of intellectual property in the 3D printing industry.	examples are the capacity to print immoral items and IP infringement.	standardisation of the 3DP industry's development.	
5	Assessing the Cost and Utility of a New 3D Printing Service: Securing the Future.	In order to improve clinical results and deliver higher-quality care as personalised and precision medicine grow more common, the health care industry depends on rising technologies and innovations.	Recent developments in 3D printing technology have accelerated its adoption and extension into the healthcare industry while lowering costs and raising awareness.	Bastawrous, S. (2023). [105]
6	An academic hospital's utilisation and costs of 3D printing in the first year.	On the cost and advantages of implementing 3D printing at a hospital, little information is currently accessible. The goal of this study is to assess the benefits and costs of using radiography-based in-hospital 3D printing to create anatomic models in a single academic adult hospital.	Standards for anatomical model utility and cost Information about healthcare budgeting can be found in 3D printed medical models. It will take further research to fully grasp the financial benefits of the shortened procedure time.	Ravi, P., et al. (2023). [106]
7	Mass customisation models for cloud-based 3D printing services.	The outcome of speedy production, easy accessibility, and on-demand printing. Many service providers are emerging and offering 3D printers to enable bulk customization within their various service areas. According to technology advancement, these scattered 3D printers can be joined and shared via a cloud-based platform to produce bespoke goods in a flexible and reasonable environment.	To compare the performance of the two suggested models, numerical analyses are carried out. The findings show that in a large city, an optimization-based strategy is superior than a real-time strategy since, on average, the optimisation model may improve earnings by about 100%.	Kang, K., et al. (2023). [107]
8	Using models and actual data, the appropriateness of 3D-printed couplings for industrial application was investigated.	In this research, the use of additive manufacturing to reverse engineer spare components for flexible couplings is investigated.	An analysis of the environmental and economic factors was also finished. The 3D printed prototypes are suitable for swapping out the original, according to the results, under the original	Baladés, N., et al. (2023). [108]

			operating circumstances.	
9	A novel platform for comprehending and engineering microbiomes is provided by 3D printing of microbial communities.	Thanks to 3D printing, it is now possible to produce complex materials quickly on demand. Co-printing of matrices and microbes to produce personalised living materials has become common in recent years.	With the use of 3D printing, it is now possible to precisely arrange microorganisms in 3D space, offering a novel solution to these issues.	Krishna Kumar, R., et al. (2023). [109]
10	Experimental research on thin sandwich structures manufactured in 3D for use in energy-absorbing aircraft applications.	One of the biggest issues in aviation is the creation of lighter and lighter structures. The performance of the aircraft is improved by structural lightening, thus this has been a primary priority.	The current study fits into this framework since it investigates if sandwich panels may be made lighter by using a revolutionary production technique.	Acanfora, V., et al. (2023). [110]

Table 11: The Internet of Things (IoT) in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	IoT technology for circular business models present both opportunities and risks.	In order to promote improvements in environmental performance, circular business models (CBM) have become increasingly important. However, the current literature scarcely touches on the connection between CBM and the Internet of Things (IoT).	The need for case studies that measure CBM's ability to virtualize, exchange, and regenerate is substantial. IoT could reduce energy consumption by 20–30% for the applications indicated in the literature.	Ding, S., et al. (2023). [111]
2	Security problems with the Internet of Things (IoT) and research into remedies.	Consideration must be given to how the various needs of these practical applications will alter the dynamics of protection as smart devices are increasingly used in various contexts. The numerous security concerns, standards, and implementations' relationships to network safety are discussed in the study's summary.	It is necessary to consider reliable and usable IoT protection in order to retain information privacy, ethical behaviour, professionalism, honesty, encryption, intrusion detection, and the ability to recognise as well as versatility, interoperability, and usability.	Rekha, S., et al. (2023). [112]
3	Evaluating the situation and going forward	IoT has recently made great strides, which have accelerated the evolution of healthcare. Earlier	The co-citation network study also identifies other important areas, including cloud-IoT	Rejeb, A., et al. (2023). [113]

	with IoT in healthcare.	studies on IoT applications in healthcare are compiled in this article. An exhaustive evaluation and bibliometric analysis were done to provide an objective summary of the growth of IoT research in healthcare.	integration, fog computing, cognitive smart healthcare, and authentication procedures.	
4	Examining the internet of things' (IoT) application in the retail sector.	This study investigated how important success variables influenced the adoption of the internet of things (AOIoT) by Malaysian customers in the retail industry. 357 respondents were surveyed online and quantitative data were gathered using a cross-sectional methodology.	The results also showed that ATIoT had a positive and significant impact on Malaysian customers' AOIoT. Therefore, Malaysia's corporate community and important authorities should raise consumer understanding of IoT and change their views towards it.	Nawi, N. C., et al. (2023). [114]
5	In Ghana's construction business, new technologies for industry 4.0 and the Internet of Things (IoT): feasibility, deployment challenges, and benefits.	Despite embracing these technologies later than other sectors, the construction sector is currently facing significant difficulties. Construction is one sector that takes a while to adopt cutting-edge technical instruments.	This study focuses on the construction industry community, which broadens its applicability by introducing important stakeholders and individuals who will be affected by these technologies.	Maqbool, R., et al. (2023). [115]
6	Big data analytics (BDA) and the Internet of Things (IoT) are used in digital manufacturing.	Three exemplary enabling technologies for data collection, processing, and use in manufacturing applications are introduced: digital manufacturing (DM), big data analytics (BDA), and the Internet of Things (IoT). Enterprise information systems are thought of as information systems that gather, process, and apply data to support enterprise decision-making at all organisational levels and functional divisions.	It is suggested that a new EA be used to improve the system's adaptability, robustness, and flexibility. To identify critical research areas and provide instructive application-based examples, the potential of the proposed EA for modern manufacturing is studied.	Bi, Z., et al. (2023). [116]
7	A comprehensive study dispelling myths about the	Internet of Things (IoT) adoption in the construction sector is still relatively uncommon	The purpose of this study was to give resources for construction managers	Khurshid, K., et al. (2023). [117]

	Internet of Things (IoT) in the construction business.	despite the fact that it has quickly extended across many industries in the current digital era. Construction 4.0 is driven by technologies like structural health monitoring (SHM), business information modelling (BIM), procurement, and construction safety.	to identify problems, for professionals to examine the hybridization potential of IoT in the framework of Construction 4.0, and for laypeople to understand the advanced scientific research that supports IoT in the construction industry.	
8	Investigate the desire of undergraduate students to use internet of things (IoT) services in the smart classroom using a case study.	There has recently been an increase in interest in the education sector due to the use of Internet of Things (IoT) services for educational purposes. There aren't many studies that specifically examine how IoT services are used in smart classrooms, despite this enthusiasm. In order to better understand students' motives, the current study looks at their intentions to use IoT services in the smart classroom.	Our knowledge of how students plan to use IoT services in the smart classroom is enhanced by the study. Academics, teachers, and IoT developers could find this study useful. However, it has significant drawbacks, such as a lack of qualitative techniques and a sparse use of theories.	Alhasan, A., et al. (2023). [118]
9	With the aid of internet of things (IoT) enabled technology, COVID-19 patient healthcare help.	Research articles on COVID-19 pandemics and IoT in healthcare are examined to examine the potential of this technology. This literature-based research has the ability to provide solutions to connected issues for the specialists who will be addressing the COVID-19 pandemic.	IoT implementation done right could help with a variety of medical issues, including complexity, price, and speed. For individuals with COVID-19 asthma, diabetes, and arthritis, it may only need to be modified to track caloric intake and treatment.	Mukati, N., et al. (2023). [119]
10	Effects of logistics and Internet of Things (IoT) activities on digital operations.	The Internet of Things (IoT) paradigm allows numerous integrated, resource-constrained devices, things, and people to continuously exchange data with one another over the internet protocol.	A quantitative approach employing a descriptive and analytical strategy was used to further this research. Data from 199 respondents that were gathered from security-related businesses in Dubai, United Arab Emirates, were used to make the assessment.	Antouz, Y. A., et al. (2023). [120]

Table 12: Data Storage in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	How the quick service restaurant industry's in-store electronic word-of-mouth is affecting local competition spillovers.	It is simpler to switch behaviours due to the quick service restaurant (QSR) market's fierce competitiveness and close proximity. QSRs have experimented with menus as a result, developing customised experiences.	The study's findings support the theories that parasocial (non-face-to-face) interactions like likes, retweets, and replies fully mediate the impact of in-store engagement on visits from nearby competitors over the course of the following 30 days and that the direction of this effect can change with competitor density in the neighbourhood.	Banerjee, S., et al. (2023). [121]
2	Overview of Industry 4.0.	In order to make quicker, more informed decisions that will ultimately boost the efficacy and profitability of their overall organisation, businesses are constantly looking for ways to access real-time data and insights.	This also investigates the use of blockchain for sustainable development and Industry 4.0, as well as providing a quick overview of the different connected technologies.	Hayat, A., et al. (2023). [122]
3	Utilising Industry 4.0 technologies to support small service businesses.	It can be difficult for managers of service MSMEs to incorporate Industry 4.0 (I4.0) into their organisations, despite the promise that it will help MSMEs become more sustainable.	Theoretical contributions, constraints, and potential directions for further study have all been examined along with a number of management implications.	Pandya, D., et al. (2023). [123]
4	Comparing Risks and Effectiveness of Enterprise Data Security Measures Across Sectors and Organisational Types.	In the study, data security practises of various business sectors and business kinds, including small businesses, large corporations, and government organisations, are evaluated in order to determine how these practises affect the effectiveness of their security measures.	Organisations may benefit from the findings by strengthening their data security procedures and lowering their risk of security incidents.	Bandari, V. (2023). [124]
5	Cloud computing is used by maritime logistics for	The number of supply chains and supply chain players is constantly increasing, which is not surprising given that	In this study, the authors outline the marine cloud's detailed organisational structure	Röseler, C., et al. (2023). [125]

	effective data processing and storage.	maritime logistics is the largest logistics industry by volume and financial value allowing global trade.	and contrast it with traditional systems.	
6	To maintain privacy in industry 5.0, FusionFedBlock fuses blockchain with federated learning.	The current, rapid changes being brought about in different industries by the digital environment are referred to as "Industry 5.0" The industrial setting requires the use of contemporary technologies, such as the Internet of Things (IoT).	With accuracy of 93.5% in a 50% active node for Industry 5.0, the validation findings of the recommended scheme show good performance in comparison to existing frameworks.	Singh, S. K., et al. (2023). [126]
7	Adoption of distributed ledger and decentralised technology to facilitate the shift to smart industries.	In order to undergo digital transformation, industries are currently implementing clever initiatives and cutting-edge business strategies. One of these projects is the use of distributed ledger technology (DLT), which has the potential to promote the smart industrial revolution.	The consequences of the study will be useful for industry regulators, practitioners, and academics who are curious to learn about the cutting-edge ways that clever industries may use DLT to generate value and gain a competitive advantage.	Anthony Jr, B. (2023). [127]
8	Building an intelligent tool swarm in Industry 4.0 that distributes knowledge necessitates the use of multi-access edge computing enabled architecture.	Thanks to Industry 4.0, which has piqued the interest of both academia and business, the development of intelligent machine tools is currently front and centre for industrial enterprises to take a step towards intelligent production.	Using a prototype system, the suggested strategy's practicality and effectiveness are demonstrated. It is used in its application examples and evaluation tests.	Zhang, C., et al. (2023). [128]
9	An examination of how digitization will affect the hospitality and tourism industries' values.	This study's goal is to critically assess the most recent technological developments and digitalization initiatives in the hospitality and tourism (HT) industry, as well as to talk about how these changes will affect different stakeholders (including clients, employees, businesses, and operators) in terms of value creation..	The report contends that digitalization is still in its early stages. However, there are several ways for all parties involved to gain from current and future applications of digitization.	Ozdemir, O., et al. (2023). [129]

10	Using multi-stage authentication from cloud databases, efficient safe cloud data storage and retrieval	Cloud computing is becoming a significant player in the information technology sector thanks to its increased efficacy, broad accessibility, low cost, and several advantages. Similar to this, it gives Internet users extra storage space and makes it possible for speedier data transmission between sites.	The image is broken down and kept in the cloud clearly as an encrypted message and a fingerprint in order to prevent unauthorised access. The key value that is encrypted and decrypted is properly chosen using a search method to increase system security.	Babu, T. K., et al. (2023). [130]

Table 13: Quantum Computers in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	Healthcare innovation in Covid-19 was propelled by quantum computing.	In the Covid-19 era, where rapid coordination between stakeholders including patients, insurance agents, healthcare professionals, and pharmaceutical suppliers is necessary, a standard computer strategy is insufficient. Quick and accurate healthcare solutions are also essential.	The results point to potential uses for quantum computing in the pharmaceutical, hospital, and health insurance industries as well as for patients to quickly and precisely solve issues.	Gupta, S., et al. (2023).[131]
2	Utilising quantum computing to address future industry security issues related to 5G.	The development of upcoming 6G networks has taken centre stage since the deployment of 5G in a few countries around the world. The entire society is now connected thanks to 5G. More data exchange is now possible thanks to ubiquitous internet. Even though 5G offers reduced latency, larger data rates, and high-speed, there are still some security-related flaws.	The 6G network cannot be secured with traditional cryptography alone. Through the use of quantum mechanics, all conventional cryptography may be broken. As a result, modern security methods should be used in their stead.	Mangla, C., et al. (2023). [132]
3	The Development of the Quantum Computing Industry: The Main Obstacles to the Adoption of QC	Industries throughout society are transforming as a result of new digital, disruptive technology. The burgeoning Quantum Computing (QC) sector is also no exception. Governments, major	According to the study's findings, the QC sector is still in its early stages. Of the 34 adoption barriers identified, eight were determined to be the most important due	Nguyen, K., et al. (2023). [133]

	Technology as a Service.	corporations like IBM and AWS, as well as smaller to medium-sized businesses, have all made enormous financial contributions to the development of QC technology.	to their importance and frequency of reference.	
4	Medical applications of quantum computing.	The multidisciplinary field of quantum computing has recently expanded swiftly and garnered substantial interest from both academia and business due to its ability to handle information in fundamentally unique ways and achieve processing powers that were previously unachievable.	It has developed taxonomies in a number of areas, such as background and enabling technologies, applications, needs, architectures, security, open problems, and potential future research topics.	Ur Rasool, R., et al. (2023). [134]
5	An overview of the key problems in quantum communications and computation.	There has been a vigorous scramble for quantum technologies in both academia and industry since the development of quantum technology has progressed so swiftly. Quantum annealers function at scales three orders of magnitude larger than hundreds of qubits, or universal quantum computers. Numerous hundreds of qubits have been supported by universal quantum computers.	So, a substantial number of academic papers and other publications have addressed the subject of race. From a computer science perspective, this essay offers interested readers a starting point for learning about the essential traits of quantum computing and communications.	Yang, Z., et al. (2023). [135]
6	An examination of the tools used by the sector and in open source to produce quantum software.	Quantum computing, an advanced level computing paradigm built on the fundamental principles on which nature functions, notably quantum physics, has the ability to perform complex computations and huge potential to set trends in the new era of computing technology.	Since it differs slightly from conventional computing, quantum computing must be implemented using specialised software. Additionally, a list of exclusive resources provided by leading businesses is available.	Mehta, D., et al. (2023). [136]
7	Using new technologies in the service industries.	Modern technologies such as Artificial Intelligence, Blockchain, state-of-the-art hardware, Quantum Computing,	Within the next five years, the world's economy will transition from smartphones to cutting-edge wearables	Jha, R. S., et al. (2023). [137]

		self-driving cars, machine learning, Virtual and Augmented Reality, Extended Reality, the Enterprise Metaverse, and the Internet of Things, collectively referred to as "Industry 4.0," have had a profound effect on society.	as the fifth generation mobile network (5G) rollout is completed, with augmented reality (AR) glasses setting the pace.	
8	Risk mitigation and sector-specific strategies to accelerate quantum readiness.	It can be challenging for sectors to know where to start given the potential effects of quantum computing on a number of industries, including finance, healthcare, encryption, and transportation. It is crucial to start looking at what needs to be done as soon as possible in order to provide industry with the knowledge, tools, and processes needed to stay up with the quickly evolving breakthroughs in quantum computing.	One method to get ready for quantum computing is by opening a quantum computing office, signing contracts with important quantum computing companies, and learning from organisations that are already involved in the field.	Alsalman, A. I. S. (2023). [138]
9	The 2021 BMW Quantum Computing Challenge is the method used by Supplierthon.	The BMW Group has a supplier scouting method called "Supplierthon" that works especially well for locating partners on R&D projects. This article describes the supplierthon process developed by BMW and describes how it was applied as the company sought out new partners for the introduction of quantum computing.	In order to comprehend how the process works, how it was applied to the issue of quantum computing, and what the results—both expected and unexpected—were, three members of BMW's quantum computing and business development teams were questioned.	Sotelo, R., et al. (2023). [139]
10	Creation and Implementation of Quantum Web Services.	Increasingly potent quantum computers and associated technology have been created as a result of interest in quantum computing among scientists and industry. Programming languages, simulators, and working quantum computers have all been developed by major computer corporations. In	It gives a general overview of how quantum algorithms can be turned into web services, deployed using the quantum computing platform Amazon Braket, and called using traditional web service endpoints. Finally, we'll provide a method for developing and distributing quantum	Romero-Álvarez, J., et al. (2023). [140]

		a manner comparable to Infrastructure as a Service, this infrastructure is accessible through the cloud.	services by extending OpenAPI and GitHub Actions.	

Table 14: Online Education in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	A review of innovative big data-driven online education initiatives used during the COVID-19 pandemic.	Some colleges and institutes have started offering online courses. Through in-depth online instruction and student health checks, teachers help students finish the required learning material and return to class as soon as is practical.	In light of the recent coronavirus epidemic and in light of the issues and challenges faced by creative online education, the thesis can be used to understand these issues and difficulties and to look into the future.	Cui, Y., et al (2023). [141]
2	Using term subject analysis, we may identify the key technologies of knowledge services in the publishing sector.	For administrators and academics in the publishing sector, the analysis of the technical position of the industry is crucial for planning and making choices. We searched and examined the present hot technologies and future trends of knowledge service in the publishing business from the basic and application perspectives.	Our findings indicate that: (1) data analysis and artificial intelligence are crucial to the fundamentals of publishing technology; (2) blockchain and digital advertising are crucial to publishing applications technology.	Bo, F. A. N., et al. (2023). [142]
3	Re-evaluating Education in the Age of AI: Appreciating the Importance of Long-Lasting Skills.	NACE's creation process Despite the fact that AI has the potential to broaden the diversity of learners and enhance learning outcomes, it is more crucial than ever that enduring skills and competencies like communication, critical thinking, creativity, leadership, adaptability, and emotional intelligence are purposefully incorporated into curriculum design.	The education system & AI-driven, and it emphasises the significance of curriculum design and conventional teaching methods in producing a unified educational experience that gives students the opportunity to build lasting abilities.	Hutson, J., et al. (2023). [143]
4	Brick-based classrooms gave way to click-based classrooms during the pandemic. The factors that	The most crucial element in determining success in any service environment is the consumers' opinion of the quality of the service or product, which generates satisfaction and loyalty. Since online instruction has	The study seeks to stimulate further investigation on how to enhance learner experience and enhance click classroom services to provide high-quality	Paposa, K. K., et al. (2023). [144]

	influence the level of service and student satisfaction in click classrooms will be discussed in this essay.	become the new standard in the wake of the pandemic, the current assessment focuses on the service quality of this innovation.	education to all stakeholders.	
5	Benefits and Challenges of Involving Industry in Training for Health Professions	The learning and job preparedness of students in the health professions are facilitated by productive relationships between institutions and business. But creating a lasting industry participation in academic curricula is still difficult.	Context Mechanisms 3 Engagement as an opportunity, partnerships, and job preparedness were found to be outcome configurations that enable engagement outcomes.	Kenny, B., et al. (2023). [145]
6	Trends in the service sectors' digital transition	Through actual application cases and articles from DT-related media, this study investigates the growth of digital transformation (DT) in the service business. In order to conduct this analysis, researchers gathered 2,897,024 papers that appeared in Scopus journals between January 1, 1991, and March 4, 2022. 1831 of these 2,683 items were then picked for inspection after being categorised.	This study looked at the main causes of DT at each of the three stages of its emergence in the service industry. Strategic insights for DT strategy and execution in the service sector are provided by the study's findings, which have both theoretical and practical repercussions.	Chin, H., et al. (2023). [146]
7	COVID-19's effects on the service sector: bibliometric analysis's findings	The basis for the bibliometric choices made in this study is performance analysis and science mapping. The performance analysis is organised by examining the research components' contributions.	In particular, the aviation and tourist industries have been significantly impacted by COVID-19, as have the majority of service-based industries.	Chen, S., et al. (2023). [147]
8	Career education is becoming digitalized during a crisis.	The grade of vocational training must be raised by rapid technological development and adoption across all economic sectors. On the other hand, digital technologies enable a variety of training methods to be used depending on the demands made by different circumstances.	However, as recent experience has demonstrated, the advent of online learning was the only viable solution to keep it going during the COVID-19 and now when school premises are unavailable due to the conflict.	Kovalchuk, V. I., et al. (2023). [148]
9	Food and beverage service industry's use of	Many countries responded to the COVID-19 epidemic. Retailers in rich nations	This expansion was made possible by the flexibility of the	Walcott, P. A. (2023). [149]

	e-commerce as a catalyst What industry makes up the food and beverage sector in Barbados? Caribbean and COVID-19: Interdisciplinary Viewpoints.	have utilised e-commerce to get past laws governing public health, such as those requiring physical separation. In contrast, the adoption of e-commerce has been sluggish in developing nations due to a lack of funding and insufficient payment networks.	technology used, the order placement, payment, and fulfilment procedures implemented, the cooperation of FSBs, and government assistance.	
10	Internet business opportunities in the domestic transportation sector	All economic sectors, including transport, are given new chances by information technology and the digital economy. As a result of the information technology's rapid development and adoption, transport economics is currently undergoing significant changes.	The global economy has changed as a result of the tremendous advancement and application of this technology. In the modern economy, where the global market is typified by competitiveness, diversity of goods and services, and quick product cycle times, transportation enterprises must prosper.	Selivanov, V. V., et al. (2023). [150]

Table 15 : Virtual and Augmented Reality in Service Industry

S. No.	Area	Issue	Outcome	Reference
1	Experiencing consumerism and one's self through a magic mirror augmented reality system.	This study's goal is to investigate the implications for users of augmented reality (AR) beauty mirrors from the perspectives of experiential consumerism and the extended self.	The data revealed two key themes: (1) the value of fantasy and imagination, and (2) the (in)authenticity of one's self and of their surroundings as "reality."	El-Shamandi Ahmed, K., et al. (2023). [151]
2	A ground-breaking investigation into the Digital Twin for upcoming augmented reality-based human-centered industry transformation.	More research is being done on this junction since digital twins (DT) and augmented reality (AR) have recently started to show their promise. Given the present trend towards human-centric design, the upcoming generation of Human Cyber-Physical System (HCPS), of which DT is a key component, embraces the potential for integrating operators.	The difficulties and potential effects of AR-assisted DT for a future human-centric industry transformation—including improving product design, robotics-related work, cyber-physical interface, and human ergonomics—are examined.	Yin, Y., et al. (2023). [152]
3	The influence-peddling capacity of	A conceptual model of affecting consumer attitudes through virtual	It was discovered that in virtual reality and augmented reality	Jayawardena, N. S., et al. (2023). [153]

	augmented reality (AR) and virtual reality (VR)-based video ads.	and augmented reality marketing is provided using the social psychology theory of elaboration likelihood model (ELM).	marketing, elements such as the source's authority, social presence, and the content of the message all had a persuasive effect.	
4	Making Virtual and Augmented Reality Opportunities Available Will Revolutionise Healthcare.	It was discovered that in virtual reality and augmented reality marketing, elements such as the source's authority, social presence, and the content of the message all had a persuasive effect.	Data privacy and security issues could occur when the dentist and support personnel manage data.	Mehta, K., et al. (2023). [154]
5	Designing services for augmented reality to improve consumer experiences in retail.	Retailers are increasingly using augmented reality (AR) technologies to enhance consumer interactions and provide better customer experiences. Although AR's potential has been shown in laboratory studies, its commercial impact on real-world applications has been quite small.	Application of the design thinking methodology aids in the successful development of AR services. The essay also offers guidelines for applying the design thinking method in the unique context of augmented reality with the aim of improving customer experiences.	Vaidyanathan, N., et al. (2023). [155]
6	Augmented reality consumer engagement and staff services to boost equality and loyalty	In a physical store context, this project will make use of augmented reality (AR) and people services to more accurately gauge customer equity and loyalty. In regard to AR-based and staff service, the current study examined the connections between customer satisfaction, equity, and loyalty.	Important insights into employee services and augmented reality in a physical store environment are provided by the findings. Customer use of AR services is more prevalent in the contemporary business environment.	Butt, A., et al. (2023). [156]
7	The ability to visit both online and offline businesses and user trust in augmented reality apps must be examined in order to fully grasp how mobile augmented reality is digitally	The study's goals were to find out whether (1) aspects of expectancy-value judgements (EVJ) of uses and gratifications, such as novelty, fashion/status, sociability, and relaxation, influenced trust in augmented reality (AR) apps, and (2) whether trust in AR apps affected usage intention towards AR apps and online/offline store patronage intention.	Users' trust in AR apps, according to the study, was crucial in predicting users' intentions to use AR applications and their propensity to purchase at both online and offline stores. EVJs' perceptions of AR apps were influenced by the novelty, style, and status of their usage and gratifications.	Kang, J. Y. M., et al. (2023). [157]

	revolutionising the retail sector.			
8	A thorough analysis of the literature on augmented reality-based maintenance applications in manufacturing that are geared towards operator requirements.	Smart manufacturing, supported by cutting-edge Industry 4.0 technology, enables mass customisation of goods. Augmented reality (AR) has frequently been utilised to automate manual processes with ambient intelligence by overlaying virtual data over real-world situations. In most contemporary factories, maintenance is still a labour-intensive or somewhat automated process.	The maintenance operations reviewed in previous research have been grouped into four consecutive parts using a general procedure, and the classification outcomes have been examined using the location, kind of maintenance, AR technological components, and integrated external sensors.	Runji, J. M., et al. (2023). [158]
9	Factors affecting an effective adoption of augmented reality in manufacturing firms for the delivery of industrial services.	In order to make it simpler to offer industrial services and technical support to their installed base, the study combines a review of the literature with an empirical investigation of how five important industrial enterprises employ augmented reality.	The authors categorise 18 factors that manufacturing businesses should consider when deploying AR technology to enhance industrial services into four categories: task, personnel, context, and technology.	Aquino, S., et al. (2023). [159]
10	The metaverse era: utilising augmented reality to create cutting-edge customer experiences.	The major goal of this study is to illustrate how augmented reality's (AR) augmentation, interactivity, personalisation, spatial presence, novelty, entertainment, and in formativeness qualities can improve online customer experience (OCE).	It is emphasises the significance of media richness theory in providing a novel framework for understanding the relationship between OCE and AR features.	Habil, S. G. M., et al. (2023). [160]

5. METHODOLOGY :

In order to collect, analyze, and use data to make wise decisions that promote growth and efficiency, a methodology for tech business analytics in the service industry sector must be developed. A thorough methodology is provided here:

(1) Define Business Objectives: Start by defining clear and precise company goals that analytics can aid in achieving, such as enhancing customer satisfaction, streamlining processes, or boosting income.

(2) Data Collection and Integration: Gather data from various sources within your organization, including customer databases, transaction records, website analytics, social media, and third-party data sources. Integrate data from different systems to create a centralized data repository.

(3) Data Cleaning and Quality Assurance: To guarantee precision and consistency, clean and preprocess the data. Find any incorrect or missing data and fix it.

(4) Data Storage and Management: Organize and manage the combined data using a data warehousing technology. To protect sensitive information, implement appropriate data security procedures.
(5) Data Analysis Tools and Techniques: There are several pertinent data analytics techniques and processes, including data mining, machine learning, and statistical analysis. Get the necessary training yourself or hire specialists with it for your workforce.
(6) Key Performance Indicators (KPIs) Selection: Define relevant KPIs that align with your business objectives. Examples include customer retention rate, average transaction value, and service response time.
(7) Data Visualization: Create meaningful visualizations, such as charts and dashboards, to present data insights in an understandable manner. Use tools like Tableau, Power BI, or custom-built dashboards.
(8) Predictive Analytics: Implement predictive models to forecast future trends and customer behavior. Use machine learning algorithms to make data-driven predictions.
(9) A/B Testing and Experimentation: Conduct controlled experiments to test hypotheses and optimize processes. Measure the impact of changes on key metrics.
(10) Business Intelligence Reporting: Generate regular reports and alerts for stakeholders to monitor KPIs and track progress. - Ensure that reports are actionable and provide insights for decision-making.
(11) Continuous Improvement: Create a feedback loop based on analytics insights for ongoing improvement. Adapt strategies and techniques as necessary to achieve company goals.
(12) Data Governance and Compliance: Make that data protection laws, like the CCPA or GDPR, are followed. - uphold standards for data privacy and quality.
(13) Team Collaboration: Promote cross-functional collaboration between data analysts, IT, and business units. - Encourage knowledge sharing and data-driven decision-making culture.
(14) Technology Stack: Invest in the right technology stack, including cloud infrastructure, data analytics tools, and security solutions.
(15) Scalability and Flexibility: Design the analytics framework to be scalable as your business grows. Adapt to changing business needs and incorporate new data sources and technologies.
(16) Performance Monitoring: Continuously monitor the performance of your analytics processes and systems. - Optimize for speed and efficiency.
(17) Training and Skill Development: For your analytics team, provide regular training and skill development. Keep up with the most recent trends and innovations in your field.
(18) Stakeholder Communication: Regularly communicate findings and insights to stakeholders. - Encourage feedback and collaboration in decision-making processes.
(19) Review and Audit: Periodically review the effectiveness of your tech business analytics methodology. - Conduct audits to ensure data accuracy and compliance.
(20) ROI Assessment: Measure the return on investment (ROI) of your analytics initiatives to justify resources and investments.
By employing this methodology, the IT company in the service sector may use data analytics to make wise decisions, enhance client experiences, and promote sustainable growth.

6. CONCEPT OF TECH-BUSINESS ANALYTICS IN TERTIARY INDUSTRY SECTOR :

The tertiary sector, often known as the service industry, uses tech-business analytics to streamline operations, enhance customer experiences, and spur corporate expansion. The tertiary sector includes a wide range of service-based industries, such as finance, healthcare, education, hospitality, entertainment, and more. An summary of the idea is provided below:
(1) Data Collection and Integration: Gather data from various sources within the service industry, such as customer interactions, transactions, online behavior, and operational processes. Integrate data from disparate sources to create a unified dataset.
(2) Customer Insights: Analyze customer data to gain insights into preferences, behavior, and satisfaction levels. Use segmentation and profiling to tailor services and marketing efforts.
(3) Operational Efficiency: Utilize analytics to optimize internal processes, reduce costs, and enhance resource allocation. Predictive maintenance can be applied to industries with physical infrastructure, like utilities or transportation.

(4) Personalization and Customer Experience: Implement personalization strategies to offer tailored services and recommendations. Improve customer experiences through data-driven insights, leading to higher satisfaction and loyalty.
(5) Fraud Detection and Security: Use analytics to detect fraudulent activities and enhance security measures. In financial services, for instance, anomaly detection algorithms can identify unusual transactions.
(6) Resource Allocation and Demand Forecasting: Forecast demand patterns to optimize staffing, inventory, and resource allocation. Adjust services based on predicted demand fluctuations.
(7) Healthcare Analytics: In the healthcare sector, analyze patient data for better diagnosis, treatment, and resource management. Predict disease outbreaks and healthcare trends.
(8) Financial Services: Analyze financial data to assess risk, develop investment strategies, and detect financial fraud. Improve customer service through personalized financial advice.
(9) Education Sector: Use analytics to assess student performance, optimize course offerings, and predict enrollment trends. Enhance e-learning experiences through data-driven content recommendations.
(10) Entertainment and Media: Analyze viewership and engagement data to create targeted content and advertising. - Improve content recommendations for streaming platforms.
(11) Hospitality and Tourism: Use analytics to personalize guest experiences, optimize pricing, and manage bookings efficiently. Predict travel trends to adapt marketing strategies.
(12) Legal and Consulting Services: Utilize data analytics for case prediction, contract analysis, and legal research. Enhance consulting services by providing data-driven insights to clients.
(13) Regulatory Compliance: Ensure compliance with industry regulations, such as HIPAA in healthcare or GDPR in data privacy. Use analytics to monitor and report on compliance efforts.
(14) Technology Stack: Invest in technology infrastructure, including data warehouses, analytics tools, and cybersecurity measures.
(15) Continuous Improvement: Establish a culture of continuous improvement based on data-driven insights. - Adapt strategies and services in response to changing market dynamics.
(16) Collaboration: Foster collaboration between data analysts, domain experts, and IT teams to harness the full potential of analytics.
(17) Data Privacy and Ethics: Ensure the responsible use of data, respecting privacy and ethical guidelines.
Businesses in the tertiary sector may make better decisions, improve customer experiences, streamline operations, and remain competitive in a fast changing environment with the help of tech-business analytics. Organizations in this industry must adopt data-driven strategies and use technology to succeed in the digital world.

7. MODEL OF TECH-BUSINESS ANALYTICS AND ITS APPLICATION IN TERTIARY INDUSTRY SECTOR :

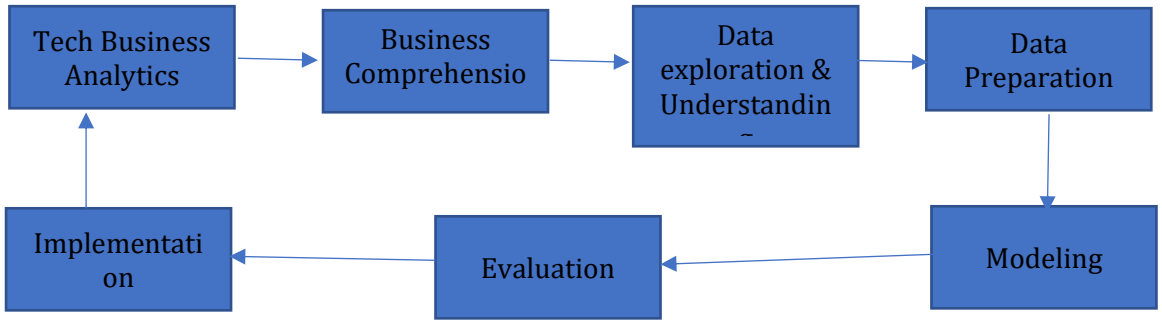

Fig. 1: TBA Model in Tertiary Industry Sector

Several tech-business analytics models are applicable in the tertiary industrial sector. One such technique is the CRISP-DM model, often known as the "Cross-Industry Standard Process for Data Mining," (figure 1) which contains the steps detailed below:
Business comprehension: During this phase, the business opportunity or problem is located, and the analysis's objectives are specified. Recognising the important stakeholders and comprehending the business context are required.

Data exploration and understanding: At this stage, the data sources are determined and the data is gathered. Understanding the data's structure and quality, spotting any gaps in the data or outliers, and getting the data ready for analysis are all necessary steps in this process.
Data Preparation: To get the data ready for analysis, it must first be transformed and pre-processed. Data cleaning, noise and redundancy reduction, and variable selection are required for this.
Modelling: Various modelling approaches are applied to the data at this step in order to find trends, connections, and new information. Techniques like neural networks, cluster analysis, or regression analysis may be used for this.
Evaluation: Using the model's success in achieving the set objectives, the effectiveness of the model is assessed at this step. In doing so, it's important to evaluate the model's precision, dependability, and robustness as well as any potential for development.
Implementation: The model is implemented and integrated into the operational procedures during this step. Creating an implementation strategy and keeping track of the model's performance over time are required.

7.1 Integration of BA with ICCT Underlying Technologies in Service Industry:

The integration of Business Analysis (BA) with Integrated Customer Communication Technologies (ICCT) in the service industry can lead to improved customer experiences, streamlined operations, and better decision-making. Here's how these two areas can be integrated using underlying technologies:

Table 16: Integration of BA with ICCT Underlying Technologies in Service Industry

S. No.	Aspects	Description
1.	**Data Analytics and Business Intelligence (BI)**	Use data analytics tools to gather insights from customer interactions facilitated by ICCT systems. BA professionals can analyze this data to identify trends, customer preferences, and areas for improvement in service delivery. BI dashboards can be created to provide real-time updates on customer communication patterns, service requests, and performance metrics. This helps businesses make data-driven decisions.
2.	**Process Automation**	Integrate ICCT with workflow automation tools. When BA professionals identify bottlenecks or inefficiencies in service processes, automation can help streamline these processes. For example, chatbots and automated response systems can address common consumer questions, freeing up human employees to handle more complicated situations.
3.	**Customer Journey Mapping**	Collaborate between BA and ICCT teams to create detailed customer journey maps. This helps in understanding how customers interact with the service at various touchpoints. Identify pain points and opportunities for enhancing the customer experience. The ICCT systems can then be tailored to address these findings.
4.	**CRM Integration**	Integrate ICCT systems with Customer Relationship Management (CRM) software. This enables a 360-degree view of each customer, their interactions, and preferences. BA professionals can use this data to personalize services, improve customer retention, and upsell/cross-sell effectively.
5.	**Machine Learning and AI**	Implement machine learning and AI algorithms to predict customer behavior. BA can work with data scientists to build models that forecast customer needs, churn risk, or service demand. ICCT systems can then use these predictions to proactively engage with customers.
6.	**Feedback Loops**	Establish feedback loops where insights gathered from BA efforts are used to enhance ICCT systems. For example, if BA identifies common customer complaints, ICCT systems can be adjusted to address these issues more effectively.

7.	**Security and Compliance**	Collaborate on ensuring that ICCT systems adhere to industry regulations and security standards. BA professionals can identify compliance gaps and work with IT teams to address them.
8.	**User Experience (UX) Design**	BA can provide input into the design of ICCT interfaces and user experiences. This ensures that the systems are user-friendly and align with the needs of both customers and employees.
9.	**Change Management**	Collaborate on change management strategies when implementing new ICCT technologies. BA can help identify potential resistance points and develop strategies to ensure a smooth transition.
10.	**Continuous Improvement**	By routinely reviewing and analyzing data from ICCT systems, you may promote a culture of continuous improvement. Identifying opportunities for improvement and innovation can be greatly aided by BA.

In conclusion, the integration of BA with ICCT technologies in the service industry can lead to more efficient operations, improved customer satisfaction, and better strategic decision-making. This collaboration ensures that technology investments align with business goals and customer needs.

7.2 Integration of BA with AI & Robotics Technologies in Service Industry

Integrating Business Analysis (BA) with Artificial Intelligence (AI) and Robotics Technologies in the service industry can lead to increased efficiency, cost savings, and enhanced customer experiences. Here's how these areas can be integrated:

Table 17: Integration of BA with AI & Robotics Technologies in Service Industry

S. No.	Aspects	Description
1.	**Data-Driven Insights**	BA professionals can work with data scientists to leverage AI algorithms for analyzing large volumes of customer data. This can help identify patterns, trends, and customer preferences that inform business strategies.
2.	**Predictive Analytics**	Utilize AI and machine learning to predict customer behavior, service demand, and potential issues. BA can use these predictions to develop proactive strategies and improve decision-making.
3.	**Chatbots and Virtual Assistants**	Collaborate on the development and deployment of AI-powered chatbots and virtual assistants for customer support. BA can help design conversational flows that align with customer needs and service goals.
4.	**Robotic Process Automation (RPA)**	Identify repetitive and rule-based tasks within service processes, and integrate RPA to automate them. BA can help select suitable processes for automation and ensure they align with business objectives.
5.	**Natural Language Processing (NLP)**	Incorporate NLP technologies into customer service chatbots and AI systems to enable more natural and efficient interactions with customers. BA can define the language and tone used in these interactions.
6.	**Personalization**	Collaborate to create AI-driven personalization strategies. BA can identify the data points and customer insights necessary for tailoring services and content to individual preferences.
7.	**Quality Assurance and Compliance**	Work together to ensure that AI and robotic systems adhere to quality standards and regulatory requirements. BA can identify areas where human oversight is essential to maintain service quality and compliance.
8.	**Continuous Improvement**	Establish feedback loops to monitor the performance of AI and robotic systems. BA can analyze feedback and data to make continuous improvements, enhancing the customer experience and operational efficiency.

9.	**Change Management**	Develop change management strategies to ensure a smooth transition when implementing AI and robotics technologies. BA can identify potential resistance points and design strategies to address them.
10.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of AI and robotic implementations. BA can assess the ROI of these technologies by measuring their impact on efficiency, cost reduction, and customer satisfaction.
11.	**User Experience (UX) Design**	Collaborate on the design of AI-powered interfaces and interactions to ensure they are user-friendly and align with the service industry's goals and customer expectations.
12.	**Training and Skill Development**	BA can identify the skills and training needed for employees to work effectively alongside AI and robotic systems. This ensures that the workforce can adapt to new technologies.
13.	**Ethical Considerations**	Address ethical concerns related to AI and robotics, such as data privacy, bias, and job displacement. BA can help formulate ethical guidelines and policies that align with industry best practices.

By integrating BA with AI and Robotics Technologies in the service industry, organizations can leverage data-driven insights, automation, and enhanced customer interactions to deliver more efficient and personalized services, ultimately leading to improved customer satisfaction and competitive advantages.

7.3 Integration of BA with Blockchain Technologies in Service Industry

Integrating Business Analysis (BA) with Blockchain technologies in the service industry can bring about several benefits such as increased transparency, security, and efficiency in service delivery. Here's how these two areas can be integrated:

Table 18: Integration of BA with Blockchain Technologies in Service Industry

S. No.	Aspects	Description
1.	**Supply Chain Management**	Use Blockchain to create transparent and immutable records of goods and services throughout the supply chain. BA professionals can analyze this data to identify bottlenecks, optimize processes, and enhance the overall supply chain efficiency.
2.	**Smart Contracts**	Implement smart contracts for service agreements and payments. BA can help design these contracts to ensure they accurately capture the terms and conditions of services and automate payment processes when predefined conditions are met.
3.	**Identity Verification**	Develop blockchain-based identity verification systems for customers and employees. BA can ensure that these systems meet regulatory requirements and enhance security and privacy.
4.	**Data Security and Privacy**	Use blockchain for secure data storage and access control. BA can analyze data management processes to ensure compliance with data protection regulations and identify areas for improvement.
5.	**Fraud Detection and Prevention**	Leverage blockchain's transparency to detect and prevent fraud in service transactions. BA professionals can design algorithms and rules to flag suspicious activities and analyze patterns of fraudulent behavior.
6.	**Decentralized Autonomous Organizations (DAOs)**	Explore the potential of DAOs in service industry governance and decision-making. BA can help design governance structures and processes that leverage blockchain's transparency and security.
7.	**Auditing and Compliance**	Use blockchain for real-time auditing and compliance monitoring. BA can work to ensure that blockchain systems capture all relevant data for auditing purposes and help design compliance protocols.
8.	**Tokenization of Assets**	Tokenize service assets or offerings on the blockchain. BA can analyze the implications of tokenization on business models, pricing strategies, and customer engagement.

9.	**Customer Loyalty Programs**	Implement blockchain-based customer loyalty programs to enhance customer retention. BA can design loyalty program structures and analyze the impact on customer behavior.
10.	**Cross-Border Transactions**	Facilitate cross-border transactions and payments using blockchain technology. BA can help identify the regulatory and compliance challenges and design strategies to address them.
11.	**Smart Asset Management**	Use blockchain for tracking and managing service assets efficiently. BA can analyze asset utilization data to optimize maintenance schedules and reduce downtime.
12.	**User Experience (UX) and Interface Design**	Collaborate on designing user-friendly blockchain interfaces for both customers and employees. BA can ensure that blockchain interactions are intuitive and aligned with service industry goals.
13.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of blockchain implementations, considering factors such as reduced fraud, improved efficiency, and enhanced security. BA can assess the ROI of blockchain adoption.
14.	**Change Management**	Develop change management strategies to facilitate the transition to blockchain-based systems. BA can identify potential resistance points and design strategies to address them.

Integrating BA with Blockchain technologies in the service industry can revolutionize service delivery by enhancing security, transparency, and efficiency. By leveraging blockchain's capabilities, businesses can create trust in their services and gain a competitive edge in the marketplace.

7.4 Integration of BA with Cloud Computing Technologies in Service Industry:

Integrating Business Analysis (BA) with Cloud Computing Technologies in the service industry can lead to increased scalability, flexibility, and cost-efficiency in service delivery. Here's how these two areas can be integrated:

Table 19: Integration of BA with Cloud Computing Technologies in Service Industry

S. No.	Aspects	Description
1.	**Data Analytics and Business Intelligence (BI)**	Utilize cloud-based data analytics and BI tools to gather insights from customer interactions and service data. BA professionals can analyze this data to identify trends, customer preferences, and areas for improvement in service delivery.
2.	**Scalable Infrastructure**	Leverage cloud infrastructure for scalable service delivery. BA can work with IT teams to determine the optimal cloud resources required to meet service demands, reducing the need for large upfront investments in physical hardware.
3.	**Recovery from disasters and business continuity**	Take use of cloud-based backup and disaster recovery tools. In order to lower the risk of downtime and data loss, BA can make sure that service processes have reliable disaster recovery plans in place.
4.	**Remote Work and Collaboration**	Facilitate remote work and collaboration through cloud-based productivity tools and platforms. BA can assess the impact of remote work on service operations and suggest improvements.
5.	**Cost Management**	Monitor and optimize cloud costs. BA professionals can analyze cloud spending patterns, identify cost-saving opportunities, and recommend adjustments to cloud resources and services.
6.	**Service Deployment and Testing**	Use cloud environments for service testing and deployment. BA can work with development teams to ensure that new services and updates are thoroughly tested in cloud environments before deployment.

7.	**Security and Compliance**	Collaborate to ensure that cloud-based services adhere to security standards and regulatory requirements. BA can identify compliance gaps and work with IT teams to address them.
8.	**Data Integration**	Integrate cloud-based data storage and data integration services to streamline access to critical data. BA can help design data integration strategies that ensure data consistency and availability across the organization.
9.	**User Experience (UX) and Accessibility**	Collaborate on designing user-friendly cloud-based interfaces and experiences for both customers and employees. BA can ensure that cloud interactions are intuitive and aligned with service industry goals.
10.	**Change Management**	Develop change management strategies to ensure a smooth transition when adopting cloud technologies. BA can identify potential resistance points and design strategies to address them.
11.	**Service Scalability**	Assess the scalability of cloud-based services and infrastructure to meet changing customer demands. BA can work with IT teams to develop strategies for scaling resources up or down as needed.
12.	**Vendor Evaluation and Selection**	Assist in the evaluation and selection of cloud service providers. BA can help identify the cloud providers that best align with the service industry's specific needs and goals.
13.	**Compliance Monitoring**	Use cloud-based tools for monitoring and auditing compliance with industry regulations and internal policies. BA can ensure that cloud services provide the necessary features and controls for compliance.
14.	**Performance Monitoring and Optimization**	Monitor the performance of cloud-based services and recommend optimizations as needed. BA can analyze performance metrics and suggest improvements to enhance service quality.

Integrating BA with Cloud Computing Technologies in the service industry enables organizations to leverage the scalability, cost-efficiency, and flexibility of the cloud while ensuring that services are aligned with business goals and customer expectations. This integration can lead to improved service delivery and customer satisfaction.

7.5 Integration of BA with Cyber Security Technologies in Service Industry:

Integrating Business Analysis (BA) with Cybersecurity Technologies in the service industry is essential for safeguarding sensitive data, maintaining trust with customers, and ensuring the continuity of services. Table 20 illustrates how these two areas can be integrated:

Table 20: Integration of BA with Cyber Security Technologies in Service Industry

S. No.	Aspects	Description
1.	**Risk Assessment**	Collaborate to assess cybersecurity risks associated with service operations. BA can help identify potential vulnerabilities in processes and systems, allowing cybersecurity experts to prioritize their efforts.
2.	**Data Classification and Protection**	Work together to classify data by its sensitivity level. BA can define data handling procedures, and cybersecurity experts can implement the necessary protective measures, such as encryption and access controls.
3.	**Planned Response to Incidents**	In partnership with BA, create and test incident response plans. By assisting with the definition of protocols for recognizing and reporting security events, BA can ensure a coordinated response to minimize service interruptions.
4.	**Security by Design**	Integrate security into the design of new services and systems. BA can ensure that security considerations are included in the requirements and that security controls are part of the development process.

5.	**User Authentication and Access Control**	Collaborate on user authentication and access control mechanisms for services. BA can define user roles and access requirements, while cybersecurity experts implement secure authentication and authorization systems.
6.	**Security Awareness Training**	Implement security awareness programs for employees. BA can help design training materials, and cybersecurity experts can deliver training sessions and assess the effectiveness of the training.
7.	**Vulnerability Management**	Work together to identify and address vulnerabilities in service systems. BA can assist in the prioritization of vulnerabilities based on business impact, while cybersecurity experts can execute remediation efforts.
8.	**Compliance and Regulatory Alignment**	Collaborate to ensure that services meet regulatory and compliance requirements related to cybersecurity. BA can identify compliance gaps, and cybersecurity experts can implement the necessary controls and documentation.
9.	**Security Auditing and Testing**	Conduct security audits and penetration testing of service systems. BA can ensure that testing aligns with business goals and that identified vulnerabilities are addressed promptly.
10.	**Data Privacy and GDPR Compliance**	Ensure compliance with data privacy regulations, such as GDPR. BA can help identify personal data usage within services, while cybersecurity experts can implement the necessary controls for data protection.
11.	**Threat Intelligence and Monitoring**	Collaborate on the collection and analysis of threat intelligence. BA can assess the business impact of emerging threats, while cybersecurity experts monitor and respond to threats in real-time.
12.	**Security Incident Reporting and Documentation**	Define procedures for reporting and documenting security incidents. BA can assist in creating incident reporting templates and workflows, ensuring thorough documentation for future analysis and reporting to authorities if required.
13.	**Key Performance Indicators (KPIs) for Security**	Create security KPIs and metrics to assess the performance of security measures. The BA can specify the business goals related to security, and cybersecurity professionals can offer the information and analysis.
14.	**Continual Improvement**	Foster a culture of continual improvement in security practices. BA can analyze security incidents and identify opportunities for process enhancements, while cybersecurity experts implement necessary changes.

By integrating BA with Cybersecurity Technologies in the service industry, organizations can proactively identify and address security risks, protect sensitive data, and ensure the reliability of their services. This collaboration is crucial for maintaining customer trust and complying with increasingly stringent data protection regulations.

7.6 Integration of BA with Internet of Things (IoT) Technologies in Service Industry:

Integrating Business Analysis (BA) with Internet of Things (IoT) technologies in the service industry can lead to enhanced service offerings, improved efficiency, and new revenue streams. Table 21 depicts how these two areas can be integrated:

Table 21 : Integration of BA with Internet of Things (IoT) Technologies in Service Industry

S. No.	Aspects	Description
1.	**Identifying Business Goals**	Collaborate to define business goals and objectives related to IoT implementations. BA can help ensure that IoT initiatives align with the organization's broader service strategy.

2.	**Customer Experience Enhancement**	Gain insights into consumer behavior and preferences with IoT data. BA specialists can use this data to analyses potential for improving customer satisfaction and personalizing offerings.
3.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of IoT implementations. BA can assess the ROI of IoT projects, considering factors such as cost savings, revenue generation, and improved service quality.
4.	**Data Integration**	Integrate IoT-generated data with existing business systems and processes. BA can help design data integration strategies to ensure that IoT data is accessible and actionable for decision-making.
5.	**Service Innovation**	Collaborate on the development of new IoT-driven service offerings. BA can identify market needs and business opportunities that IoT technologies can address.
6.	**IoT Device Management**	Work together to define procedures for managing IoT devices and sensors. BA can ensure that device management aligns with business objectives, including scalability and reliability.
7.	**Data Security and Privacy**	Address IoT data security and privacy concerns. BA can help define policies and procedures for securing IoT data and ensuring compliance with data protection regulations.
8.	**Performance Metrics**	Define key performance indicators (KPIs) for IoT initiatives. BA professionals can identify metrics that measure the success of IoT projects and their impact on service delivery.
9.	**Predictive Maintenance**	Leverage IoT data for predictive maintenance of service equipment and assets. BA can assess the business impact of reduced downtime and maintenance costs.
10.	**Process Optimization**	Analyze IoT data to identify areas for process optimization. BA can work with operational teams to streamline processes and improve resource allocation.
11.	**Scalability and Reliability**	Ensure that IoT solutions are scalable and reliable to meet changing service demands. BA can assess the scalability requirements and help plan for future growth.
12.	**Regulatory Compliance**	Collaborate on ensuring that IoT implementations comply with industry regulations and standards. BA can identify compliance gaps and work with IoT teams to address them.
13.	**User Experience (UX) Design**	Design user-friendly interfaces and experiences for IoT-driven services. BA can ensure that IoT interactions are intuitive and align with service industry goals.
14.	**Change Management**	Develop change management strategies to facilitate the adoption of IoT technologies within the organization. BA can identify potential resistance points and design strategies to address them.
15.	**Data Analytics and Machine Learning**	Utilize advanced analytics and machine learning on IoT data to gain deeper insights and predict future trends. BA can work with data scientists to develop models that inform service decisions.

By integrating BA with IoT technologies in the service industry, organizations can unlock the full potential of IoT for improving service quality, reducing costs, and creating innovative offerings that meet the evolving needs of customers. This collaboration ensures that IoT initiatives are aligned with business objectives and customer expectations.

7.7 Integration of BA with 3D Printing Technologies in Service Industry:

Integrating Business Analysis (BA) with 3D Printing Technologies in the service industry can lead to innovative service offerings, improved cost-efficiency, and enhanced customer experiences. Here's how these two areas can be integrated:

Table 22: Integration of BA with 3D Printing Technologies in Service Industry

S. No.	Aspects	Description
1.	**Identifying Business Opportunities**	Collaborate to identify potential business opportunities that 3D printing can offer. BA can conduct market research and analyze customer needs to identify areas where 3D printing can add value.
2.	**Market Analysis**	Conduct market analysis to understand the competitive landscape and demand for 3D-printed products and services. BA can assess market trends and identify target customer segments.
3.	**Cost-Benefit Analysis**	Evaluate the cost-benefit of 3D printing implementations. BA can analyze the ROI of 3D printing projects, considering factors such as material costs, production speed, and service quality.
4.	**Service Design**	Collaborate on designing new services that leverage 3D printing technology. BA can help define service specifications, pricing models, and quality standards.
5.	**Supply Chain Optimization**	Use 3D printing to optimize the supply chain. BA professionals can analyze supply chain processes to identify opportunities for reducing lead times, inventory costs, and transportation expenses.
6.	**Prototyping and Product Development**	Work together on rapid prototyping and product development using 3D printing. BA can gather user feedback and iterate on designs to meet customer expectations.
7.	**Customization and Personalization**	Leverage 3D printing for customized and personalized products and services. BA can identify customer preferences and design experiences that allow for individualized creations.
8.	**Quality Control**	Define quality control processes for 3D-printed products. BA can ensure that quality standards align with service industry requirements and customer expectations.
9.	**Regulatory Compliance**	Collaborate on ensuring that 3D printing implementations comply with industry regulations and standards. BA can identify compliance gaps and work with 3D printing teams to address them.
10.	**Inventory Management**	Analyze the impact of 3D printing on inventory management. BA can work with logistics teams to determine optimal inventory levels and storage solutions.
11.	**Scalability and Resource Planning**	Ensure that 3D printing solutions are scalable to meet increasing demands. BA can assess the scalability requirements and help plan for resource allocation.
12.	**User Experience (UX) Design**	Design user-friendly interfaces and experiences for customers interacting with 3D printing services. BA can ensure that the ordering, customization, and tracking processes are intuitive.
13.	**Change Management**	Develop change management strategies to facilitate the adoption of 3D printing technologies within the organization. BA can identify potential resistance points and design strategies to address them.

14.	**Training and Skill Development**	Identify the skills and training needed for employees to work effectively with 3D printing technology. BA can ensure that the workforce can adapt to and utilize new technologies.
15.	**Data Analytics**	Utilize data analytics to gather insights from 3D printing operations. BA can analyze data to identify trends, customer preferences, and areas for improvement.

Integrating BA with 3D Printing Technologies in the service industry enables organizations to unlock the potential of additive manufacturing for creating customized products, streamlining supply chains, and improving cost-efficiency. This collaboration ensures that 3D printing initiatives are aligned with business objectives and customer needs.

7.8 Integration of BA with Mobile Communication & Marketing Technologies in Service Industry:

Integrating Business Analysis (BA) with Mobile Communication and Marketing Technologies in the service industry can lead to more effective customer engagement, targeted marketing campaigns, and improved service delivery. Table 23 depicts how these two areas can be integrated:

Table 23: Integration of BA with Mobile Communication & Marketing Technologies in Service Industry

S. No.	Aspects	Description
1.	**Customer Needs Analysis**	Collaborate to understand customer needs and preferences using data from mobile interactions. BA can analyze customer behavior and feedback to identify opportunities for service improvement and personalization.
2.	**Mobile App Development**	Work together on the development of mobile apps that enhance the customer experience. BA can define app requirements and functionalities based on business goals and user needs.
3.	**User Experience (UX) Design**	Design user-friendly mobile interfaces and experiences. BA can ensure that mobile interactions are intuitive and align with the service industry's goals and customer expectations.
4.	**Data Analytics and Personalization**	Utilize data analytics to personalize marketing messages and service offerings. BA professionals can work with marketing teams to create targeted campaigns based on customer profiles and behavior.
5.	**Mobile Payment Solutions**	Integrate secure mobile payment options into service offerings. BA can define payment processes and ensure they align with industry regulations and customer security expectations.
6.	**Location-Based Services**	Leverage location-based technologies for targeted marketing and service promotions. BA can identify opportunities to engage customers based on their geographic location and preferences.
7.	**Cross-Channel Marketing**	Coordinate marketing efforts across various mobile channels (e.g., SMS, email, push notifications). BA can help design integrated marketing strategies that ensure consistent messaging and customer engagement.

8.	**Performance Metrics**	Define key performance indicators (KPIs) for mobile marketing and service initiatives. BA can identify metrics that measure the success of mobile campaigns and their impact on service quality.
9.	**Mobile Content Strategy**	Collaborate on content strategies for mobile communication. BA can help ensure that content aligns with the brand's messaging and customer expectations.
10.	**Data Privacy and Compliance**	Address data privacy and compliance concerns related to mobile marketing and communication. BA can work with legal and compliance teams to ensure that data collection and usage adhere to regulations.
11.	**Testing and quality control for mobile apps**	To ensure that apps are error-free and user-friendly, work together on testing and quality assurance for mobile applications. Testing standards and user acceptance testing (UAT) procedures can be specified by BA.
12.	**Customer Feedback and Surveys**	Collect customer feedback through mobile channels and analyze it for insights. BA can design surveys and feedback mechanisms that provide valuable data for service improvement.
13.	**Cross-Device Compatibility**	Ensure that mobile communication and marketing efforts are compatible with various mobile devices and screen sizes. BA can work with development teams to optimize content and design for different devices.
14.	**Change Management**	Develop change management strategies to facilitate the adoption of mobile communication and marketing technologies within the organization. BA can identify potential resistance points and design strategies to address them.
15.	**Competitive Analysis**	Analyze competitors' mobile strategies and offerings. BA can provide insights on how to differentiate services and gain a competitive edge through mobile technologies.

Integrating BA with Mobile Communication and Marketing Technologies in the service industry can lead to more personalized, efficient, and engaging customer experiences. This collaboration ensures that mobile initiatives align with business objectives, regulatory requirements, and customer expectations.

7.9 Integration of BA with Information Storage Technologies in Service Industry:

Integrating Business Analysis (BA) with Information Storage Technologies in the service industry is crucial for efficient data management, enhanced decision-making, and improved customer experiences. Table 24 depicts how these two areas can be integrated:

Table 24 : Integration of BA with Information Storage Technologies in Service Industry

S. No.	Aspects	Description
1.	**Data Needs Assessment**	Collaborate to assess the data needs of the service industry. BA can work with stakeholders to identify critical data sources, storage requirements, and data access needs.

2.	**Data Governance Framework**	Create a data governance structure including guidelines for data ownership, data quality requirements, and data security measures. With BA, data governance will be in line with corporate goals and legal standards.
3.	**Data Storage and Infrastructure Selection**	Work together to select appropriate data storage technologies, such as databases, data lakes, or cloud storage solutions. BA can analyze business needs and scalability requirements to inform technology choices.
4.	**Data Integration and ETL Processes**	Integrate data storage technologies with other systems and processes. BA can define data integration requirements and design efficient Extract, Transform, Load (ETL) processes.
5.	**Data Security and Access Control**	Collaborate on data security and access control mechanisms. BA can define user roles and access requirements, while IT and security teams implement secure data storage and access protocols.
6.	**Data Backup and Recovery**	Define data backup and recovery strategies to ensure data resilience. BA can help assess business continuity requirements and recommend data recovery mechanisms.
7.	**Scalability and Performance Optimization**	Ensure that data storage solutions are scalable to accommodate growing data volumes. BA can work with IT teams to optimize database performance and storage infrastructure.
8.	**Data Retention Policies**	Collaborate on data retention policies to determine how long data should be stored and when it should be archived or deleted. BA can align data retention with regulatory requirements.
9.	**Business Intelligence and Analytics**	Utilize stored data for business intelligence and analytics. BA can work with data scientists and analysts to define analytical requirements and key performance indicators (KPIs).
10.	**Data Quality Assessment**	Define data quality standards and assessment processes. BA can help identify data quality issues and recommend data cleansing and validation procedures.
11.	**Compliance and Regulatory Alignment**	Collaborate to ensure that data storage and management comply with industry regulations and standards, such as GDPR or HIPAA. BA can identify compliance gaps and work with compliance teams to address them.
12.	**Data Migration**	Plan and execute data migration projects when transitioning to new storage technologies. BA can ensure that data migration aligns with business goals and data integrity.
13.	**Emergency Preparedness Planning**	Make data storage technology recovery plans for emergencies. The BA can collaborate with the IT teams to define the RTOs and RPOs (recovery point goals).
14.	**Change Management**	Develop change management strategies to facilitate the adoption of new data storage technologies and processes within the organization. BA can identify potential resistance points and design strategies to address them.

15.	**Cost Management**	Monitor and optimize data storage costs. BA professionals can analyze data storage spending patterns, identify cost-saving opportunities, and recommend adjustments to storage resources and services.

Integrating BA with Information Storage Technologies in the service industry ensures that data is effectively managed, secured, and leveraged to support business objectives, analytics, and customer experiences. This collaboration enhances data-driven decision-making and contributes to overall operational efficiency.

7.10 Integration of BA with Ubiquitous Education Technologies in Service Industry:

Integrating Business Analysis (BA) with Ubiquitous Education Technologies in the service industry is crucial for providing effective training, enhancing employee skills, and improving overall service quality. Table 25 depicts how these two areas can be integrated:

Table 25: Integration of BA with Ubiquitous Education Technologies in Service Industry

S. No.	Aspects	Description
1.	**Training Needs Analysis**	Collaborate to identify training needs within the service industry. BA can assess skill gaps, compliance requirements, and emerging trends to inform the development of training programs.
2.	**Learner Analytics**	Utilize data analytics to gather insights from ubiquitous education technologies. BA professionals can analyze learner data to measure training effectiveness and identify areas for improvement.
3.	**Content Development**	Work together on the development of training content. BA can define content requirements, learning objectives, and key performance indicators (KPIs) for measuring the impact of training.
4.	**User Experience (UX) Design**	Design user-friendly interfaces and experiences for ubiquitous education platforms. BA can ensure that the learning experience is engaging and aligned with industry goals.
5.	**Technology Selection**	Choose the best mobile learning apps, virtual reality (VR), augmented reality (AR), or learning management systems (LMS) combined. BA may evaluate the particular needs of the service sector in order to select the optimum technology.
6.	**Gamification and Interactive Learning**	Explore gamification and interactive learning techniques to engage learners. BA can help design gamified learning experiences that motivate employees to participate actively in training.
7.	**Assessment and Certification**	Define assessment criteria and certification processes for training programs. BA can ensure that assessments align with learning objectives and are meaningful for career development.
8.	**Scalability and Accessibility**	Ensure that ubiquitous education technologies are scalable and accessible to a diverse workforce. BA can assess scalability requirements and accessibility standards.

9.	**Learning Pathways**	Collaborate to design personalized learning pathways for employees. BA can help define career progression goals and recommend learning paths that align with service industry roles.
10.	**Feedback Mechanisms**	Implement feedback mechanisms for learners to provide input on training content and effectiveness. BA can analyze feedback data to make continuous improvements to training programs.
11.	**Compliance and Regulatory Training**	Ensure that training programs address compliance and regulatory requirements specific to the service industry. BA can identify compliance gaps and recommend training modules.
12.	**Change Management**	Develop change management strategies to facilitate the adoption of new education technologies within the organization. BA can identify potential resistance points and design strategies to address them.
13.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of education technology implementations. BA can assess the ROI of training initiatives, considering factors such as improved service quality and employee retention.
14.	**Skills Gap Analysis**	Collaborate on skills gap analyses to identify areas where additional training is needed to meet evolving service industry demands. BA can help align training programs with identified skill gaps.
15.	**Data Security and Privacy**	In respect to educational technology, identify and address privacy and data security risks. In order to guarantee student data protection and compliance with privacy rules, BA can work with IT and security teams.

Integrating BA with Ubiquitous Education Technologies in the service industry ensures that training programs are effective, aligned with business goals, and capable of improving service quality. This collaboration also fosters a culture of continuous learning and skill development among employees.

7.11 Integration of BA with Virtual & Augmented Reality Technologies in Service Industry:

Integrating Business Analysis (BA) with Virtual and Augmented Reality (VR/AR) technologies in the service industry can lead to enhanced customer experiences, improved training, and innovative service offerings. Table 26 depicts how these two areas can be integrated:

Table 26: Integration of BA with Virtual & Augmented Reality Technologies in Service Industry

S. No.	Aspects	Description
1.	**Needs Assessment**	Collaborate to assess the needs of the service industry that can benefit from VR/AR technology. BA can identify areas such as employee training, customer engagement, or product visualization where VR/AR can add value.
2.	**Commercial Impact Analysis**	Examine the potential effects of VR and AR implementation on business. BA specialists may evaluate the ROI of VR/AR initiatives by taking into account things like cost reductions, enhanced service quality, and customer pleasure.

3.	**User Experience (UX) Design**	Work together to design user-friendly VR/AR interfaces and experiences. BA can ensure that VR/AR interactions align with service industry goals and customer expectations.
4.	**Content Development**	Collaborate on the development of VR/AR content, such as training modules or product simulations. BA can define content requirements, learning objectives, and key performance indicators (KPIs) for measuring the impact of VR/AR content.
5.	**Technology Selection**	Help select appropriate VR/AR hardware and software solutions. BA can analyze the specific needs of the service industry to make informed technology choices.
6.	**Training and Simulation**	Utilize VR/AR for training and simulations. BA can work with training experts to design immersive training scenarios that replicate real-world service situations.
7.	**Product Visualization**	Implement VR/AR for product visualization and customization. BA can help define product presentation requirements and tailor VR/AR experiences to showcase services or products effectively.
8.	**Customer Engagement**	Explore VR/AR applications for enhancing customer engagement and interaction. BA can identify opportunities for creating immersive customer experiences that align with service goals.
9.	**Feedback Mechanisms**	Implement feedback mechanisms within VR/AR experiences to gather user input on content and usability. BA can analyze feedback data to make continuous improvements.
10.	**Accessibility and Inclusivity**	Ensure that VR/AR solutions are accessible and inclusive to a diverse audience. BA can assess accessibility requirements and compliance with relevant standards.
11.	**Security and Privacy**	Address security and privacy concerns related to VR/AR technologies. BA can work with IT and security teams to ensure that user data within VR/AR experiences is protected and compliant with privacy regulations.
12.	**Change Management**	Develop change management strategies to facilitate the adoption of VR/AR technologies within the organization. BA can identify potential resistance points and design strategies to address them.
13.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of VR/AR implementations. BA can assess the ROI of VR/AR initiatives, considering factors such as improved service quality, reduced training costs, and enhanced customer engagement.
14.	**Data Analytics and Reporting**	Utilize data analytics to gather insights from VR/AR interactions. BA can analyze user behavior, performance metrics, and feedback data to inform decision-making and content improvements.
15.	**Regulatory Compliance**	Collaborate to ensure that VR/AR implementations comply with industry regulations and standards. BA can identify compliance gaps and work with compliance teams to address them.

Integrating BA with Virtual and Augmented Reality Technologies in the service industry ensures that VR/AR initiatives are strategically aligned with business objectives, customer needs, and regulatory requirements. This collaboration enhances service delivery, training effectiveness, and customer engagement through immersive experiences.

7.12 Integration of BA with Quantum Computing Technologies in Service Industry:

Integrating Business Analysis (BA) with Quantum Computing Technologies in the service industry can potentially revolutionize various aspects of service delivery, including data analysis, optimization, and security. While quantum computing is still in its early stages, it's important to understand how it may impact the service industry in the future. Table 27 depicts how BA can be integrated with quantum computing technologies:

Table 27: Integration of BA with Quantum Computing Technologies in Service Industry

S. No.	Aspects	Description
1.	**Identification of Quantum Opportunities**	Collaborate to identify areas within the service industry where quantum computing can bring significant advantages. BA can assess business processes and data challenges that quantum computing might address.
2.	**Business Case Development**	Work together to develop business cases for quantum computing projects. BA can help quantify the potential benefits, including improved efficiency, faster data analysis, and cost savings.
3.	**Data Analysis and Optimization**	Leverage quantum computing for complex data analysis and optimization problems. BA can identify specific data analysis challenges and optimization tasks where quantum algorithms can provide advantages.
4.	**Algorithm Development**	Collaborate on the development of quantum algorithms tailored to service industry needs. BA can work with quantum scientists and programmers to design algorithms that address specific business objectives.
5.	**Security Enhancement**	Utilize quantum computing for advanced encryption and decryption methods to enhance data security. BA can assess security requirements and help implement quantum-safe encryption solutions.
6.	**Supply Chain and Logistics Optimization**	Explore quantum computing's potential for optimizing supply chain and logistics operations. BA can analyze supply chain processes and identify areas where quantum computing can improve efficiency.
7.	**Customer Insights and Personalization**	Utilize quantum computing to process large datasets and extract valuable customer insights. BA can work with data scientists to design algorithms that enable personalized service recommendations and marketing strategies.
8.	**Risk Analysis and Portfolio Optimization**	Collaborate on using quantum computing for risk analysis and portfolio optimization in financial services. BA can identify risk management challenges and design quantum algorithms to address them.
9.	**Healthcare and Drug Discovery**	Explore quantum computing's role in healthcare services, including drug discovery and disease modeling. BA can assess healthcare-related challenges that quantum computing can help solve.

10.	**Energy and Resource Optimization**	Leverage quantum computing to optimize energy consumption and resource allocation in service industries with substantial energy needs. BA can identify opportunities for quantum-enhanced resource management.
11.	**Regulatory Compliance**	Collaborate on ensuring that quantum computing implementations comply with industry regulations and standards. BA can identify compliance requirements related to quantum technologies.
12.	**Change Management**	Develop change management strategies to facilitate the adoption of quantum computing within the organization. BA can help address potential resistance points and ensure a smooth transition.
13.	**Cost-Benefit Analysis**	Conduct cost-benefit analyses of quantum computing implementations. BA can assess the ROI of quantum projects, considering factors such as improved performance and competitive advantages.
14.	**Data Integration**	Integrate quantum computing results with existing data analysis processes. BA can design data integration strategies to ensure that quantum-generated insights are incorporated into decision-making.
15.	**Education and Skill Development**	Identify the skills and training needed for employees to work effectively with quantum computing technology. BA can ensure that the workforce is prepared for quantum advancements.

While quantum computing is still emerging, it holds the potential to transform the service industry by solving complex problems more efficiently than classical computers. Collaborating with BA professionals will help ensure that quantum computing initiatives are aligned with business objectives and challenges.

8. ABCD ANALYSIS FRAMEWORK ON TECH-BUSINESS ANALYTICS IN TERTIARY INDUSTRY SECTOR FROM STAKEHOLDERS POINT OF VIEW :

8.1 ABCD ANALYSIS OF TBA IN SERVICE INDUSTRY AS FROM SUPPLIER POINT OF VIEW:

The ABCD analysis framework serves as a comprehensive method for evaluating diverse entities, be it systems, technologies, materials, strategies, products, or services. Its acronym encompasses four key dimensions: Advantages, Benefits, Constraints, and Disadvantages. This analytical tool systematically dissects the subject under consideration, examining its strengths (Advantages) and the positive outcomes it offers (Benefits), while also identifying limitations or barriers (Constraints) and potential drawbacks (Disadvantages). Through this structured approach, the ABCD analysis provides a holistic assessment, enabling a nuanced understanding of the entity being evaluated, aiding in decision-making, strategy formulation, or assessing potential implementations or innovations. ABCD analysis is made in four forms as (i) ABCD listing, (2) ABCD stakeholder analysis, (3) ABCD factor and elemental analysis, and Quantitative ABCD analysis. The simplest form of ABCD analysis called ABCD listed is used for analysis in many scholarly articles [161-206]. The following section contains ABCD listing of Tech-business Analytics in Tertiary industry sector:

8.1.1 Advantages on Tech-business Analytics in Tertiary industry sector from supplier point of view:

In the tertiary industry sector, tech-business analytics has a number of benefits, as listed in table 28:

Table 28: Advantages on Tech-business Analytics in Tertiary industry sector from supplier point of view

S. No.	Aspects	Description
1.	Better ability to make decisions	Tech-business analytics empowers organisations to make data-driven decisions that are founded on analysis and factual insights rather than hunches or speculation. Better decisions are made as a result, and results are enhanced.
2.	Efficiency of operations	Business process inefficiencies can be found using tech-business analytics, which enables organisations to reorganise their processes and cut expenses. Increasing competition and profitability for businesses can be facilitated by this.
3.	Personalised encounters	To give clients a personalised experience, tech-business analytics can be leveraged. Along with higher sales and revenue, this may also result in more devoted and content customers.
4.	Superiority over rivals	Tech-business analytics can give firms a competitive edge by helping them to spot new opportunities and create cutting-edge goods and services.
5.	Control of risk	Cyber threats, fraud, and challenges with regulatory compliance are just a few of the risks that may be identified and mitigated using tech-business analytics.
6.	Enhanced consumer insights	Tech-business analytics can give companies insightful data about customer behaviour and preferences. This can assist firms in creating more successful marketing plans and enhancing the consumer experience.
7.	Innovation	Technology-based business analytics can help companies innovate by spotting emerging patterns and possibilities. This can help firms expand and keep one step ahead of the competition.

Hence, tech-business analytics has a number of advantages for the tertiary industrial sector, enabling businesses to improve customer experiences, streamline processes, and promote innovation and growth.

8.1.2 Benefits on Tech-business Analytics in Tertiary industry sector from supplier point of view:

The Tertiary Industry sector can gain from tech-business analytics in a variety of ways, including the benefits listed in table 29:

Table 29: Benefits on Tech-business Analytics in Tertiary industry sector from supplier point of view

S. No.	Aspects	Description
1.	Increased efficiency and productivity	Tech-business analytics may assist organisations with process optimisation and operational efficiency improvement, which in turn boosts productivity.

2.	Better decision-making	Businesses can benefit from tech-business analytics by getting insights that help them make wise decisions, which leads to better results, lower risks, and higher performance.
3.	Enhanced customer experience	Business can benefit from using tech-business analytics to better understand the preferences and actions of their clients, allowing them to offer more individualised services and boost client happiness.
4.	Improved competitiveness	Tech-business analytics can allow companies to keep ahead of the competition and strengthen their competitive position by offering insights into market trends, customer behaviour, and the competitive environment.
5.	Innovation	Tech-business analytics can help companies find new opportunities and create cutting-edge goods and services, increasing sales and market share.
6.	Risk management	Tech-business analytics can assist organisations in identifying and minimising risks, such as fraud, security threats, and compliance difficulties, therefore decreasing the possibility of unfavourable consequences.
7.	Cost savings	Tech-business analytics can help companies cut expenses and increase profitability by discovering inefficient and wasteful areas.

Because of this, the advantages of tech-business analytics in the Tertiary industrial sector are substantial, allowing firms to better customer experiences, improve operations, and spur growth and innovation.

8.1.3 Constraints on Tech-business Analytics in Tertiary industry sector from supplier point of view:

There are several benefits to using tech-business analytics in the Tertiary Industrial Sector, but there are also certain difficulties that firms may face, as listed in table 30.

Table 30: Constraints on Tech-business Analytics in Tertiary industry sector from supplier point of view

S. No.	Aspects	Description
1.	Data quality	Accurate and trustworthy data are crucial to tech-business analytics. The analysis's findings can be erroneous or deceptive if the data used is inaccurate, obsolete, or incomplete.
2.	Lack of skilled professionals	Data analysis, statistics, and programming are just a few of the specialised talents needed for tech-business analytics. Businesses may have trouble locating personnel with the appropriate skills to integrate tech-business analytics successfully.
3.	Data privacy and security	Privacy issues may arise from the gathering and processing of customer data. Businesses must ensure that they adhere to data protection rules and regulations, such as the GDPR, and take precautions to secure the data from cyber-attacks.

4.	Cost	Investments in technology, software, and qualified personnel are often necessary for the implementation of tech-business analytics, which can be costly. The expenditures of applying tech-business analytics may be difficult for smaller companies to afford.
5.	Resistance to change	The application of tech-business analytics requires a cultural shift towards data-driven decision-making. Employees who are used to making decisions based on intuition or past experience may be resistant to change.
6.	Complexity:	Tech-business analytics can be challenging and necessitate complex statistical models and advanced algorithms. To make sure that staff can utilise the technology efficiently, businesses may need to spend in training and assistance.

Thus, despite the fact that tech-business analytics has numerous advantages, firms must be aware of these limitations and take action to overcome them if they hope to successfully apply tech-business analytics in the Tertiary industrial sector.

8.1.4 Disadvantages on Tech-business Analytics in Tertiary industry sector from supplier point of view:

Tech-business analytics in the Tertiary industrial sector has some drawbacks, as listed in table 31:

Table 31: Disadvantages on Tech-business Analytics in Tertiary industry sector from supplier point of view

S. No.	Aspects	Description
1.	Dependence on technology	With so much reliance on technology, tech-business analytics can cause operations to be disrupted by system crashes, technical difficulties, or downtime for organisations.
2.	Limited scope	Only the data that is now accessible can be used to generate insights in tech-business analytics. The analysis's conclusions could be constrained if the data are missing pieces or are incomplete.
3.	Human error	The possibility of human error always exists, notwithstanding the accuracy and dependability of tech-business analytics. Erroneous conclusions may stem from improper data entry or a misinterpretation of the results.
4.	Lack of transparency	Businesses may find it challenging to explain how they arrived at particular results since the algorithms employed in tech-business analytics are frequently sophisticated and challenging to comprehend.
5.	Ethical concerns	There may be ethical issues with the gathering and analysis of customer data. Businesses must make sure that the way they use customer data is honest and moral.
6.	Over-reliance on data	While relying too heavily on data can prevent creativity and innovation, it can also provide insightful information. Decision-making that is informed by facts must be balanced with creative and intuitive thinking in business.

Thus, despite the fact that tech-business analytics has many benefits, companies must be aware of these drawbacks and take action to address them if they are to successfully deploy tech-business analytics in the Tertiary industrial sector.

8.2 ABCD Analysis of TBA IN SERVICE INDUSTRY AS producer Points of View:

8.2.1 Advantages on Tech-business Analytics in Tertiary industry sector from producer point of view:

Tech-business analytics in the tertiary industry sector (services sector) can provide several advantages from the producer's point of view. These advantages can help organizations improve their operations, enhance customer experiences, and make data-driven decisions. Table 32 identifies some of the key advantages:

Table 32: Advantages on Tech-business Analytics in Tertiary industry sector from producer point of view

S. No.	Aspects	Description
1.	**Improved Customer Understanding**	Tech-business analytics allow producers to gain deeper insights into customer behavior and preferences. They can analyze customer data to understand buying patterns, demographics, and needs, enabling them to tailor services to individual customers.
2.	**Personalization of Services**	With the insights derived from analytics, producers can personalize their services. They can offer customized recommendations, promotions, and experiences that cater to each customer's specific preferences, increasing customer satisfaction and loyalty.
3.	**Enhanced Marketing and Sales Strategies**	Analytics can help producers refine their marketing and sales strategies. By analyzing data on customer interactions, producers can optimize advertising campaigns, target the right audience, and improve conversion rates.
4.	**Efficient Resource Allocation**	Analytics enable better resource allocation. Producers can use data to allocate staff, time, and resources efficiently, reducing operational costs and improving service quality.
5.	**Predictive Maintenance**	In industries with physical assets, such as hospitality or transportation, analytics can predict when equipment or facilities might fail. Producers can schedule preventive maintenance, reducing downtime and saving on repair costs.
6.	**Inventory Optimization**	For service providers with inventory, analytics can help optimize inventory levels. This ensures that they have the right amount of stock on hand, reducing storage costs and preventing stock outs or overstock situations.
7.	**Fraud Detection and Prevention**	Analytics can identify unusual patterns or anomalies in transactions, helping producers detect and prevent fraud or security breaches, which is especially important in industries like banking and insurance.
8.	**Competitive Advantage**	Utilizing analytics can provide a competitive advantage. Producers can use data insights to stay ahead of market trends, respond quickly to changing customer needs, and outperform competitors.

9.	**Cost Reduction**	Analytics can identify areas where costs can be reduced. This could involve optimizing supply chains, streamlining processes, or automating routine tasks, leading to significant cost savings.
10.	**Real-time Decision Making**	In dynamic service industries like e-commerce or hospitality, real-time analytics enable quick decision-making. Producers can respond to customer inquiries, monitor service quality, and adjust operations on the fly.
11.	**Compliance and Risk Management**	Analytics can help producers monitor compliance with industry regulations and manage risks effectively. They can identify compliance gaps and take proactive measures to mitigate risks.
12.	**Improved Service Quality**	By analyzing customer feedback and service data, producers can continuously improve service quality. This leads to higher customer satisfaction and better reviews, attracting more customers.
13.	**Revenue Growth**	Ultimately, tech-business analytics can drive revenue growth. Through data-driven insights, producers can identify cross-selling and upselling opportunities, expand into new markets, and introduce innovative services that resonate with customers.
14.	**Long-term Strategic Planning**	Analytics aids in long-term strategic planning. Producers can use historical data to make informed decisions about future investments, expansions, and partnerships.

Thus, tech-business analytics in the tertiary industry sector offers a multitude of advantages for producers, ranging from enhanced customer experiences to cost reduction and strategic growth. Leveraging data effectively allows organizations to stay competitive and adapt to the ever-changing demands of the service industry.

8.2.2 Benefits on Tech-business Analytics in Tertiary industry sector from producers points of view:

From the perspective of a producer, tech-business analytics in the tertiary industry sector, which focuses mostly on the delivery of services rather than tangible commodities, offers numerous important advantages. These advantages can improve business operations, client satisfaction, and general results. Table 33 identifies few significant benefits:

Table 33: Benefits on Tech-business Analytics in Tertiary industry sector from producer point of view

S. No.	Aspects	Description
1.	**Data-Driven Decision Making**	Tech-business analytics empower producers to make informed decisions based on data rather than intuition or guesswork. This leads to more accurate strategic planning and resource allocation.
2.	**Enhanced Customer Insights**	Analytics provide deeper insights into customer behavior and preferences. Producers can better understand their target audience, allowing for the customization of services and more effective marketing efforts.
3.	**Improved Customer Satisfaction**	By tailoring services to individual customer needs, producers can increase customer satisfaction and loyalty. Personalized experiences and recommendations contribute to positive customer experiences.

4.	**Cost Optimization**	Analytics help identify inefficiencies in operations and resource allocation. Producers can streamline processes, reduce waste, and optimize staffing, leading to cost savings.
5.	**Risk Mitigation**	Analytics can help producers better evaluate and manage risks. This is especially helpful in fields where risk analysis is essential, including banking and insurance.
6.	**Competitive Advantage**	Utilizing analytics can give producers a competitive edge. They can respond faster to market trends, outperform competitors, and stay agile in a rapidly changing business environment.
7.	**Marketing Effectiveness**	Producers can measure the effectiveness of marketing campaigns and adjust strategies accordingly. This leads to more efficient spending and higher ROI on marketing efforts.
8.	**Revenue Growth**	Through data-driven insights, producers can identify cross-selling and upselling opportunities. This not only boosts revenue but also fosters long-term customer relationships.
9.	**Process Improvement**	Analytics can pinpoint areas of improvement within service delivery processes. Producers can optimize workflows, reduce bottlenecks, and enhance overall service quality.
10.	**Real-Time Monitoring**	In industries like hospitality and e-commerce, real-time analytics enable producers to monitor service quality and customer interactions in real-time. This allows for immediate issue resolution and adjustments to service delivery.
11.	**Fraud Detection**	In sectors such as banking and insurance, analytics can help detect fraudulent activities and security breaches by identifying unusual patterns or anomalies in transactions.
12.	**Data Security**	Analytics can be employed to strengthen data security measures, safeguarding sensitive customer information and business data.
13.	**Compliance Management**	For industries with regulatory requirements, analytics can ensure compliance with industry standards and regulations, reducing the risk of fines and penalties.
14.	**Continuous Improvement**	Producers can use analytics to track and measure performance metrics over time, fostering a culture of continuous improvement and innovation.
15.	**Strategic Planning**	Historical data and predictive analytics aid in long-term strategic planning. Producers can make informed decisions about market expansion, investments, and partnerships.
16.	**Resource Allocation**	Analytics help optimize resource allocation, ensuring that budgets are allocated to initiatives that will yield the greatest return on investment.
17.	**Trend Identification**	Producers can identify emerging industry trends and adapt their services and strategies accordingly to stay ahead of the competition.

Thus, tech-business analytics offer numerous benefits to producers in the tertiary industry sector. These advantages encompass improved decision-making, enhanced customer experiences, cost reduction, risk mitigation, and the ability to remain competitive and responsive to market dynamics.

8.2.3 Constraints on Tech-business Analytics in Tertiary industry sector from producer point of view:

Although tech-business analytics in the tertiary industry sector have many benefits, producers may also confront a number of limitations and difficulties. Table 34 identifies a few of the main restrictions:

Table 34: Constraints on Tech-business Analytics in Tertiary industry sector from producer point of view

S. No.	Aspects	Description
1.	**Data Quality and Availability**	Limited access to high-quality data can hinder effective analytics. Producers may struggle with data that is incomplete, inaccurate, or inconsistent, making it difficult to draw meaningful insights.
2.	**Data Privacy and Security**	Privacy regulations (e.g., GDPR, CCPA) and security concerns can restrict the collection and use of customer data. Compliance with these regulations requires careful handling of personal information, which can be complex and costly.
3.	**Data Integration**	Businesses in the tertiary sector may have a variety of old systems and uncooperative data sources. Because of the potential for data silos, it might be difficult to get a complete picture of operations and customer interactions.
4.	**Lack of Analytical Talent**	There may be a shortage of skilled data analysts, data scientists, and data engineers who can effectively manage and interpret data. Attracting and retaining talent in this competitive field can be a constraint.
5.	**Technological Infrastructure**	Outdated or inadequate technological infrastructure can limit the ability to collect, store, and analyze data efficiently. Upgrading systems to support analytics can be costly and time-consuming.
6.	**Cost of Implementation**	Investing in analytics tools, software, and training can be expensive. Smaller producers may struggle to allocate sufficient resources for analytics initiatives.
7.	**Resistance to Change**	Resistance to adopting analytics-driven decision-making within the organization can be a significant constraint. Employees and management may be reluctant to embrace new processes and technologies.
8.	**Complexity of Analytics**	Advanced analytics techniques like machine learning and predictive modeling can be complex to implement and interpret. Producers may lack the expertise to leverage these technologies effectively.
9.	**Ethical Concerns**	The use of analytics can raise ethical concerns, particularly in industries that handle sensitive information. Producers need to ensure that their analytics practices align with ethical guidelines and societal values.

10.	**Scalability Issues**	As the volume of data grows, scalability becomes a concern. Producers may face challenges in scaling their analytics infrastructure to handle larger datasets and increased processing demands.
11.	**Regulatory Compliance**	The tertiary sector often faces complex and evolving regulatory environments. Ensuring that analytics practices comply with these regulations can be challenging.
12.	**Interpretation and Communication**	Extracting actionable insights from data is one thing; effectively communicating those insights to decision-makers is another challenge. Misinterpretation of data or ineffective communication can lead to poor decision-making.
13.	**Cultural Change**	Transforming an organization's culture to become data-driven can be difficult. Resistance to this cultural shift from employees and leadership can impede progress.
14.	**Overemphasis on Short-Term Goals**	Producers may prioritize short-term goals over long-term strategic planning. This can lead to a focus on immediate results rather than sustained analytics efforts.
15.	**ROI Uncertainty**	Demonstrating a clear return on investment (ROI) for analytics initiatives can be challenging. Producers may struggle to quantify the financial benefits of analytics projects.

Despite these constraints, many producers recognize the value of tech-business analytics and are actively working to overcome these challenges. Effective analytics can provide a competitive advantage and drive business growth in the tertiary industry sector, making it a worthwhile investment despite the obstacles.

8.2.4 Disadvantages on Tech-business Analytics in Tertiary industry sector from producer point of view:

Tech-business analytics in the tertiary industry sector, while advantageous, also come with disadvantages and challenges from the producer's point of view. These disadvantages can affect the adoption and implementation of analytics strategies. Table 35 identifies some key disadvantages:

Table 35: Disadvantages on Tech-business Analytics in Tertiary industry sector from producer point of view

S. No.	Aspects	Description
1.	**Cost of Implementation**	Implementing robust tech-business analytics systems can be expensive. Producers need to invest in data collection, storage, software, and skilled personnel, which may strain budgets.
2.	**Complexity of Data Integration**	The tertiary sector often has diverse data sources and legacy systems. Integrating these disparate data sets into a unified analytics platform can be complex and time-consuming.
3.	**Data Privacy and Security Concerns**	Handling and storing customer data raise privacy and security concerns. Producers must navigate regulatory compliance (e.g., GDPR, HIPAA) and invest in strong security measures to protect sensitive information.

4.	**Data Quality Issues**	Poor data quality, including incomplete or inaccurate data, can lead to flawed insights and decisions. Producers may need to invest in data cleansing and validation processes.
5.	**Skills Gap**	There may be a dearth of qualified data scientists and analysts on the employment market. It could be difficult for producers to recruit and keep people with the requisite skills.
6.	**Resistance to Change**	Implementing analytics-driven decision-making can face resistance within the organization. Employees and management may be hesitant to embrace new processes and technologies.
7.	**Overemphasis on Short-Term Goals**	Producers might prioritize short-term goals over long-term strategic planning. This can result in a focus on immediate results rather than sustained analytics efforts.
8.	**Technological Infrastructure**	Outdated or inadequate IT infrastructure can hinder data collection and analysis efforts. Upgrading systems to support analytics can be costly and time-consuming.
9.	**Scalability Challenges**	As data volume grows, scalability becomes a concern. Producers may face difficulties in scaling their analytics infrastructure to handle larger datasets and increased processing demands
10.	**Misinterpretation of Data**	Misinterpreting data or drawing incorrect conclusions can lead to poor decision-making. Producers must ensure that data is analyzed accurately and insights are correctly interpreted.
11.	**Cultural Change**	Transforming an organization's culture to become data-driven can be challenging. Resistance to this cultural shift from employees and leadership can slow down progress.
12.	**Ethical Concerns**	The use of analytics can raise ethical concerns, especially in industries that handle sensitive information. Producers must ensure that their analytics practices align with ethical guidelines and societal values.
13.	**ROI Uncertainty**	Demonstrating a clear return on investment (ROI) for analytics initiatives can be challenging. Producers may struggle to quantify the financial benefits of analytics projects.
14.	**Regulatory Compliance**	The tertiary sector often faces complex and evolving regulatory environments. Ensuring that analytics practices comply with these regulations can be challenging.
15.	**Data Overload**	Having access to vast amounts of data can lead to data overload, making it difficult to extract actionable insights and prioritize key information.
16.	**Lack of Expertise**	Some producers may lack the expertise to leverage advanced analytics techniques such as machine learning, limiting their ability to derive valuable insights from their data.

Despite these disadvantages, many producers recognize the potential benefits of tech-business analytics and are actively working to overcome these challenges. Over time, as technology evolves

and organizations adapt, some of these disadvantages may be mitigated, making analytics an increasingly valuable tool in the tertiary industry sector.

8.3 ABCD Analysis of Tech Business Analytics IN SERVICE INDUSTRY FROM CONSUMERs Points of view:

8.3.1 Advantages on Tech-business Analytics in Tertiary industry sector from consumer point of view:

From the perspective of the consumer, tech-business analytics in the tertiary industrial sector offer a number of benefits that improve their overall experience and happiness with the services they receive. Several of the main benefits are listed in table 36:

Table 36: Advantages on Tech-business Analytics in Tertiary industry sector from consumer point of view

S. No.	Aspects	Description
1.	**Personalized Services**	Tech-business analytics enable service providers to better understand individual customer preferences and behaviors. This leads to more personalized services and recommendations that cater to each consumer's unique needs and preferences.
2.	**Improved Service Quality**	Analytics help service providers identify areas for improvement within their operations. This often translates into better service quality, shorter waiting times, and more efficient problem resolution.
3.	**Enhanced Customer Support**	Analytics-driven customer support allows for quicker response times and issue resolution. Consumers benefit from faster and more effective assistance when they have questions or encounter problems.
4.	**Tailored Offers and Promotions**	Tech-business analytics enable providers to offer targeted promotions and discounts. Consumers receive offers that are more relevant to their interests and needs, resulting in potential cost savings.
5.	**Convenience and Efficiency**	Consumers can enjoy more convenient and efficient experiences thanks to analytics. For example, e-commerce platforms use analytics to optimize search results, making it easier for consumers to find what they're looking for quickly.
6.	**Faster Service Delivery**	In sectors like transportation and logistics, analytics help optimize routes and schedules, leading to faster and more reliable service delivery. This benefits consumers by reducing delivery times and enhancing reliability.
7.	**Cost Savings**	Consumers can benefit from cost savings indirectly as businesses optimize their operations through analytics. This can lead to lower prices or more competitive pricing in the market.
8.	**Improved Product Recommendations**	In e-commerce and content streaming services, analytics algorithms provide consumers with better product or content recommendations, helping them discover new items or shows that match their interests.

9.	**Transparent Pricing**	Analytics can promote pricing transparency. Consumers can compare prices and make more informed purchasing decisions, leading to a fairer marketplace.
10.	**Predictive Maintenance**	In sectors like utilities and home services, predictive analytics can help providers schedule maintenance and repairs before issues become major problems. This reduces downtime and inconvenience for consumers.
11.	**Shorter Queues and Wait Times**	In sectors such as healthcare and entertainment, analytics can optimize appointment scheduling and queuing systems. Consumers spend less time waiting for services.
12.	**Access to Real-Time Information**	Real-time analytics provide consumers with up-to-date information, such as traffic conditions, stock availability, or flight delays, allowing them to make better-informed decisions.
13.	**Enhanced Customer Feedback**	Analytics enable businesses to collect and analyze customer feedback more effectively. This means that consumer input is used to drive continuous improvements in products and services.
14.	**Data Security and Privacy**	Analytics can help businesses identify and address security threats, protecting consumer data. This enhances consumer confidence in sharing personal information.
15.	**Personal Financial Management**	In the financial sector, consumers can benefit from analytics tools that help them manage their finances more effectively, including budgeting and investment recommendations.
16.	**Improved Healthcare**	Analytics can lead to better healthcare outcomes by enabling personalized treatment plans and predictive disease modeling, ultimately benefiting the health and well-being of consumers.

Thus, tech-business analytics in the tertiary industrial sector improve the customer experience by customizing services, raising the standard of excellence, enhancing ease, and providing cost savings. More client loyalty and satisfaction result from these benefits.

8.3.2 Benefits on Tech-business Analytics in Tertiary industry sector from consumer point of view:

Tech-business analytics in the tertiary industry sector provide several significant benefits from a consumer's point of view. These advantages improve the overall consumer experience, enhance convenience, and offer tailored services. Table 37 gives some key benefits:

Table 37: Benefits on Tech-business Analytics in Tertiary industry sector from consumer point of view

S. No.	Aspects	Description
1.	**Personalized Services**	Tech-business analytics enable service providers to understand individual consumer preferences and behaviors. This leads to more personalized services, recommendations, and offerings that align with the consumer's specific needs and interests.
2.	**Enhanced Customer Experience**	Analytics-driven improvements in service quality and efficiency result in a more enjoyable customer experience. Consumers

		encounter fewer issues, shorter wait times, and smoother interactions when dealing with service providers.
3.	**Convenience**	Analytics help service providers optimize processes, reducing the effort required from consumers. This includes streamlined checkouts, quicker issue resolution, and simplified service access, all of which enhance convenience.
4.	**Tailored Offers and Discounts**	Consumers receive offers and discounts that are more relevant to their preferences and purchasing history. This personalization can lead to cost savings and a higher perceived value of services.
5.	**Faster Responses and Issue Resolution**	Tech-business analytics enable faster response times and more efficient problem-solving. Consumers benefit from quicker customer support and issue resolution, reducing frustration.
6.	**Product and Content Recommendations**	In sectors like e-commerce and entertainment, analytics algorithms provide consumers with personalized product or content recommendations. This helps consumers discover new items or shows that match their interests.
7.	**Transparency**	Pricing and service details become more transparent through analytics. Consumers can easily compare prices, terms, and features, making it easier to make informed decisions.
8.	**Predictive Maintenance**	In sectors like transportation and utilities, predictive analytics can lead to more reliable services. Consumers experience fewer disruptions due to proactive maintenance and repairs.
9.	**Shorter Wait Times**	In healthcare, entertainment, and other sectors with queues, analytics can optimize scheduling and reduce wait times. Consumers spend less time waiting for appointments or services.
10.	**Real-Time Information**	Consumers have access to real-time information, such as traffic updates, stock availability, or service status. This enables them to make timely decisions and adjustments.
11.	**Improved Customer Feedback**	Analytics-driven feedback mechanisms allow consumers to provide input more easily and see their suggestions taken into account. This helps businesses make continuous improvements.
12.	**Data Security and Privacy**	Analytics can enhance data security and privacy practices, reassuring consumers that their personal information is handled responsibly and protected from security threats.
13.	**Personal Financial Management**	In finance, consumers benefit from analytics tools that offer insights into their spending habits, budgeting advice, and investment recommendations, helping them manage their finances more effectively.
14.	**Health and Well-being**	In healthcare, analytics can lead to better health outcomes. Consumers receive personalized treatment plans and early disease detection, contributing to their overall well-being.
15.	**Energy Efficiency**	In utilities, consumers may benefit from reduced energy consumption through analytics-driven suggestions for optimizing energy usage in homes and businesses.
16.	**Transparent Billing**	Consumers receive clearer and more accurate bills, reducing billing disputes and ensuring they only pay for services they've used.

Hence, tech-business analytics in the tertiary industry sector empower consumers with more personalized, efficient, and transparent services. These benefits contribute to a higher level of satisfaction and engagement with service providers.

8.3.3 Constraints on Tech-business Analytics in Tertiary industry sector from consumer point of view:

Consumers in the tertiary industry sector may also encounter constraints and challenges related to tech-business analytics. While these analytics can provide benefits, they can also raise concerns and limitations from the consumer's perspective. Table 38 lists some of key constraints:

Table 38: Constraints on Tech-business Analytics in Tertiary industry sector from consumer point of view

S. No.	Aspects	Description
1.	**Privacy Concerns**	Customers can be concerned about how much of their personal information is gathered, saved, and utilized for analytics. Data breaches or the improper use of personal information could raise issues.
2.	**Data Security**	Security breaches and data hacks can compromise consumer data, leading to identity theft or financial losses. Consumers may question the security measures in place to protect their information.
3.	**Transparency Issues**	Lack of transparency regarding data collection and usage practices can be a concern. Consumers may not fully understand how their data is being used for analytics, leading to mistrust.
4.	**Opt-Out Challenges**	Some consumers may find it difficult to opt out of data collection or personalized services if they desire more privacy. Complex opt-out processes can be frustrating.
5.	**Over personalization**	While personalization can be beneficial, excessive personalization may feel invasive to some consumers. They may prefer a balance between tailored recommendations and privacy.
6.	**Bias and Discrimination**	Consumers may worry that analytics algorithms incorporate biases that result in discriminatory outcomes. This can be especially concerning in sectors like finance, healthcare, and hiring.
7.	**Unwanted Marketing**	Overly personalized marketing efforts can lead to information overload and a perception of intrusiveness. Consumers may receive excessive promotional emails or ads based on their online activity.
8.	**Misinterpretation of Data**	Consumers may be concerned about businesses misinterpreting their data, leading to incorrect assumptions about their preferences or needs.
9.	**Loss of Human Touch**	In service sectors like healthcare or customer support, consumers may feel that analytics-driven automation reduces the human touch and empathy in interactions.
10.	**Limited Control**	Consumers may feel that they have limited control over the data collected about them and how it's used. Lack of control can lead to feelings of powerlessness.
11.	**Complexity**	Some consumers may find the complexity of analytics-driven systems overwhelming. They may struggle to understand how algorithms make decisions or recommendations.

12.	**Inaccurate Recommendations**	Consumers may receive inaccurate or irrelevant recommendations due to limitations in the analytics algorithms. This can lead to frustration and reduced trust in the system.
13.	**Stigmatization**	In healthcare and insurance, consumers may fear that their data could lead to stigmatization or higher costs if they are identified as high-risk individuals.
14.	**Lack of Alternatives**	Consumers may have limited alternatives to using services that rely heavily on tech-business analytics. They may feel compelled to accept data collection and personalization as a trade-off for access to these services.
15.	**Regulatory Concerns**	Consumers may be concerned about the adequacy of regulations to protect their rights and privacy in the context of analytics. Changes in regulations can also be confusing for consumers.
16.	**Misuse of Predictive Analytics**	In sectors like criminal justice or credit scoring, consumers may be concerned about the potential misuse of predictive analytics, which could lead to unfair treatment.

Consumers' perspectives on tech-business analytics in the tertiary sector can vary widely, with some individuals valuing personalized services and others expressing concerns about privacy and ethical considerations. Balancing the benefits of analytics with these constraints is an ongoing challenge for businesses and regulatory bodies.

8.3.4 Disadvantages on Tech-business Analytics in Tertiary industry sector from consumer point of view:

Tech-business analytics in the tertiary industry sector, while offering numerous benefits, can also present several disadvantages from a consumer's point of view. These disadvantages may raise concerns and impact the consumer experience. Table 39 identifies some of the key disadvantages:

Table 39: Disadvantages on Tech-business Analytics in Tertiary industry sector from consumer point of view

S. No.	Aspects	Description
1.	**Privacy Concerns**	Concerns over how much personal data is gathered, saved, and used for analytics purposes may arise from consumers. An example of this may be worries about data breaches or unauthorized access to their data.
2.	**Data Security Risks**	A major worry is the safety of customer data. Cyberattacks and data breaches can make personal and financial information vulnerable, which may result in identity theft or financial loss.
3.	**Transparency Issues**	Lack of transparency regarding data collection and usage practices can lead to mistrust. Consumers may not fully understand how their data is being used for analytics, which can create concerns.
4.	**Opt-Out Challenges**	Some consumers may find it difficult to opt out of data collection or personalized services. Complex and confusing opt-out processes can be frustrating and may lead to a sense of powerlessness.
5.	**Over personalization**	While personalization can enhance the consumer experience, excessive personalization can feel invasive. Consumers may prefer a balance between tailored recommendations and maintaining their privacy.

6.	**Bias and Discrimination**	Consumers may worry that analytics algorithms incorporate biases that result in discriminatory outcomes. This can be especially concerning in sectors like finance, healthcare, and hiring.
7.	**Unwanted Marketing**	Overly personalized marketing efforts can lead to information overload and a perception of intrusiveness. Consumers may feel bombarded with promotional emails or ads based on their online activity.
8.	**Misinterpretation of Data**	Consumers may be concerned about businesses misinterpreting their data, leading to incorrect assumptions about their preferences or needs. This can result in irrelevant recommendations or offers.
9.	**Loss of Human Interaction**	In service sectors like healthcare or customer support, consumers may feel that analytics-driven automation reduces the human touch and empathy in interactions, leading to a less satisfying experience.
10.	**Complexity**	Some consumers may find the complexity of analytics-driven systems overwhelming. They may struggle to understand how algorithms make decisions or recommendations, which can lead to frustration.
11.	**Inaccurate Recommendations**	Consumers may receive inaccurate or irrelevant recommendations due to limitations in the analytics algorithms. This can lead to dissatisfaction with the service.
12.	**Lack of Control**	Consumers may feel that they have limited control over the data collected about them and how it's used. Lack of control can lead to feelings of vulnerability.
13.	**Stigmatization**	In sectors like healthcare and insurance, consumers may fear that their data could lead to stigmatization or higher costs if they are identified as high-risk individuals.
14.	**Misuse of Predictive Analytics**	In sectors like criminal justice or credit scoring, consumers may be concerned about the potential misuse of predictive analytics, which could result in unfair treatment or profiling.
15.	**Regulatory Concerns**	Consumers may worry about the adequacy of regulations to protect their rights and privacy in the context of analytics. Changes in regulations can also be confusing for consumers.
16.	**Limited Alternatives**	In some cases, consumers may have limited alternatives to using services that rely heavily on tech-business analytics. They may feel compelled to accept data collection and personalization as a trade-off for access to these services.

These disadvantages highlight the need for businesses to prioritize consumer privacy, data security, and transparency in their analytics practices. Striking a balance between the benefits of analytics and consumer concerns is essential for maintaining trust and providing a positive consumer experience.

9. IMPLEMENTATION, AND IMPACT OF TECH -BUSINESS ANALYTICS ON EFFICIENCY OF TERTIARY INDUSTRY SECTOR :

A wide range of businesses, including companies in business, administration, transportation, finance, real estate, business and personal services, as well as in education, health, TBA, and social work, are included in the tertiary sector. The main endeavour in the tertiary sector of the economy is the rendering of services. Tasks completed on behalf of clients are referred to as services. Among the companies in the tertiary sector are theatres, banks, supermarkets, and hair salons. The tertiary sector, also referred to as the service sector, consists of businesses in the transportation, banking, tourist,

hotel, insurance, business, tech-business analytics, and other service-related sectors. The tertiary industry in India thus includes TBA.

9.1 Implementation of Tech-Business in Tertiary Industry Sector:

The tertiary industry sector's use of tech-business analytics involves the processes listed in table 40:

Table 40: Implementation of Tech-Business in Tertiary Industry Sector

S. No.	Aspects	Description
1.	Define the problem or objective	Decide what business issue or goal tech-business analytics may help with, such as enhancing customer experience, decreasing expenses, or improving operational efficiency.
2.	Data collection and preparation	Gather and prepare the data needed for Tech-business analytics, making sure it is accurate, dependable, and pertinent to the issue or goal.
3.	Select the appropriate Tech-business analytics tools	Choose the proper tech-business analytics tools, based on the issue or goal, such as data mining, predictive analytics, or machine learning.
4.	Build the Tech-business analytics model	Utilise the chosen tools and approaches to build the Tech-business analytics model, then validate it to make sure the output is accurate and trustworthy.
5.	Integrate Tech-business analytics with business processes	Make sure the Tech-business analytics model is integrated with business systems and processes so that it is in line with the goals and strategies of the company.
6.	Train employees	Provide employees with training on the usage of tech-business analytics to make sure they have the skills and knowledge needed to use the technology effectively..
7.	Monitor and evaluate performance	Analyse the performance of the tech-business analytics model and make any necessary improvements to make sure it keeps adding value to the company.

Hence, rigorous planning, data preparation, connection with business processes, continual monitoring and evaluation to make sure it adds value to the business, and deployment of tech-business analytics in the Tertiary industry sector are all necessary for success.

9.2 Impact of Tech-Business in Tertiary Industry Sector:

The tertiary sector, commonly referred to as the service industry, has been significantly impacted by the technology and business industries. The tech-business sector has influenced the tertiary sector in the following ways as given in table 41:

Table 41: Impact of Tech-Business in Tertiary Industry Sector

S. No.	Aspects	Description
1.	Digital Transformation	The digital transformation that has completely changed the service sector has been spearheaded by tech companies. Tech companies have developed new digital platforms and services that have changed the way services are provided, including online banking, e-commerce, cloud computing, and many other areas.
2.	Automation	Many tasks in the service sector, including customer support, data analysis, and inventory management, have been automated as a result of the use of technology. The industry now operates more productively and efficiently as a result.

3.	New Services	There are now new services available that were previously unavailable in the tertiary sector thanks to the tech-business sector. For instance, the way consumers buy food has altered as a result of the disruption of the traditional taxi sector by ride-hailing services like Uber and Lyft and the food delivery industry by apps like Uber Eats and Door Dash.
4.	Job Creation	Software developers, data analysts, and experts in digital marketing are just a few of the new positions that have been created in the tertiary sector as a result of the expansion of the tech-business industry.
5.	Increased Competition	As new digital platforms and services have entered the market, the technology business sector has boosted competition in the tertiary sector. This has spurred innovation and enhanced services for customers.

Thus, the tech-business sector has had a substantial impact on the tertiary sector, resulting in improved productivity, efficiency, and innovation in the service sector.

10. ABCD ANALYSIS OF INTEGRATION OF BA WITH ICCT UT IN SERVICE INDUSTRY:

10.1 ABCD of Integrating Business Analytics with AI & Robotics in Service Industry:

Table 42: ABCD Analysis of Integration of BA with AI & Robotics:

S. No.	Aspects	Description
Advantages:		
1	**Improved Decision-Making**	AI and robotics can analyze vast amounts of data quickly and accurately, aiding businesses in making data-driven decisions for service optimization.
2	**Enhanced Efficiency**	Automation through robotics reduces human errors and speeds up service processes, resulting in higher efficiency and productivity.
3	**Cost Reduction**	Automating routine tasks with robotics can lower labor costs, especially in industries with labor-intensive services.
4	**Personalized Services**	Artificial intelligence (AI)-driven analytics can offer insights into customer preferences, enabling organizations to provide personalized offerings that may boost client pleasure and loyalty.
5	**24/7 Availability**	Robots and AI systems can operate around the clock, ensuring uninterrupted service availability, which is particularly beneficial for global businesses.
6	**Predictive Maintenance**	Analytics can predict when robots and machines require maintenance, reducing downtime and service disruptions.
Benefits:		
1	**Competitive Advantage**	Early adopters can gain a significant edge in service quality, cost-effectiveness, and innovation, giving them a competitive advantage in the market.
2	**Scalability**	Robotics and AI systems can be easily scaled to handle increased service demands without proportionally increasing labor costs.
3	**Data-Driven Insights**	Businesses can get more comprehensive understandings of consumer behavior, market trends, and operational effectiveness, enabling well-informed strategic planning.
4	**Customer Satisfaction**	Higher levels of customer satisfaction may result from quicker response times and personalized service offers.

5	**Risk Mitigation**	Real-time risk and issue identification through analytics enables companies to take preventative action to lessen them.
Constraints:		
1	**High Initial Costs**	Implementing AI and robotics systems can require significant upfront investments in technology, infrastructure, and training.
2	**Technological Dependence**	Over-reliance on technology can be risky, as system failures or cyberattacks can disrupt service delivery.
3	**Job Displacement Concerns**	The automation of tasks can lead to concerns about job displacement and workforce adjustments, which may require careful management and retraining.
4	**Data Privacy and Security**	Strong data privacy and security procedures are needed to handle sensitive consumer data and integrate AI in order to prevent breaches and compliance difficulties.
5	**Complex Implementation**	Integrating AI and robotics into existing service processes can be complex and may require careful planning and execution.
Disadvantages :		
1	**Loss of Human Touch**	Over-automation can result in a loss of the human touch, which may be critical in certain service sectors, such as healthcare and customer support.
2	**Ethical Concerns**	AI algorithms can introduce biases and ethical dilemmas, which need to be addressed, especially in decision-making processes.
3	**Maintenance Costs**	While predictive maintenance can reduce downtime, maintaining AI and robotics systems can be costly.
4	**Resistance to Change**	Employees and customers may resist the integration of AI and robotics, leading to implementation challenges.
5	**Regulatory Hurdles**	Service industries may face regulatory barriers and compliance challenges when implementing AI and robotics, especially in highly regulated sectors.

As a result, combining business analytics with AI and robotics in the service sector has many advantages, including better decision-making, more efficiency, and lower costs. However, it also has drawbacks and limitations in terms of prices, worries about employment displacement, moral dilemmas, and regulatory difficulties that organizations must carefully evaluate and handle during implementation.

10.2 ABCD of Integrating Business Analytics with Blockchain in Service Industry:

Table 43: ABCD Analysis of Integration of BA with Blockchain

S. No.	Aspects	Description
Advantages:		
1	**Enhanced Data Security**	Data security and integrity are guaranteed by the decentralized, immutable ledger of blockchain, which lowers the possibility of data breaches.
2	**Transparency**	The transparency and auditability of transactions and data provided by blockchain increases confidence between service providers and clients.

3	**Efficiency**	Smart contracts on blockchain can automate and streamline service-related processes, reducing manual intervention and associated errors.
4	**Cost Reduction**	Eliminating intermediaries and automating processes can lead to cost savings in transactions and service delivery.
5	**Traceability**	Blockchain enables end-to-end traceability of products and services, which is valuable for quality control and compliance.
Benefits:		
1	**Data Analytics Accuracy**	Blockchain's high-quality data can be leveraged for more accurate and insightful analytics, aiding in data-driven decision-making.
2	**Immutable Records**	Immutable blockchain records ensure the accuracy and reliability of historical data, improving the reliability of business analytics.
3	**Fraud Prevention**	Blockchain can help in detecting and preventing fraudulent activities through real-time monitoring and verification.
4	**Global Collaboration**	Blockchain allows for secure data sharing and collaboration across service providers and customers globally.
5	**Regulatory Compliance**	Blockchain's transparent ledger can simplify compliance with industry regulations and standards.
Constraints:		
1	**Scalability**	Blockchain networks can face scalability challenges when handling a large volume of transactions, impacting performance.
2	**Complexity**	Implementing and integrating blockchain technology can be complex, requiring specialized expertise.
3	**Energy Consumption**	Some blockchain networks, like Bitcoin, can consume significant energy, raising environmental concerns.
4	**Interoperability**	Ensuring compatibility with existing systems and standards can be challenging when integrating blockchain
5	**Privacy Concerns**	Striking a balance between transparency and privacy can be difficult, especially in industries with sensitive data.
Disadvantages:		
1	**Cost of Implementation**	Implementing blockchain technology can be expensive due to development, infrastructure, and training costs.
2	**Lack of Regulation**	The regulatory landscape for blockchain is still evolving, creating uncertainty and potential compliance challenges.
3	**User Adoption**	Users and stakeholders may be hesitant to embrace blockchain technology due to its relative novelty and complexity.
4	**Data Recovery**	Data on a blockchain is immutable, which means that recovering lost or erroneous data can be extremely challenging.
5	**Centralization Risk**	While blockchain is designed to be decentralized, in practice, some networks can become centralized due to mining or validation concentration.

Thus, integrating business analytics with blockchain in the service industry offers advantages such as enhanced data security, transparency, and efficiency. However, challenges related to scalability,

complexity, and regulatory concerns must be carefully considered. Overall, successful implementation can provide a foundation for improved data analytics, efficiency, and trust in service-related processes.

10.3 ABCD of Integrating Business Analytics with Cloud Computing in Service Industry:

Table 44: ABCD Analysis of Integration of BA with Cloud Computing

S. No.	Aspects	Description
Advantages:		
1	**Scalability**	Businesses can effectively handle variable workloads thanks to cloud computing's flexibility to scale analytical resources up or down in response to demand.
2	**Cost-Efficiency**	Pay-as-you-go models are frequently used by cloud services, which eliminates the need for substantial upfront expenditures on infrastructure and software.
3	**Accessibility**	As they can be viewed from any location with an internet connection, cloud-based analytics encourage collaboration between remote teams.
4	**Real-Time Data**	Cloud-based analytics can process and analyze real-time data, enabling quicker decision-making and more timely responses to service-related issues.
5	**Automatic Updates**	Cloud providers handle infrastructure updates and maintenance, ensuring that analytics tools are up to date and secure.
Benefits:		
1	**Improved Data Processing**	Cloud platforms can handle large volumes of data, facilitating complex analytics and generating valuable insights.
2	**Data Integration**	Analytics are improved in terms of quality and depth thanks to the integration of data from diverse sources made possible by cloud services.
3	**Enhanced Collaboration**	Cloud-based analytics tools can be easily shared among teams, fostering collaboration and knowledge sharing.
4	**Disaster Recovery**	Cloud providers offer robust backup and disaster recovery solutions, safeguarding critical service-related data.
5	**Global Reach**	Cloud computing enables service providers to reach a global audience by hosting services and analytics tools in multiple regions.
Constraints:		
1	**Security Concerns**	Secure data storage practices and compliance observance may be required if sensitive service-related data is stored in the cloud.
2	**Data Transfer Costs**	Large volumes of data transfer between on-premises systems and the cloud can incur additional costs.
3	**Data Privacy**	Complying with data privacy regulations, especially in international markets, can be complex when using cloud services.
4	**Vendor Lock-In**	Businesses may face challenges if they become too dependent on a single cloud provider, making it difficult to switch providers or integrate with other services.
5	**Latency**	Latency issues can arise when accessing cloud-based analytics, affecting the speed of data retrieval and analysis.

Disadvantages:		
1	**Downtime Risk**	Cloud outages can disrupt service operations and analytics processes, leading to downtime and potential business losses.
2	**Limited Control**	Businesses may have limited control over the underlying infrastructure, which can be a disadvantage when customizing analytics environments.
3	**Data Ownership**	Clarifying data ownership and responsibility between the business and the cloud provider is essential to avoid conflicts and data loss.
4	**Data Transfer Speed**	Uploading large volumes of data to the cloud for analysis can be time-consuming and impact operational efficiency.
5	**Cost Overruns**	Without careful monitoring and management, cloud costs can escalate beyond budgeted amounts.

Thus, integrating business analytics with cloud computing in the service industry offers scalability, cost-efficiency, and accessibility benefits. However, it also presents challenges related to security, data privacy, and control. Successful implementation involves careful planning, security measures, and compliance considerations to leverage the advantages while mitigating the constraints and disadvantages.

10.4 ABCD of Integrating Business Analytics with Cyber Security in Service Industry:

Table 45: ABCD Analysis of Integration of BA with Cyber Security

S. No.	Aspects	Description
Advantages:		
1	**Early Threat Detection**	To find abnormalities and potential cybersecurity problems before they become serious, business analytics may analyze enormous amounts of data.
2	**Improved Incident Response**	Analytics can enhance the speed and accuracy of incident response by providing real-time insights into cyberattacks or breaches.
3	**Data Protection**	Analytics can monitor data access and usage patterns, helping businesses protect sensitive customer and company data.
4	**Risk Assessment**	By analyzing historical data, businesses can better assess their cybersecurity risks and make informed decisions about resource allocation.
5	**Compliance Management**	Analytics can aid in ensuring compliance with cybersecurity regulations and standards by providing evidence of security measures and practices.
Benefits:		
1	**Customized Security**	Analytics can help tailor cybersecurity measures to specific service industry needs, enhancing protection and reducing false positives.
2	**Cost Reduction**	Early threat detection and efficient incident response can reduce the financial impact of cyberattacks and breaches.
3	**Proactive Defense**	Predictive analytics can anticipate cyber threats, allowing businesses to proactively fortify their defenses.

4	**Improved User Experience**	Enhanced security through analytics can lead to increased customer trust and satisfaction in service delivery.
5	**Data-Driven Decision-Making**	Data analytics can guide decisions on cybersecurity investments and strategies for maximum effectiveness.
Constraints:		
1	**Data Privacy**	Handling cybersecurity data raises privacy concerns, requiring careful management to avoid breaches and regulatory issues.
2	**Complex Implementation**	Integrating analytics with cybersecurity can be complex and may require specialized skills and technologies.
3	**False Positives**	Overreliance on analytics can result in false alarms or misinterpretation of data, potentially diverting resources from real threats.
4	**Resource Intensive**	Effective analytics often require substantial computing power and data storage resources.
5	**Skill Gap**	A shortage of skilled cybersecurity analysts and data scientists can be a constraint in implementing advanced analytics solutions.
Disadvantages:		
1	**Cost**	Implementing and maintaining advanced analytics for cybersecurity can be expensive, particularly for smaller service businesses.
2	**Complexity**	Analyzing vast amounts of data can introduce complexity, making it challenging to extract actionable insights quickly.
3	**False Negatives**	While analytics can help detect threats, no system is foolproof, and false negatives can lead to security breaches.
4	**Dependency on Technology**	Overreliance on analytics can create a false sense of security and may neglect the importance of human expertise in cybersecurity.
5	**Scalability**	Scaling up analytics to handle increasing data volumes and evolving threats can be challenging.

Hence, integrating business analytics with cybersecurity in the service industry provides early threat detection, improved incident response, and customized security measures. However, it also comes with constraints related to data privacy, complexity, and resource requirements. Effective implementation requires a balance between technology, human expertise, and compliance considerations.

10.5 ABCD of Integrating Business Analytics with Internet of Things (IoT) in Service Industry:

Table 46: ABCD Analysis of Integration of BA with Internet of Things (IoT)

S. No.	Aspects	Description
Advantages:		
1	**Real-Time Insights**	IoT devices provide a continuous stream of data, enabling real-time analytics for quicker decision-making.
2	**Predictive Maintenance**	Analytics can predict when service equipment needs maintenance, reducing downtime and improving reliability.

3	**Cost Reduction**	By optimizing resource allocation and maintenance schedules, businesses can achieve cost savings.
4	**Enhanced Customer Experience**	IoT-powered analytics can lead to improved service quality and personalization, enhancing customer satisfaction.
5	**Efficiency**	Automation through IoT and analytics streamlines service processes, reducing manual effort and errors.
Benefits:		
1	**Data-Driven Decisions**	IoT analytics enables data-driven decision-making, allowing businesses to optimize service operations and improve service delivery.
2	**Customized Services**	IoT data can be used to tailor services to individual customer needs, leading to higher customer retention rates.
3	**Competitive Advantage**	Early adopters of IoT analytics can gain a competitive edge by offering more efficient and innovative services.
4	**Resource Optimization**	Analytics can help optimize the allocation of service personnel and equipment, improving resource efficiency.
5	**Proactive Issue Resolution**	IoT data and analytics can identify service issues in real time, allowing for proactive resolution.
Constraints:		
1	**Data Security**	IoT devices and data streams can be vulnerable to cyberattacks, requiring robust security measures.
2	**Data Privacy**	Handling vast amounts of data from IoT devices can raise privacy concerns, necessitating compliance with regulations.
3	**Integration Complexity**	Integrating IoT devices and data into existing systems and analytics platforms can be complex.
4	**Scalability**	As IoT deployments grow, managing and scaling analytics infrastructure becomes more challenging.
5	**Cost of Implementation**	Deploying IoT sensors and setting up analytics systems can be costly, particularly for smaller businesses.
Disadvantages :		
1	**Reliability**	IoT devices can experience technical failures or connectivity issues, affecting the accuracy of analytics.
2	**Data Overload**	Managing and analyzing vast amounts of IoT data can be overwhelming, potentially leading to information overload.
3	**Dependency on Technology**	Overreliance on IoT and analytics may neglect the importance of human expertise in service delivery.

4	**Regulatory Compliance**	IoT data handling must adhere to regulations, which can be complex and vary by region.
5	**Complexity in Decision-Making**	Interpretation of IoT data and analytics can be complex, requiring skilled analysts.

Therefore, combining business analytics with the Internet of Things (IoT) in the services sector offers real-time insights, preventative maintenance, and cost savings. It does, however, also bring up issues with cost, complexity, data privacy, and security. Technology, security precautions, and compliance issues must all be balanced for implementation to be successful.

10.6 ABCD of Integrating Business Analytics with 3D Printing in Manufacturing Industry:

Table 47: ABCD Analysis of Integration of BA with 3D Printing

S. No.	Aspects	Description
Advantages:		
1	**Cost Reduction**	Analytics can optimize 3D printing processes, reducing material waste and operational costs.
2	**Customization**	Data-driven insights can enable highly customized 3D-printed products to meet specific customer requirements.
3	**Efficiency**	Analytics can streamline production workflows, improving the speed and accuracy of 3D printing.
4	**Inventory Management**	Businesses can reduce inventory levels by 3D printing parts on-demand, leading to lower storage costs.
5	**Quality Control**	Analytics can monitor and ensure the quality of 3D-printed products, reducing defects and rework.
Benefits:		
1	**Improved Product Design**	Analytics can inform product design by analyzing performance data, resulting in better, more efficient designs.
2	**Sustainability**	Data analytics can identify eco-friendly materials and printing methods, promoting sustainable manufacturing.
3	**Rapid Prototyping**	Analytics-driven 3D printing enables rapid prototyping, speeding up product development cycles.
4	**Supply Chain Resilience**	On-demand 3D printing can reduce reliance on complex supply chains, enhancing resilience.
5	**Competitive Advantage**	Businesses adopting advanced analytics with 3D printing gain a competitive edge through cost-effectiveness and innovation.
Constraints:		
1	**Data Security**	Protecting sensitive design and production data from cyber threats is critical.

2	**Intellectual Property Concerns**	Sharing 3D printing files and data analytics may raise intellectual property and copyright issues.
3	**Initial Investment**	Implementing analytics and 3D printing technology can involve significant upfront costs.
4	**Skilled Workforce**	Skilled personnel are needed to manage and interpret the data and oversee 3D printing operations.
5	**Regulatory Compliance**	Manufacturing regulations may not fully accommodate 3D printing, requiring adaptation and compliance efforts.
Disadvantages:		
1	**Limited Material Options**	Compared to traditional manufacturing methods, 3D printing materials are somewhat limited in diversity.
2	**Speed Constraints**	3D printing can be slower than conventional manufacturing for large-scale production runs.
3	**Complexity**	Integrating data analytics and 3D printing can be complex and may require customized solutions.
4	**Quality Control Challenges**	Ensuring consistent quality in 3D-printed products can be challenging due to variations in material and technology.
5	**Dependency on Technology**	Overreliance on technology may overlook the importance of human expertise in manufacturing.

Hence, integrating business analytics with 3D printing in the manufacturing industry offers advantages such as cost reduction, customization, and improved efficiency. However, it also poses challenges related to data security, intellectual property, and initial investment. Successful implementation involves balancing technology with security measures, compliance, and workforce skill development.

10.7 ABCD of Integrating Business Analytics with Mobile Communication in Service Industry:

Table 48: ABCD Analysis of Integration of BA with Mobile Communication

S. No.	Aspects	Description
Advantages:		
1	**Real-Time Data Access**	Mobile communication enables access to real-time data, allowing service providers to make informed decisions on the go.
2	**Improved Customer Engagement**	Mobile apps and messaging platforms enable direct and personalized communication with customers, enhancing engagement.
3	**Enhanced Efficiency**	Business analytics can optimize mobile workflows, reducing response times and increasing service efficiency.
4	**Location-Based Services**	Mobile analytics can utilize location data for targeted marketing, service recommendations, and improved logistics.
5	**Cost Savings**	By streamlining processes and improving resource allocation, mobile analytics can lead to cost reductions.

Benefits:		
1	**Customer Insights**	Analytics on mobile interactions provide valuable insights into customer behavior, preferences, and needs.
2	**Personalized Service**	Mobile analytics enables tailored services and recommendations, increasing customer satisfaction and loyalty.
3	**Competitive Advantage**	Businesses with mobile analytics can respond quickly to market changes and customer demands, gaining a competitive edge.
4	**Data-Driven Marketing**	Analytics can inform mobile marketing strategies, optimizing ad targeting and increasing conversion rates.
5	**Remote Management**	Mobile communication allows remote monitoring and management of service operations, reducing the need for physical presence.
Constraints:		
1	**Privacy Concerns**	Collecting and analyzing mobile data must adhere to strict privacy regulations to protect customer information.
2	**Data Security**	Ensuring the security of mobile data and communications is essential to prevent data breaches.
3	**Device and OS Fragmentation**	Analytics integration and app creation may be made more difficult by the variety of mobile devices and operating systems.
4	**Technical Challenges**	Mobile analytics may face challenges related to network connectivity, device compatibility, and data synchronization.
5	**User Adoption**	Encouraging customers and employees to use mobile apps and services for data collection can be a hurdle.
Disadvantages:		
1	**Dependency on Connectivity**	Mobile analytics depend on network connectivity, and disruptions can impede data access and decision-making.
2	**Data Volume**	Handling large volumes of mobile data for analysis can be resource-intensive.
3	**Data Accuracy**	Mobile data can sometimes be inaccurate or incomplete, leading to potential errors in analytics.
4	**Implementation Costs**	Developing and maintaining mobile analytics solutions can be costly, especially for small businesses.
5	**Data Overload**	The abundance of mobile data can lead to information overload, making it challenging to extract actionable insights.

Hence, integrating business analytics with mobile communication in the service industry offers real-time insights, personalized services, and cost savings. However, it also presents challenges related to privacy, security, technical complexity, and user adoption. Successful implementation requires a balance between data-driven decision-making and safeguarding customer privacy and data security.

10.8 ABCD of Integrating Business Analytics with Information Storage Technology in Service Industry:

Table 49: ABCD Analysis of Integration of BA with Information Storage

S. No.	Aspects	Description
Advantages:		
1	**Data Accessibility**	Information storage technology provides quick and easy access to vast amounts of data, facilitating analytics.
2	**Data Retention**	Storage solutions can retain historical data, enabling trend analysis and long-term decision-making.
3	**Scalability**	As data volumes grow, storage technology can scale to accommodate the increasing data storage needs of analytics.
4	**Data Integration**	Information storage technology allows the consolidation of data from various sources, enhancing the quality of analytics.
5	**Cost Efficiency**	Efficient storage systems can reduce the cost of storing and managing large datasets for analysis.
Benefits:		
1	**Informed Decision-Making**	Analytics on stored data provide valuable insights for informed and data-driven decision-making.
2	**Predictive Analytics**	Historical data stored in these systems can be used for predictive analytics, anticipating future service trends and demands.
3	**Efficiency Optimization**	Analysis of stored data can help identify areas for process improvement and resource optimization.
4	**Customer Insights**	Analytics on historical customer data can lead to better understanding and targeting of customer needs and preferences.
5	**Compliance and Audit Trails**	Information storage technology can maintain detailed records for compliance purposes and auditing.
Constraints:		
1	**Data Security**	Protecting sensitive data stored in these systems is paramount to prevent unauthorized access and data breaches.
2	**Data Privacy**	Managing customer data requires compliance with data privacy regulations, adding complexity to storage and analytics.
3	**Cost of Implementation**	Deploying and maintaining information storage technology and analytics tools can be expensive.
4	**Complexity**	Integrating diverse data sources and formats from storage systems can be technically complex.
5	**Scalability Challenges**	Scaling storage and analytics infrastructure to handle growing data volumes can be challenging.
Disadvantages:		
1	**Data Overload**	Storing vast amounts of data can lead to information overload, making it challenging to extract meaningful insights.
2	**Maintenance Complexity**	Maintaining and managing complex storage and analytics systems can be resource-intensive.

3	**Data Redundancy**	Without proper data governance, information storage systems can lead to data redundancy and inconsistencies.
4	**Dependency on Technology**	Overreliance on storage technology may neglect the importance of human expertise in data analysis.
5	**Initial Investment**	Implementing advanced storage and analytics solutions can require significant upfront investments.

Hence, integrating business analytics with information storage technology in the service industry provides data accessibility, informed decision-making, and predictive analytics. However, it also poses challenges related to data security, complexity, and compliance. Successful implementation involves a balance between technology, data governance, and cost considerations.

10.9 ABCD of Integrating Business Analytics with Ubiquitous Education Technology in Service Industry:

Table 50: ABCD Analysis of Integration of BA with Ubiquitous Education

S. No.	Aspects	Description
Advantages:		
1	**Data-Driven Training**	Business analytics can provide insights into employee training needs, ensuring that staff have the right skills for optimal service delivery.
2	**Performance Monitoring**	Ubiquitous education technology allows continuous performance monitoring, enabling analytics-driven feedback and improvement.
3	**Personalized Learning**	Analytics can tailor educational content to individual employee needs, enhancing the effectiveness of training programs.
4	**Efficient Resource Allocation**	By analyzing training data, businesses can allocate resources more efficiently, reducing training costs.
5	**Competitive Workforce**	A well-trained workforce can provide a competitive advantage by delivering high-quality services.
Benefits:		
1	**Improved Employee Skills**	Analytics-driven education technology ensures that employees have the skills and knowledge necessary to excel in their roles.
2	**Higher Service Quality**	A well-trained workforce delivers higher-quality services, leading to increased customer satisfaction.
3	**Cost Savings**	Targeted training based on analytics can reduce training costs and improve the return on investment for education technology.
4	**Scalable Learning**	Ubiquitous education technology allows businesses to scale training programs easily to accommodate growth.
5	**Adaptive Learning**	Analytics can identify areas where employees struggle and adapt training content to address those challenges.
Constraints:		
1	**Data Privacy**	Handling employee training data requires compliance with data privacy regulations, adding complexity to data management.
2	**Technology Dependence**	Overreliance on technology may neglect the importance of in-person or hands-on training methods.

3	**Resource Intensive**	Implementing education technology and analytics systems can be costly, particularly for smaller businesses.
4	**Skill Gap**	A lack of skilled personnel to manage and interpret training data and analytics can be a constraint.
5	**Resistance to Change**	Employees may resist the adoption of new training technologies and methods, requiring change management efforts.
Disadvantages:		
1	**Technical Challenges**	Integrating education technology with analytics can be complex, requiring compatibility and data integration efforts.
2	**Content Quality**	Poor-quality training content can result in ineffective education, even when analytics are applied.
3	**Data Overload**	Collecting and analyzing a vast amount of training data can lead to information overload, making it challenging to extract actionable insights.
4	**Initial Investment**	Implementing advanced education technology and analytics solutions can require significant upfront investments.
5	**User Experience**	The user experience of education technology may not always be optimal, affecting its effectiveness.

Hence, integrating business analytics with ubiquitous education technology in the service industry provides data-driven training, improved service quality, and cost savings. However, it also presents challenges related to data privacy, technology dependence, and employee resistance. Successful implementation requires a balance between technology, change management, and data governance considerations.

10.10 ABCD of Integrating Business Analytics with Virtual and Augmented Reality Technology in Service Industry:

Table 51: ABCD Analysis of Integration of BA with Virtual and Augmented Reality

S. No.	Aspects	Description
Advantages:		
1	**Enhanced Customer Experience**	Virtual and augmented reality can provide immersive and interactive experiences, improving customer engagement and satisfaction.
2	**Data Visualization**	Business analytics can turn complex data into visual representations in VR/AR, making it easier for users to comprehend and analyze information.
3	**Training and Simulation**	VR/AR can be used for realistic training simulations, and analytics can monitor employee performance and learning progress.
4	**Remote Assistance**	AR can enable remote experts to provide real-time assistance, and analytics can track the effectiveness of such support.
5	**Product Demonstrations**	VR/AR can facilitate detailed product demonstrations and analytics can measure customer interest and interactions.
Benefits:		
1	**Improved Decision-Making**	Analytics in VR/AR environments can provide decision-makers with real-time data and insights for more informed choices.

2	**Personalized Experiences**	Analytics can tailor VR/AR experiences based on user behavior and preferences, leading to higher engagement.
3	**Cost Savings**	VR/AR can reduce the need for physical prototypes and travel for demonstrations, resulting in cost savings.
4	**Efficient Training**	VR/AR analytics can identify areas where employees struggle in training scenarios, allowing for targeted improvements.
5	**Competitive Advantage**	Businesses using VR/AR analytics can gain a competitive edge through innovation and improved service quality.
Constraints:		
1	**Cost of Implementation**	Deploying VR/AR technology and analytics systems can involve significant upfront and ongoing expenses.
2	**Technical Complexity**	Integrating analytics into VR/AR platforms can be technically complex, requiring specialized skills.
3	**Data Privacy**	Handling user data in VR/AR environments must adhere to data privacy regulations, adding complexity to data management.
4	**User Adoption**	Some users may be hesitant to embrace VR/AR technology, requiring change management and training efforts.
5	**Content Quality**	Poor-quality VR/AR content can lead to ineffective user experiences and data analysis.
Disadvantages:		
1	**Dependency on Technology**	Overreliance on VR/AR technology may neglect the importance of traditional service delivery methods.
2	**Technical Limitations**	VR/AR technology may not always be capable of delivering the desired level of immersion or interactivity.
3	**Data Overload**	Collecting and analyzing vast amounts of VR/AR data can lead to information overload, making it challenging to extract actionable insights.
4	**User Experience Issues**	Technical glitches or discomfort in using VR/AR can result in negative user experiences
5	**Regulatory Challenges**	Navigating regulations and standards for VR/AR data and content can be complex.

Thus, integrating business analytics with virtual and augmented reality technology in the service industry offers enhanced customer experiences, improved decision-making, and cost savings. However, it also presents challenges related to cost, technical complexity, data privacy, and user adoption. Successful implementation requires a balance between technology, content quality, and data governance considerations.

10.11 ABCD of Integrating Business Analytics with Quantum Computing Technology in Service Industry:

Table 52: ABCD Analysis of Integration of BA with Quantum Computing

S. No.	Aspects	Description
Advantages:		
1	**Unprecedented Speed**	Quantum computing can perform complex analytics computations exponentially faster than classical computers, enabling real-time decision-making.

2	**Complex Problem Solving**	Quantum computing can tackle highly complex analytical problems that were previously unsolvable or required excessive time and resources.
3	**Advanced Data Processing**	Quantum computing can process vast datasets efficiently, providing deeper insights and improving predictive analytics.
4	**Optimization**	Quantum computing can optimize service operations, such as resource allocation and supply chain logistics, leading to cost savings.
5	**Competitive Advantage**	By using the capability of quantum computing for analytics, early adopters can obtain a huge competitive advantage.
Benefits:		
1	**Improved Decision-Making**	Quantum computing enables faster and more accurate decision-making based on highly sophisticated analytics.
2	**Enhanced Personalization**	Quantum computing can analyze intricate customer data for hyper-personalized service offerings.
3	**Resource Efficiency**	Quantum computing can optimize resource utilization, reducing waste and operational costs.
4	**Innovative Service Models**	Quantum-powered analytics can drive innovation in service delivery, opening new revenue streams.
5	**Scientific Breakthroughs**	In research-intensive service industries, quantum computing can facilitate breakthroughs and discoveries.
Constraints:		
1	**High Costs**	Quantum computing technology is expensive to develop, implement, and maintain, limiting its accessibility.
2	**Technical Complexity**	Quantum computing requires highly specialized expertise, and finding skilled professionals can be challenging.
3	**Limited Availability**	Quantum computing resources are limited and may not be readily available to all businesses.
4	**Security Concerns**	Quantum computing can potentially break existing encryption methods, raising security and privacy concerns.
5	**Integration Challenges**	Integrating quantum computing with existing IT infrastructure and analytics tools can be complex.
Disadvantages :		
1	**Dependency on Emerging Tech**	Relying on quantum computing technology involves risks associated with its experimental nature and evolving capabilities.
2	**Data Volume**	Quantum computing can generate enormous amounts of data, which may be challenging to manage and analyze.
3	**Regulatory Hurdles**	Regulatory frameworks for quantum computing in various industries may be unclear or underdeveloped.

4	**Resource Allocation**	Quantum computing resources may be limited, and competition for access can be fierce.
5	**Education Gap**	Training staff in quantum computing and analytics may require significant time and investment.

Hence, integrating business analytics with quantum computing technology in the service industry offers unprecedented speed and analytical capabilities. However, it also presents challenges related to cost, technical complexity, security, and resource availability. Successful implementation requires careful planning, investment, and consideration of potential risks and benefits.

11. POSTULATES & SUGGESTIONS :

In the context of tech business analytics (TBA) in the tertiary industry sector, postulates can be thought of as fundamental assumptions or principles, while suggestions are recommendations or ideas for how to effectively implement TBA in this sector. Here are some postulates and suggestions related to TBA in the tertiary industry sector:

(1) Data-Driven Decision Making: The successful implementation of TBA in the tertiary industry sector relies on the principle of making decisions based on data insights rather than intuition alone.

(2) Data Quality and Integrity: Accurate and high-quality data is essential for meaningful analysis. Postulate that data should be consistently collected, cleaned, and maintained to ensure reliable results.

(3) Continuous Learning: Embrace the concept that TBA is an ongoing process. Regularly update and refine analysis techniques to adapt to evolving customer behaviours and industry trends.

(4) Cross-Disciplinary Collaboration: Recognize the need for collaboration between technical analysts, business experts, and domain specialists to translate data insights into actionable strategies.

(5) Ethical Considerations: Acknowledge the importance of ethical data usage, respecting customer privacy, and adhering to data protection regulations.

(6) Clearly Define Objectives: Start by defining clear business objectives for implementing TBA. Determine what you aim to achieve, such as improving customer satisfaction, optimizing resource allocation, or enhancing operational efficiency.

(7) Choose Relevant Metrics: Select key performance indicators (KPIs) that align with your objectives. These metrics will guide your analysis and provide a focus for your efforts.

(8) Invest in Data Collection Tools: Explore modern tools for data collection, such as customer relationship management (CRM) software, online analytics platforms, and feedback mechanisms, to gather relevant data efficiently.

(9) Implement Predictive Analytics: Utilize predictive analytics to forecast future trends and outcomes. For example, predict customer demand patterns to optimize inventory management.

(10) Leverage Machine Learning: Integrate machine learning algorithms to uncover complex patterns in large datasets, enabling more accurate predictions and personalized customer experiences.

(11) Real-Time Analysis: Consider real-time data analysis to make rapid decisions in response to changing market dynamics or customer preferences.

(12) Visualize Insights: Use data visualization tools to present insights in a visually engaging manner, facilitating better understanding and communication among stakeholders.

(13) A/B Testing: Implement A/B testing for marketing campaigns or service offerings to evaluate which strategies yield the best results.

(14) Invest in Training: Provide training to employees involved in TBA processes to ensure they have the necessary skills to analyse data effectively and derive actionable insights.

(15) Feedback Loop: Establish a feedback loop between data analysis and business operations. Regularly assess the impact of data-driven decisions and adjust strategies accordingly.

(16) Experimentation: Encourage a culture of experimentation, where new ideas and strategies are tested and refined based on data insights.

(17) Benchmarking: Compare your TBA efforts with industry benchmarks to assess your performance and identify areas for improvement.

12. CONCLUSION :

Thus, the tertiary industry sector has been significantly impacted by the application of tech-business analytics. The way services are provided and consumed has changed as a result of tech-business

analytics, including digital transformation, automation, the development of new services, and job opportunities. Businesses in the tertiary sector can learn about customer behaviour, reorganise workflows, and develop specialised services that cater to client needs by leveraging the power of data and technology. The tertiary sector has seen greater competitiveness as a result of the tech-business analytics integration, which has sparked innovation and enhanced service delivery. Technology will continue to flourish, and the tertiary industry sector's use of tech-business analytics will only expand. This will result in further developments and advantages for both enterprises and consumers.

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