Tech-Business Analytics in Blue Economy

Sachin Kumar [1 & 2], Krishna Prasad K.[3] & P. S. Aithal [4]

[1] Dept. of Information Technology, Management Education & Research Institute (MERI), Affiliated to GGSIP University, New Delhi., India.
ORCID-ID: 0000-0002-1136-8009; E-mail: sachinks.78@gmail.com

[2] Post-Doctoral Research Fellow, Institute of Computer Science and Information Science, Srinivas University, Mangalore, India,

[3] Institute of Computer & Information Science, Srinivas University, Mangalore, India,
ORCID-ID: 0000-0001-5282-9038; E-mail: karanikrishna@gmail.com

[4] Director, Poornaprajna Institute of Management, Udupi, India,
OrcidID: 0000-0002-4691-8736; E-mail: psaithal@gmail.com

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Sachin Kumar [1 & 2], Krishna Prasad K.[3] & P. S. Aithal [4]

[1] Dept. of Information Technology, Management Education & Research Institute (MERI), Affiliated to GGSIP University, New Delhi., India.
ORCID-ID: 0000-0002-1136-8009; E-mail: sachinks.78@gmail.com

[2] Post-Doctoral Research Fellow, Institute of Computer Science and Information Science, Srinivas University, Mangalore, India,

[3] Institute of Computer & Information Science, Srinivas University, Mangalore, India,
ORCID-ID: 0000-0001-5282-9038; E-mail: karanikrishna@gmail.com

[4] Director, Poornaprajna Institute of Management, Udupi, India,
OrcidID: 0000-0002-4691-8736; E-mail: psaithal@gmail.com

ABSTRACT

Purpose: *Utilising cutting-edge technologies, data analytics, and entrepreneurial strategies to promote innovation, develop resilience, and drive sustainable growth are the main goals of Tech-Business projects in the Blue Economy for industries associated to the marine sector.*
Design/Methodology/Approach: *A methodical approach that combines cutting-edge technologies, analytical techniques, and commercial strategies is used to implement Tech-commercial initiatives in the Blue Economy.*
Findings/Result: *The results highlight the revolutionary effect of Tech-Business endeavours in propelling eco-friendly expansion, stimulating creativity, and fortifying the Blue Economy. Stakeholders can open up new possibilities and build a more affluent and sustainable future for coastal communities and marine ecosystems by embracing data-driven initiatives and utilising technology.*
Originality/Value: *The uniqueness of Tech-Business endeavours in the Blue Economy is found in their creative methods of resolving persistent issues and opening up fresh doors in the maritime sector.*
Paper Type: *Exploratory Research on Technology Management.*
Keywords: Business Analytics (BA), ICCT underlying technologies, Tech-Business Analytics, TBA, Industry Performance, Data Science, Big Data Analytics, Research gap in Business Analytics, ABCD Listing, Tech business Analytics, Service industry, ICCT, ABCD Analysis, Blue economy.

1. INTRODUCTION :

A key area for technical innovation, environmental sustainability, and economic growth is the Blue Economy, which is centred on the sustainable use of ocean resources. Tech Business Analytics is essential in this regard for streamlining decision-making processes, finding chances for expansion, and optimising operations. With an emphasis on its importance and potential uses, this introduction will explore the relationship between Tech Business Analytics and the Blue Economy.

Utilising cutting-edge technologies and analytical techniques to examine data produced by business operations is known as "tech business analytics." In order to obtain insights, spot trends, and arrive at wise conclusions, it includes a variety of methodologies such as data mining, machine learning, predictive analytics, and artificial intelligence.

Tech Business Analytics is a vital resource for improving productivity, sustainability, and profitability in the Blue Economy, which includes sectors like aquaculture, marine biotechnology, renewable energy, and marine transportation.

Resources management optimisation is one of the main uses of Tech Business Analytics in the Blue Economy. Enterprises can make well-informed judgements on fishing limits, aquaculture methods, and sustainable harvesting strategies by examining data pertaining to fisheries, environmental factors, and oceanographic conditions. In order to reduce risks and guarantee long-term sustainability,

proactive steps to forecast changes in ocean ecosystems can also be made possible using predictive analytics.

Additionally, tech business analytics helps the maritime industry optimise their supply chains. Businesses can find inefficiencies, cut costs, and enhance logistics operations by studying shipping routes, port operations, and cargo handling procedures. Better decisions about fuel usage, route planning, and vessel scheduling are made possible by real-time data analytics, which eventually improves overall operating efficiency.

Additionally, the Blue Economy relies heavily on Tech Business Analytics for innovation and product creation. Businesses can find chances to create new goods and services by evaluating consumer preferences, market trends, and emerging technologies. For instance, data analytics can help develop sustainable seafood products, marine biotechnology applications, or renewable energy solutions that meet consumer demand and the objectives of environmental preservation.

To sum up, tech business analytics is a potent instrument that promotes innovation, sustainability, and efficiency in the blue economy. Businesses may enhance economic growth and environmental stewardship in the maritime industry by optimising resource management, streamlining operations, and capitalising on emerging opportunities through the application of sophisticated technologies and analytical tools.

1.1 About blue economy and its Importance in TBA:

Using ocean resources sustainably to promote job development, economic expansion, and environmental sustainability is known as the "blue economy." Aquaculture, fisheries, marine transportation, renewable energy, marine biotechnology, and coastal tourism are just a few of the many industries it includes. Utilising data-driven insights to improve operations, advance sustainability, and spur innovation, Tech Business Analytics (TBA) is essential to realising the Blue Economy's potential.

Importance of the Blue Economy:

Economic Growth: Especially for coastal areas and maritime nations, the Blue Economy is a major driver of economic growth and development. Through industries including fishing, shipping, tourism, and offshore energy production, it creates jobs, attracts investment, and boosts GDP growth.

Resource Management: In order to guarantee environmental preservation and long-term viability, maritime resources must be managed effectively. Sustainable methods that strike a balance between ecosystem health and economic development are the foundation of the blue economy. By offering insights into fish stocks, ocean conditions, and ecosystem dynamics, TBA facilitates data-driven decision-making in resource management. This helps to implement sustainable fishing methods, manage aquaculture, and advance marine conservation activities.

Innovation and Technology: There are many of chances for technological innovation and breakthroughs in the context of the Blue Economy. Innovation is the key to increasing efficiency, productivity, and competitiveness in the maritime industry. Examples of this include autonomous vessels, underwater robotics, renewable energy technologies, and marine biotechnology. Through its analysis of market trends, identification of emerging technologies, and facilitation of research and development efforts, TBA plays a crucial role in promoting innovation.

Climate Change Resilience: Ocean ecosystems are facing serious problems from climate change, such as increasing sea levels, acidity of the ocean, and more frequent and severe weather. Because healthy oceans are necessary for reducing the effects of climate change and increasing adaptive capacity, the Blue Economy is intrinsically related to climate change resilience. The creation of adaptive strategies and resilience-building measures is facilitated by TBA, which makes it possible to monitor and assess hazards associated to climate change.

Global Trade and Connectivity: The movement of goods and commodities across international borders is made easier by maritime transit, which forms the foundation of global trade. The ports, shipping lanes, and marine infrastructure that are essential to international trade and connectivity are included in the Blue Economy. TBA facilitates international trade and economic integration by streamlining logistics processes, boosting port effectiveness, and strengthening supply chain management.

Therefore, there is great promise for both sustainable development and economic prosperity in the Blue Economy, and TBA is essential to bringing this potential to fruition. Through the utilisation of data analytics, decision-makers in business and government may make well-informed choices,

stimulate innovation, and encourage environmental responsibility in the marine industry. This, in turn, can lead to a more resilient and sustainable Blue Economy.

2. EFFECT OF ADVANCES IN TECHNOLOGY IN THE BLUE ECONOMY :

The Blue Economy has seen a radical transformation as a result of technological advancements, which have revolutionised a number of industries and created new chances for efficiency, creativity, and sustainable growth. Key outcomes of technology advancements in the Blue Economy include the following:

Improved Resource Management: The monitoring and management of marine resources have been substantially improved by technological advancements such as underwater robotics, drones, and satellite photography. These systems enable more precise decision-making in fisheries management, aquaculture techniques, and marine conservation activities by providing real-time data on ocean conditions, fish stocks, and environmental characteristics.

Increased Efficiency in Maritime Transport: The efficiency and safety of maritime transportation have significantly improved as a result of technological developments in propulsion, navigation, and ship design. In the maritime industry, automated technologies that minimise emissions, save fuel consumption, and improve overall operational efficiency include collision avoidance systems and route optimisation software.

Expansion of Aquaculture: Aquaculture operations have become more productive and have a wider reach thanks to technological advancements including genetic engineering, offshore platforms, and recirculating aquaculture systems (RAS). These developments ease issues with space constraints and water quality, lessen their negative effects on the environment, and allow for the sustainable production of seafood.

Renewable Energy Solutions: Renewable energy technologies include offshore wind, tidal energy, and wave energy have grown rapidly in the Blue Economy. The development of energy storage systems, offshore engineering, and turbine design has reduced the cost and increased the dependability of these technologies, which helps to shift the energy sector away from fossil fuels and towards clean energy.

Marine Biotechnology and Pharmaceuticals: Marine biotechnology has been shown to offer potential for use in medications, nutraceuticals, and biofuels. This has been made possible by technological developments. Explorations using bioprospecting in conjunction with genome sequencing and bioprocessing technologies have produced new chemicals and enzymes that have been found to have industrial, medicinal, and nutritional uses.

Ocean Exploration and Research: Ocean research and exploration have been transformed by the development of advanced underwater robots, remotely operated vehicles (ROVs), and autonomous underwater vehicles (AUVs). These tools give scientists the ability to map underwater environments, investigate deep-sea ecosystems, and accurately and thoroughly analyse marine biodiversity.

Blue Tech Innovation Ecosystem: A thriving ecosystem of start-ups, accelerators, and research institutes dedicated to creating novel solutions for maritime concerns has emerged as a result of the convergence of technology, entrepreneurship, and investment in the Blue Economy. Blue Tech start-ups are spearheading innovation and reshaping the Blue Economy by developing sensor technology and data analytics platforms.

To sum up, technological advancements have greatly influenced the Blue Economy by promoting sustainability, efficiency, and creativity in a variety of fields. With technology developing further, there will be new prospects for economic growth, environmental stewardship, and human well-being in the maritime sector, which will boost the Blue Economy.

2.1 Effect of ICCT including Tech-Business Analytics in the Blue economy:

The Blue Economy can benefit greatly from the application of the Integrated Coastal and Ocean Management (ICOM) method, which includes the integration of Tech-Business Analytics (TBA) and the integrated management of both the ocean and coastal zones. Some of the main consequences are as follows:

Enhanced Decision-making: Data analytics-derived insights are useful for decision-makers when TBA is integrated with ICCT (Integrated Coastal and Ocean Management). Decisions in areas like marine conservation, planning coastal development, and fisheries management can now be made

based on facts. Policies can develop more successful management plans by utilising TBA to help them comprehend the intricate relationships that exist within coastal and ocean ecosystems.

Improved Resource Management: A more sustainable and effective management of marine resources is made possible by the combination of ICCT and TBA. Stakeholders can set appropriate catch limits, optimise resource allocation, and apply ecosystem-based management approaches by accessing data on fish stocks, oceanographic conditions, and environmental characteristics. By maintaining the health of the environment, this serves to guarantee the long-term survival of fisheries and other maritime sectors.

Risk Assessment and Mitigation: For coastal and ocean hazards, TBA inside the ICCT framework provides thorough risk assessment and mitigation measures. Coastal communities can enhance their readiness for natural calamities like hurricanes, tsunamis, and sea-level rise by examining past data, creating hypothetical scenarios, and keeping an eye on current circumstances. This proactive approach to risk management lowers vulnerability to the effects of climate change and increases resilience.

Efficient Infrastructure Planning: Effective infrastructure planning and development along coastlines and in maritime areas is supported by the integration of TBA with ICCT. Planners can find good sites for ports, aquaculture facilities, renewable energy installations, and coastal protection measures by assessing geographical data, socioeconomic indicators, and environmental factors. This guarantees that infrastructure projects are sustainable both in terms of the environment and the economy.

Promotion of Blue Innovation: TBA supports ICCT in its efforts to promote entrepreneurship and innovation in the Blue Economy. Coastal communities and businesses may create creative solutions to maritime concerns by giving them access to data, technology, and market insights. To promote economic growth and sustainability in the marine industry, this involves the creation of Blue Tech start-ups, research partnerships, and technology transfer programmes.

Stakeholder Engagement and Collaboration: Collaboration and stakeholder interaction across disciplines, sectors, and jurisdictions are encouraged by ICCT. Stakeholders can collaborate to solve problems and accomplish common objectives by introducing TBA into decision-making procedures. In order to manage coastal and ocean resources more comprehensively and interestedly, this cooperative strategy encourages collaborations between government organisations, academic institutions, business, and civil society.

For this reason, the Blue Economy's resilience, sustainability, and prosperity might be greatly increased by incorporating Tech-Business Analytics within the framework of Integrated Coastal and Ocean Management. Informed decision-making, innovation, and the long-term productivity and health of coastal and marine ecosystems may all be ensured by ICCT with TBA through the use of data-driven insights and supportive stakeholder collaboration.

3. REVIEW BASED RELATED RESEARCH WORK :

This is the literature of review based on tech-business analytics in blue economy. There are ten current research papers are reviewed based on their issues and outcomes with its area.

Table 1: Tech-Business analytics in the Blue economy

S. No.	Area	Issue	Outcome	Reference
1	In the Primary Industry Sector, Tech-Business Analytics	Ensuring the sustainability and effectiveness of agricultural extraction activities is the primary industry sector's TBA. Primary sector companies can use TBA to make data-driven decisions that optimise operations and lessen environmental impact. The primary industry is highly dependent on natural resources and environmental	TBA can assist companies involved in the extraction of natural resources in streamlining their processes through the analysis of data from sensors, drones, and other sources. Businesses can discover ways to enhance resource	Kumar, S., et al. (2023). [1]

		circumstances. TBA, for instance, can assist agricultural companies in maximising crop production by the analysis of data from soil, weather, and other sensors.	efficiency, cut down on waste, and lessen the environmental effect of their operations by employing sophisticated analytics approaches.	
2	Technology-Business Analytics in the Secondary Sector	Companies across all industries—including the secondary sector—will use tech-business analytics as an essential resource. In the secondary industrial sector, tech-business analytics plays a key role in helping businesses make data-driven decisions that optimise their processes, increase productivity, and increase profitability. Companies can identify inefficiencies and potential areas for improvement in their supply chains by obtaining data on suppliers, inventory, logistics, and other factors. Businesses can utilise this data to plan maintenance ahead of time, anticipate when machinery and equipment will malfunction, and increase production by decreasing downtime.	Businesses can enhance their quality control systems by tracing the sources of problems and putting corrective measures in place by looking through data on customer complaints, product defects, and other factors. Businesses can uncover opportunities for growth and increased profitability by analysing data on consumer behaviour, industry trends, and other aspects to better target their sales and marketing efforts.	Kumar, S., et al. (2023). [2]
3	Digital Technology: Revolutionising Vegetable Farming	Vegetables are key components of Indian agriculture and nutritional security because of their short growing season, high yielding potential, rich nutritional content, economic viability, and capacity to create both on- and off-farm jobs. The expansion of vegetables in India is also fuelled by factors such as rising per capita income, urbanisation, health consciousness, the number of working women, and farmers' transition to higher-value crops. However, we are still not receiving the daily needed amount of veggies per capita. Thus, using a variety of digital technologies is the solution to expanding the output of	By lowering negative environmental effects, artificial intelligence (AI) involvement in agriculture is helping farmers increase farming efficiency. AI has been welcomed by the agriculture industry as a means of enhancing overall performance.AI is revolutionising food production, cutting emissions from the agriculture sector by 20%. Using artificial intelligence (AI) in agriculture helps regulate and mitigate	Akhter, A., et al. (2024). [3]

		different veggies. Most vegetable yields can be considerably increased by using innovative production techniques and cultivating high yielding varieties or hybrids.	any unwanted natural occurrence. Among other things, it consists of sensors, a machine learning platform, and robotic process automation.	
4	A case study of "digital nomad capital": digital nomadism as a new segment of the tourism industry.	By employing several types of information technology (IT) to operate digitally, people who practise digital nomadism can traverse the world. Within the last ten years, digital nomads have come to love destinations like Canggu, Bali, Indonesia, and Chiang Mai, Thailand. These nomads, with their distinctive qualities, are a fascinating new kind of visitor that helps local economies.	Our research reveals a range of sociocultural, economic, and technological effects as well as how Chiang Mai locals view digital nomads in contrast to other kinds of tourists.	Jiwasiddi, A., et al. (2024). [4]
5	The National Security of Ukraine is Under Public Governance. In Handbook on Ukraine's Post-War Development and Reconstruction Economics: Advancing Progress.	This chapter offers a thorough analysis of a framework designed to modify nation-building and the role of public administration in Ukraine's national security framework. Protecting the nation's national security is crucial given the dynamic geopolitical environment. Internal procedures pertaining to territorial integrity and internationally recognised borders impact how public administration activities connected to national security are carried out.	This means that, especially in light of the current crisis with the Russian Federation, it is essential to take these variables into account in addition to the systems that influence public governance of national security.	Uhodnikova, O., et al. (2024). [5]
6	A Munich case study examining the function of big businesses in entrepreneurial environments.	The importance of big businesses is a crucial question missing from studies on entrepreneurial ecosystems. That they are crucial actors is asserted. Nevertheless, the prevailing agreement, indicating that their impacts are wholly advantageous, is merely surface-level.	The effects of businesses on resource enrichment are confirmed. They have a cautious and risk-averse mind-set, nevertheless, and we also find negative effects on the entrepreneurial culture.	Herzog, S., et al. (2024). [6]
7	Improving Industry Automation with Effective Technology Management in Society.	Technology's rapid development has transformed industries all around the world and made previously unheard-of levels of automation and efficiency possible. This book offers a comprehensive	This paper offers best practices for aligning technology management with organisational goals and strategies, highlighting the need	Aithal, P. S. (2023). [7]

		analysis of the critical field of technology management and its invaluable role in coordinating the efficient automation of primary, secondary, tertiary, and quaternary businesses. Technology management encompasses a wide range of 21st-century Universal technologies, including nanotechnologies and information, communication, and computation technologies (ICCT underlying technologies).	for adaptable frameworks that may change with market conditions. The socioeconomic and environmental effects of technology-driven automation in businesses are also covered in this article, emphasising the significance of ethical and sustainable technology management.	
8	Components of incubation processes for high-tech businesses.	University incubators have been established to support the commercialization of ideas as a result of the UK government's emphasis on knowledge as a crucial differentiator in the marketplace. Despite this, there is a lack of awareness regarding the commercialization process for research ideas.	The development and upkeep of internal and external networks, and suitable exit strategies for companies departing the incubator are some of the key elements that enhance the incubation process.	Patton, D., et al. (2009). [8]
9	An examination of business plans for the US and Southeast Asian digital and online tech industries' economic growth and expansion.	The world economy is paying attention to it. Being a member of the Association of South East Asian Nations, ASEAN, has contributed to extraordinary economic growth across all regions. Simplified tariff structures, decreased and eliminated tariffs, hurdles, and restrictions have attracted a lot of foreign investors and start-ups to the ASEAN, where they have prospered (ASEAN, 2019).	Although Southeast Asia currently has its own businesses and plans for what Southeast Asians need, want, and desire, it will gladly accept the financial help of foreign investors in most circumstances.	Mezzanatto-McNair, S. (2019). [9]
10	What new function does digital technology play in the public sector following public funding?	For a long time, academics studying innovation have acknowledged that while commercialising novelty is "innovative," entrepreneurship is "imitative." As such, their skill sets are incredibly unique. First and foremost, entrepreneurship is manipulating consumer sentiment in order to maximise profits, often to the detriment	Certain interactive machine-learning services have long been available as "post social" algorithms through the latter, combined with artificial intelligence, and they cater to clients of investment banks that trade stocks and	Cooke, P. (2017). [10]

		of the market or even outright fraud in certain instances.	currencies, among other companies.	

4. OBJECTIVES BASED ON REVIEW:

(1) To evaluate the concept of Tech-Business Analytics in the blue economy.
(2) To analyse the importance of tech-business analytics in the blue economy.
(3) To review the model of Tech-business Analytics in the blue economy.
(4) To analyse and evaluate the Implications of Tech-Business Analytics in the Blue Economy.
(5) To study the Advantages, Benefits, Constraints, and Disadvantages of Tech-business Analytics in the blue economy using ABCD analysis framework.
(6) To initiate the implementation and impact of Tech -business Analytics on improving Efficiency of blue economy.

5. METHODOLOGY :

In order to support well-informed decision-making and enhance operations across a range of maritime industries, Tech Business Analytics (TBA) in the Blue Economy employs a methodical approach to data collection, processing, analysis, and interpretation. An organised approach of applying TBA in the Blue Economy is as follows:

Table 2: Methodologies of TBA in Blue economy

S. No.	Aspects	Brief About
1.	**Define Objectives and Key Performance Indicators (KPIs)**	Determine the precise aims and objectives of using TBA in the context of the Blue Economy. This could include reaching sustainability goals, boosting operational effectiveness, encouraging innovation, or better managing resources. Determine which Key Performance Indicators (KPIs) are pertinent and will be utilised to gauge the effectiveness and influence of TBA activities. These Key Performance Indicators (KPIs) can include measures like fuel consumption, revenue creation, fish stock health, or environmental impact indicators; they should also be in line with the overall objectives.
2.	**Data Collection and Integration**	Collect pertinent information from a range of sources, such as industrial partners, government agencies, academic institutions, and remote sensing technologies. Combine many data sets into a single, centralised data management system. To guarantee consistency and dependability, this may entail data cleaning, normalisation, and standardisation. Market trends, weather forecasts, satellite imaging, vessel tracking data, socioeconomic indicators, and oceanographic data are a few examples of data sources.
3.	**Data Analysis and Modelling**	Utilise sophisticated analytical methods to draw conclusions from the data, including machine learning, statistical analysis, predictive modelling, and optimisation approaches. To find out more about the possibilities for renewable energy sources, market dynamics, aquaculture methods, marine logistics, and fisheries management, look for correlations, patterns, and trends within the data. Based on historical data and pertinent variables, create predictive models to estimate future scenarios, such as the abundance of fish stocks, vessel performance, or levels of energy production.
4.	**Visualization and Reporting**	Use dashboards, reports, and interactive data visualisation tools to share insights and discoveries. Employ visual aids like heat maps, charts, graphs, and maps to convey complex information in an easy-to-understand manner. To promote decision-making and stakeholder participation, customise reports and presentations for various audiences, such as legislators, business stakeholders, academics, and the general public.

5.	**Decision Support and Implementation**	Apply the knowledge gained from TBA to help the Blue Economy's decision-making procedures. Depending on the findings of the investigation, this can entail suggesting particular courses of action, regulations, or initiatives. Work together with stakeholders to create and carry out plans for promoting innovation, increasing operational effectiveness, and optimising resource management. TBA initiatives' results are tracked and assessed against predetermined KPIs, and the approach is refined in response to input and lessons discovered.
6.	**Continuous Improvement and Adaptation**	As technology advances, new data sources, feedback, and changing business requirements are taken into account, the TBA technique should be continuously improved. Ensure that the technique stays current and useful over time by keeping up with changing trends, best practices, and advances in TBA and the Blue Economy. Encourage companies and sectors participating in the Blue Economy to embrace a culture of data-driven innovation and decision-making, and support the strategic use of TBA as a means of attaining resilience and continuous growth.

Through the use of this methodology, stakeholders within the Blue Economy can effectively leverage the potential of Tech Business Analytics to seize novel possibilities, tackle obstacles, and accomplish sustainable development objectives in coastal and marine settings [11].

6. CONCEPT OF TECH-BUSINESS ANALYTICS IN THE BLUE ECONOMY :

Using cutting-edge technologies and analytical techniques to boost productivity, spur innovation, and advance sustainability in marine-related businesses is known as tech-business analytics, or TBA, in the context of the blue economy. It blends business analytics concepts with the particular difficulties and chances that the maritime environment presents. A synopsis of TBA in the Blue Economy is provided here:

Table 3: TBA as concept in Blue economy

S. No.	Aspects	Brief About
1.	**Utilization of Data**	In order to function effectively in the Blue Economy, TBA must gather, analyse, and analyse a wide range of data sets about marine activities, environmental factors, market trends, and ocean resources. This comprises information gathered from various sources, including economic indicators, satellite photography, oceanographic sensors, vessel tracking systems, and fisheries monitoring programmes.
2.	**Data-driven Decision Making**	With the use of empirical data and data-driven insights, TBA empowers Blue Economy stakeholders to make well-informed decisions. Decision-makers in industries like fisheries management, aquaculture, maritime transportation, and renewable energy can find opportunities, reduce risks, and allocate resources most effectively by examining patterns, trends, and correlations in the data.
3.	**Optimization of Operations**	Through the identification of areas for process improvement and optimisation, TBA contributes to the enhancement of the efficacy and efficiency of operations within marine-related businesses. This could entail using predictive modelling and optimisation algorithms to maximise yield in aquaculture, minimise bycatch in fisheries, streamline port operations, optimise shipping routes, and so on.
4.	**Innovation and Product Development**	Through insights into market dynamics, consumer preferences, and future technology, TBA promotes innovation and entrepreneurship within the Blue Economy. Utilising data analytics, companies can find gaps in the market, create new goods and services, and profit from new trends like marine biotechnology, offshore renewable energy, and sustainable seafood.

5.	**Environmental Sustainability**	TBA is essential to the Blue Economy's efforts to advance environmental protection and sustainability. Through the analysis of environmental data and an evaluation of the effects of human activities on marine ecosystems, interested parties can put policies into place to reduce adverse effects, protect biodiversity, and guarantee the long-term health of the oceans and coastal regions. Through historical data analysis and scenario modelling, policymakers can formulate strategies aimed at bolstering resilience, accommodating evolving circumstances, and reducing susceptibility to external shocks.
6.	**Stakeholder Engagement and Collaboration**	Governmental agencies, business leaders, academic institutions, and civil society organisations are just a few of the stakeholders in the Blue Economy that TBA helps to collaborate and share knowledge with. TBA encourages a cooperative approach to resolving shared difficulties and accomplishing common goals by giving access to data, tools, and analytical skills.

In order to promote resilient development, innovation, and sustainable growth in the maritime and coastal sectors, the idea of Tech-Business Analytics in the Blue Economy is thus a potent instrument. Stakeholders can take advantage of new opportunities, tackle difficult problems, and guarantee the long-term sustainability of ocean resources for coming generations by utilising data and technology [12].

7. MODEL OF TECH-BUSINESS ANALYTICS IN THE BLUE ECONOMY :

The process of building a Tech-Business Analytics (TBA) model for the Blue Economy entails organising concepts, methods, and business strategies into a structured framework that addresses possibilities and problems in marine-related businesses. An outline of the essential elements and procedures needed to apply TBA in the Blue Economy can be found in the following simplified model:

Table 4: TBA as Model in Blue economy

S. No.	Aspects	Brief About
1.	**Identify Business Objectives**	Give specifics about the aims and objectives of using TBA in the context of the Blue Economy. This might involve boosting environmental sustainability, encouraging innovation, streamlining resource management, or increasing operational efficiency.
2.	**Data Acquisition and Integration**	Compile a variety of data sets from different sources, such as market databases, environmental monitoring programmes, satellite photography, oceanic sensors, and vessel tracking systems. To ensure data quality, consistency, and reliability, integrate and standardise data from many sources into a centralised data repository or data management system.
3.	**Data Analysis and Modelling**	Utilise sophisticated analytical methods to draw conclusions from the data, including machine learning, statistical analysis, predictive modelling, and optimisation approaches. To maximise decision-making in sectors like fisheries management, aquaculture techniques, maritime logistics, and renewable energy, analyse patterns, trends, and correlations within the data. This will help you uncover opportunities and reduce risks.
4.	**Visualization and Reporting**	Use dashboards, reports, and interactive data visualisation tools to share insights and discoveries. To convey complicated data in a way that is clear and intelligible and that is customised to the needs and preferences of many stakeholders, use visualisations like charts, graphs, maps, and heat maps.

5.	**Decision Support and Implementation**	Make use of the TBA's insights to assist decision-making in the maritime industries. Utilising the findings of the analysis, work with stakeholders to create and execute plans for enhancing operations, spurring creativity, and accomplishing sustainability objectives.
6.	**Monitoring and Evaluation**	Using predetermined Key Performance Indicators (KPIs) and targets, track and assess the results of TBA activities. For continual development and alignment with corporate objectives, monitor progress over time, pinpoint problem areas, and modify techniques and tactics as necessary.
7.	**Knowledge Sharing and Collaboration**	Encourage communication and cooperation between government agencies, business enterprises, academic institutions, and civil society organizations—all of whom are key actors in the Blue Economy. To maximise group knowledge, resources, and best practices in TBA implementation, promote cooperation through conferences, workshops, and information-sharing websites.
8.	**Capacity Building and Training**	To give stakeholders the abilities and information they need to use TBA tools and processes efficiently, provide training and capacity-building programmes. Develop a culture of data-driven innovation and ongoing learning within the Blue Economy by enabling stakeholders to become skilled in data analysis, interpretation, and decision-making.

Coastal and marine-related sectors can achieve sustainable growth and resilience by utilising Tech-Business Analytics to solve obstacles and open up new opportunities. This model can be adopted by stakeholders in the Blue Economy.

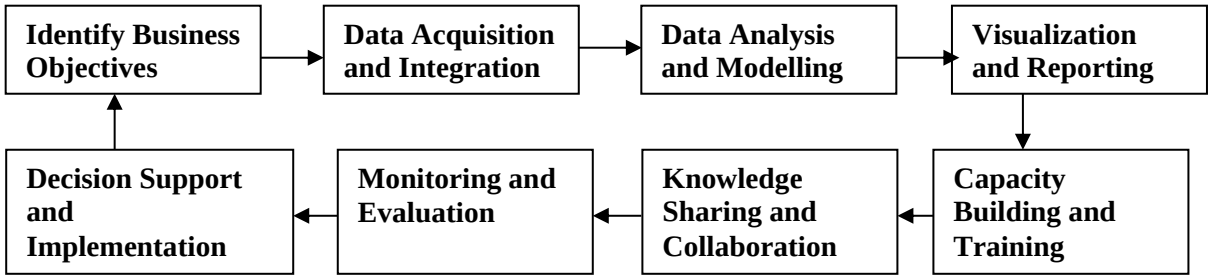

Fig. 1: Block diagram of TBA in Blue Economy

The block diagram on tech business analytics in blue economy are based on identify the business objectives then it is integrating the data acquisition in next step it is doing the data analysis and predict a model then it is doing visualization and reporting, it is again having capacity building and training, Knowledge sharing ad collaboration are required here then monitoring and evaluation with decision support and implementation of the model [13].

8. TO ANALYSE AND EVALUATE THE IMPLICATIONS OF TBA IN THE BLUE ECONOMY :

Using technology-driven methods to analyse data and extract insights for well-informed business choices is known as tech business analytics, or TBA. TBA can have a number of effects when it comes to the Blue Economy.

Table 5: Implications of TBA in Blue economy

S. No.	Aspects	Brief About
1.	**Resource Management**	The management of ocean resources can be made more sustainable and effective with TBA. Fisheries and aquaculture stakeholders can make more informed judgements about harvesting methods, stocking

		densities, and ecosystem protection strategies by accessing data on fish stocks, ocean currents, weather patterns, and other pertinent elements.
2.	**Supply Chain Optimization**	In the context of the Blue Economy, TBA can streamline supply chains, cutting waste and enhancing logistics. For instance, businesses may guarantee product quality, minimise spoilage, and lower their carbon footprint by employing sensors and data analytics to follow the movement of seafood from the site of capture to the consumer.
3.	**Market Intelligence**	Businesses in the marine industry can benefit greatly from the market intelligence that TBA can offer. Businesses can find new business possibilities, create focused marketing campaigns, and modify their goods and services to satisfy changing market demands by evaluating consumer preferences, market trends, and rival activity.
4.	**Risk Management**	Operating in the Blue Economy has certain risk, which TBA can assist reduce. Businesses can protect their operations and assets by anticipating and preparing for possible interruptions through the analysis of data on variables like weather, regulatory changes, and geopolitical developments.
5.	**Environmental Monitoring and Compliance**	TBA can assist with Blue Economy environmental compliance and monitoring initiatives. Regulators can identify and handle problems like pollution, overfishing, and habitat destruction by analysing data from sensors, satellites, and other sources. This allows them to enforce rules and encourage sustainable activities.
6.	**Innovation and Investment**	In the Blue Economy, TBA can stimulate investment and innovation. Analytics may stimulate the creation of new goods, services, and infrastructure by supplying information on market prospects, technology developments, and developing trends. This information can be used to help firms, governments, and investors make strategic decisions.
7.	**Capacity Building and Collaboration**	TBA can help stakeholders in the Blue Economy become more collaborative and capable. Through the exchange of information, resources, and skills, groups can improve their joint comprehension of maritime environments and work together to address common problems, promoting sustainability and resilience.

The Blue Economy thus stands to benefit greatly from TBA's consequences, which present chances to improve resilience, sustainability, and efficiency in a number of areas. However, in order to fully reap these advantages, investments in data infrastructure, technology adoption, and the development of human ability are needed. Additionally, the ethical, legal, and societal consequences must be carefully considered. Stakeholders can protect coastal communities and ocean habitats for future generations while realising the full benefits of the Blue Economy by utilising TBA efficiently [14].

9. ABCD ANALYSIS FRAMEWORK ON TECH-BUSINESS ANALYTICS IN THE BLUE ECONOMY:

A systematic analysis of the advantages, benefits, constraints and disadvantages of applying an analysis framework for Tech-Business Analytics (TBA) in the Blue Economy is performed as per ABCD analysis framework [15-16] model. ABCD analysis framework consists of (1) ABCD listing [17-78], (2) ABCD stakeholders' analysis [80-92], (3) ABCD factors and elementary analysis [93-98], and (4) ABCD quantitative analysis [99-119]. In this section contains ABCD listing analysis of tech-business analytics in the blue economy.

Advantages:

This is the table for advantages of tech business analytics in blue economy on different aspects and its brief structure.

Table 6: Advantages of TBA in Blue economy

S. No.	Aspects	Brief About
1.	**Informed Decision Making**	With the help of TBA's insightful data analysis, stakeholders may make wise decisions about resource management, operational optimisation, and strategic planning in the Blue Economy.
2.	**Efficiency and Productivity**	TBA can increase productivity and efficiency in the marine industry, which will save costs and improve performance. It does this by streamlining operations, finding bottlenecks, and optimising procedures.
3.	**Sustainability**	Through ecosystem health monitoring, data analysis, and opportunity identification for conservation and stewardship in the Blue Economy, TBA helps to make sustainable practices easier to adopt.
4.	**Innovation and Competitiveness**	Through the identification of customer preferences, market trends, and upcoming technologies, TBA promotes entrepreneurship and innovation, enabling firms to create cutting-edge goods and services and sustain a competitive advantage in the global economy.
5.	**Risk Management**	In order to improve resilience and adjust to shifting circumstances in the Blue Economy, TBA assists stakeholders in evaluating and reducing risks related to natural disasters, climate change, and economic volatility.

Benefits:

The table 7 lists the benefits of tech business analytics in blue economy on different aspects along with their descriptions.

Table 7: Benefits of TBA in Blue economy

S. No.	Key benefits	Descriptions
1.	**Data-Driven Decision Making**	Businesses operating in the blue economy are able to gather, examine, and evaluate data from a variety of sources thanks to an analysis framework. Strategic planning and resource allocation become more effective when data-driven decision-making based on real-time insights is employed.
2.	**Optimized Resource Management**	Businesses in the blue economy can optimise their resource management techniques by analysing data on marine ecosystems, weather patterns, oceanic resources, and market trends. This covers ethical tourism management, effective energy production from ocean renewables, and sustainable fishing methods.
3.	**Risk Mitigation**	For a business to remain sustainable, it is essential to comprehend the risks involved in operating in the blue economy. Businesses can build proactive plans to reduce risks and improve resilience by using an analysis framework to detect prospective risks such market swings, regulatory changes, and environmental concerns.
4.	**Market Opportunity Identification**	Businesses can find new market possibilities and specialised markets by analysing market trends and customer behaviour within the blue economy. An analysis framework can offer insightful information on unrealized market potential for any company, be it one that is manufacturing eco-friendly products, developing novel marine technology, or providing distinctive marine-based experiences.
5.	**Environmental Impact Assessment**	Reduce your environmental impact, please, as businesses in the blue economy are required to do. Businesses are able to evaluate and track their ecological footprint and find areas where they can improve, such waste reduction, pollution prevention, and habitat protection, with the help of an analysis framework that can enhance environmental impact evaluations.

6.	**Performance Evaluation and Continuous Improvement**	Key performance indicators (KPIs) and performance metrics can be routinely monitored by firms with the help of an analysis framework. Businesses are able to continuously improve operational efficiency and competitiveness by identifying areas for improvement and putting corrective actions in place by monitoring progress against predetermined benchmarks and targets.
7.	**Stakeholder Engagement and Collaboration**	A wide range of stakeholders are involved in the blue economy, including local communities, government agencies, research institutes, and environmental groups. In order to create more transparent and inclusive governance frameworks, an analysis framework can help stakeholders participate and collaborate by offering a shared platform for data exchange, communication, and decision-making.
8.	**Innovation and Technological Advancement**	It is possible to stimulate innovation and technical progress in the blue economy by utilising data analytics and cutting-edge technologies like machine learning, artificial intelligence, and the Internet of Things (IoT). In order to tackle new difficulties and seize opportunities, an analysis framework offers a foundation for trying out novel technologies, scaling up profitable projects, and piloting creative solutions.

Constraints:

The table 8 lists the constraints of tech business analytics in blue economy along with descriptions.

Table 8: Constraints of TBA in Blue economy

S. No.	Key Constraints	Description
1.	**Data Quality and Availability**	The quality and availability of data is one of the main problems in TBA. The efficacy of analysis and decision-making in the Blue Economy may be restricted in certain instances by inadequate, outdated, or untrustworthy data.
2.	**Technological Infrastructure**	Strong technology infrastructure, including data processing, storage, and analysis tools, is needed to implement TBA. Stakeholders may face difficulties due to limited access to technology and experience, especially in underdeveloped countries with poor infrastructure.
3.	**Skills and Expertise**	Specialised knowledge and proficiency in data analysis, statistics, programming, and the Blue Economy domain are required for TBA positions. TBA projects may not be adopted or implemented as planned if there is a lack of qualified personnel and training opportunities.
4.	**Privacy and Security Concerns**	Concerns around data protection, security, and privacy are brought up by the usage of data in TBA. To guarantee the ethical use and treatment of sensitive data in the Blue Economy, stakeholders need to abide by legal and ethical obligations.
5.	**Cost and Investment**	Technology, infrastructure, and human capital investments are necessary for the expensive and resource-intensive implementation of TBA projects. The implementation of TBA within the marine industry may be hampered by competing agendas and limited financial resources.

Disadvantages:

The table 9 lists some of the disadvantages of tech business analytics in blue economy with their descriptions.

Table 9: Disadvantages of TBA in Blue economy

S. No.	Key disadvantages	Description
1.	**Data Limitations**	It can be quite difficult to find thorough and trustworthy statistics in the blue economy. A large amount of information about ocean resources, ecosystems, and associated economic activity might be missing, out-of-date, or hard to find.
2.	**Complexity of Ecosystems**	The term "blue economy" refers to a broad category of businesses and sectors, such as renewable energy, tourism, shipping, and fishing. It can be difficult and possibly require elaborate analytical models to analyse the relationships and interdependencies within this intricate ecosystem.
3.	**Environmental Impact Assessment**	There can be major environmental consequences to a lot of the blue economy's actions. It takes specialised knowledge and data to effectively analyse these impacts, and failing to take environmental elements into account can have detrimental effects on communities and ecosystems.
4.	**Regulatory and Policy Challenges**	Both domestically and globally, the blue economy is governed by a wide range of laws and rules. Decision-making and analysis may face difficulties when navigating these regulatory frameworks and guaranteeing compliance.
5.	**Technological Limitations**	Having access to specialised infrastructure and technology, such as satellite imaging, underwater sensors, remote sensing, and data processing skills, may be necessary for implementing advanced analytics in the blue economy. Restrictions on access to these tools may compromise the analytical framework's efficacy.
6.	**Human Capital**	It might be difficult to develop and retain expertise in both the blue economy and technology. It could be challenging to get qualified experts who comprehend the nuances of the blue economy as well as the technical parts of analytics.
7.	**Privacy and Security Concerns**	Concerns about privacy and security may arise when sensitive data on marine activities, coastal communities, or oceanic resources is analysed. Although it can make the analytical process more difficult, protecting data and making sure privacy laws are followed are crucial.
8.	**Cost and Resource Constraints**	Large financial and human resources may be needed for the development and implementation of an analysis framework for tech-business analytics in the blue economy. Companies may not be able to invest as much in these projects due to competing priorities or budgetary restrictions.

Therefore, even if there are obstacles and limitations to putting an analysis framework for TBA into practice in the Blue Economy, the potential gains and advantages—such as competitiveness, efficiency, sustainability, informed decision-making, and efficiency—outweigh the disadvantages. Through tackling these obstacles and capitalising on the chances offered by TBA, interested parties can uncover fresh prospects and promote enduring expansion and advancement within the Blue Economy [15].

10. IMPLEMENTATION, AND IMPACT OF TECH -BUSINESS ANALYTICS ON EFFICIENCY THE BLUE ECONOMY :

Using cutting edge technology and analytical techniques to optimise workflows, streamline operations, and boost productivity across many maritime industry sectors is known as Tech-Business Analytics (TBA) implementation, which aims to improve efficiency in the Blue Economy. The following are some ways that TBA can be used to boost productivity in the Blue Economy:

Table 10: Implementation and Impact of TBA in Blue economy

S. No.	Key Impact	Description
1.	**Supply Chain Optimization**	Transform supply chain operations by using TBA to examine shipping routes, port operations, and logistical procedures in order to find inefficiencies. Reduced transportation costs, less delays in maritime transportation, and improved inventory management are all possible using predictive analytics.
2.	**Resource Management**	In industries like aquaculture and fisheries, TBA can be used to maximise resource allocation and use. Stakeholders can optimise stocking densities, carry out sustainable harvesting procedures, and maximise production while minimising waste and environmental effect by analysing data on fish stocks, ocean conditions, and market demand.
3.	**Energy Efficiency**	To find chances to increase energy efficiency in renewable energy projects and maritime operations, use TBA. To maximise energy use, lower emissions, and improve the Blue Economy's overall environmental sustainability, analyse data on fuel use, vessel performance, and the production of renewable energy.
4.	**Process Automation**	In the marine industry, use TBA-driven process automation systems to expedite data entry, workflow management, and administrative chores. Organisations can enhance their operational efficiency, minimise manual errors, and free up resources for more strategic endeavours by utilising machine learning algorithms to automate repetitive processes.
5.	**Predictive Maintenance**	For maritime assets like ships, offshore platforms, and aquaculture infrastructure, use TBA to put predictive maintenance ideas into practice. Organisations may proactively schedule maintenance tasks, save downtime, and increase the lifespan of vital assets by evaluating equipment performance data and spotting early warning indicators of possible breakdowns.
6.	**Market Intelligence**	Use TBA to examine customer preferences, market trends, and the Blue Economy's competitive environment. To remain competitive in the global economy, organisations can uncover new opportunities, create focused marketing strategies, and make data-driven decisions by collecting and evaluating market data.
7.	**Risk Management**	Assess and reduce risks related to climate change, natural disasters, and swings in the economy with TBA. Organisations can create risk management strategies, put backup plans into place, and increase resilience to external shocks by evaluating historical data and modelling possible scenarios.
8.	**Collaboration and Integration**	Encourage cooperation and integration between Blue Economy stakeholders by utilising TBA-driven decision support tools and data exchange platforms. Organisations can optimise resource allocation across many sectors and jurisdictions, coordinate activities, and improve information exchange by granting access to real-time data and analytics tools.

Consequently, there are several advantages to using Tech-Business Analytics to boost productivity in the Blue Economy, including reduced costs, increased environmental sustainability, enhanced productivity, and a competitive edge. Organisations may enhance operations, maximise resource utilisation, and propel sustainable growth in marine-related businesses by utilising data-driven insights and cutting-edge technologies.

10.1 Implementation of Tech-Business in the Blue economy:

Using innovative technology, analytical techniques, and business strategies in a methodical manner to solve problems and seize opportunities in the marine industry is known as Tech-Business Analytics (TBA) implementation in the Blue Economy. Using TBA in the Blue Economy can be done in the following steps as presented in table 11:

Table 11: Implementation of TBA in Blue economy

S. No.	Key Issues	Description
1.	**Assess Needs and Objectives**	Determine the precise requirements, difficulties, and opportunities in the Blue Economy that TBA could address. This could entail encouraging innovation, improving operational effectiveness, managing resources optimally, or advancing sustainability.
2.	**Build Stakeholder Support**	To increase support for TBA activities, involve important stakeholders such as government agencies, business leaders, academic institutions, and neighbourhood associations. To guarantee alignment with common aims and objectives, encourage cooperation and communication among stakeholders.
3.	**Develop Data Strategy**	Provide a thorough data strategy that describes the many kinds of data required, as well as the sources, techniques, governance guidelines, and infrastructure for data management needed to support TBA activities in the Blue Economy.
4.	**Invest in Technology Infrastructure**	To support TBA activities, make the appropriate investments in hardware, software, and analytical tools. This can entail putting in place platforms for predictive analytics, cloud computing services, data visualisation tools, and data processing and storage capabilities.
5.	**Acquire and Integrate Data**	Grab a variety of data sets from different sources, such as market databases, environmental monitoring programmes, satellite photography, oceanic sensors, and vessel tracking systems. Transfer and unify information from several sources into a central data repository or data management system.
6.	**Build Analytical Capabilities**	Recruiting or educating data scientists, analysts, and subject matter experts with experience in TBA approaches and techniques would help the company enhance its analytical skills. Encourage an environment where the organisation makes decisions based on facts and is always learning.
7.	**Implement Analytical Models**	Employ analytical models and algorithms to examine data, spot trends, patterns, and correlations, and extract useful information that can guide Blue Economy decision-making. Statistical analysis, machine learning, predictive modelling, and optimisation approaches may be used in this.
8.	**Visualize and Communicate Insights**	Share knowledge and discoveries from TBA projects with others by using dashboards, reports, and interactive data visualisation tools. Employ visual aids like heat maps, charts, graphs, and maps to convey complicated data in a way that is both clear and comprehensible and meets the demands of many stakeholders.
9.	**Support Decision Making and Action**	Give stakeholders useful information and suggestions based on TBA analysis to aid in decision-making processes in the marine industry. Work together with stakeholders to create and put into action plans that will streamline operations, spur creativity, and meet sustainability objectives.
10.	**Monitor and Evaluate Performance**	Determined Key Performance Indicators (KPIs) and objectives are used to track and assess the effectiveness and impact of TBA efforts. For continual development and alignment with corporate objectives, monitor progress over time, pinpoint problem areas, and modify techniques and tactics as necessary.

11.	**Promote Knowledge Sharing and Collaboration**	By offering chances for networking, training, and knowledge exchange, promote a culture of cooperation and knowledge sharing among Blue Economy players. In order to maximise group knowledge and resources for TBA implementation, encourage cooperation through workshops, seminars, and joint initiatives.

The implementation of Tech-Business Analytics efforts by Blue Economy stakeholders can foster resilience, innovation, and sustainable growth in the maritime and coastal industries by adhering to these guidelines.

10.2 Impact of Tech-Business in the Blue economy:

Tech-Business projects have a significant and diverse impact on the Blue Economy, providing a number of advantages in a number of fields. Among the main effects are listed in following table 12:

Table 12: Impact of TBA in Blue economy

S. No.	Key Impact	Description
1.	**Efficiency and Productivity**	Marine-related industries experience higher production and efficiency when Tech-Business solutions are used. Cost savings, faster turnaround times, and better resource use are the outcomes of process optimisation, task automation, and operational streamlining.
2.	**Sustainability**	In order to promote sustainability within the Blue Economy, tech-business solutions are essential. Stakeholders may improve resource management techniques, reduce their negative effects on the environment, and promote the preservation of marine ecosystems by utilising data analytics and technological advancements.
3.	**Innovation**	Innovation is sparked and new products, services, and technologies are developed in the Blue Economy through Tech-Business projects. Businesses can find market possibilities, meet unmet demands, and develop cutting-edge solutions to maritime problems by utilising data-driven insights.
4.	**Competitiveness**	Businesses who use Tech-Business tactics have an advantage over rivals in the international market. Businesses can outperform their rivals in decision-making, operational efficiency, and ability to adjust to shifting market conditions by utilising cutting-edge technologies and analytical tools.
5.	**Resilience**	The ability of marine-related sectors to withstand shocks and disturbances from outside sources is improved by tech-business solutions. In order to lessen the effects of natural disasters, climate change, and economic changes, stakeholders can foresee risks, create backup plans, and modify their strategies by utilising data analytics and predictive modelling.
6.	**Environmental Monitoring and Protection**	Improved monitoring and protection of marine habitats are made possible by tech-business activities. In order to address pollution, habitat degradation, and overfishing, real-time monitoring of water quality, biodiversity, and habitat health is made possible by remote sensing technology, Internet of Things devices, and data analytics platforms.
7.	**Policy and Decision Making**	Lawmakers and regulators may make informed decisions and build policies based on facts by using the insightful data that tech-business analytics offer. Legislators can create more effective laws and policies to support conservation and sustainable development in the Blue Economy by examining data on environmental indicators, economic trends, and marine resource availability.
8.	**Capacity Building and Collaboration**	Innovations in technology and business foster cooperation and capacity growth among Blue Economy participants. Organisations can cooperate to solve shared issues, promote innovation, and advance

		group action for the benefit of coastal communities and marine ecosystems by exchanging information, knowledge, and best practices.

Because of this, tech-business has a revolutionary effect on the blue economy, promoting resilience, innovation, and sustainable growth while aiding in the preservation and wise use of marine resources for coming generations [16].

11. ABCD ANALYSIS OF INTEGRATION OF TBA WITH ICCT UT IN THE BLUE ECONOMY:

The impact of programmes or tactics is frequently assessed using the ABCD analytical methodology. Let us apply it to the blue economy's tech-business analytics (TBA) and integrated coastal and ocean management (ICCT) as presented in table 13:

Table 13: Integration of TBA in Blue economy

S. No.	Key Issues	Description
Advantages:		
1	**Improved decision-making**	The blue economy's resource management, policy creation, and strategy planning can all be influenced by the data-driven insights that the integration of TBA with ICCT offers decision-makers.
2	**Enhanced efficiency**	Within marine-related sectors, TBA helps optimise operations and streamline processes, resulting in enhanced production, cost savings, and efficiency.
3	**Sustainability**	In order to monitor and manage marine resources, reduce environmental impact, and enhance ecosystem health, the combined strategy uses technology and analytics to assist sustainable development and conservation.
4	**Innovation**	Through market possibilities identification, research and development support, and the acceleration of the adoption of new technologies and practices in the blue economy, the integration of TBA with ICCT contributes to innovation and entrepreneurship.
Benefits:		
1	**Resource optimization**	Better fisheries management, aquaculture techniques, and coastal development planning are made possible by the integration of TBA with ICCT, which allows for optimal resource allocation and utilisation.
2	**Risk mitigation**	TBA improves the resilience of coastal communities and marine ecosystems by assisting in the identification and mitigation of risks related to natural calamities, climate change, and economic volatility.
3	**Stakeholder engagement**	More efficient decision-making and initiative execution result from the integrated approach's facilitation of knowledge sharing and collaboration among stakeholders, which includes government agencies, business leaders, academic institutions, and civil society organisations.
4	**Policy support**	In order to support the development of evidence-based policies and initiatives that support sustainable growth and conservation in the blue economy, TBA offers regulators and policymakers insightful information.
Constraints:		
1	**Data challenges**	The interoperability, quality, and availability of data may provide difficulties for TBA integration with ICCT. Analysis and decision-making in the blue economy might be hampered by incomplete or untrustworthy data sources.

2	**Technological infrastructure**	The absence of sufficient technological infrastructure and knowledge in emerging regions might present obstacles for stakeholders due to limited access to technology.
3	**Cost and investment**	The costs associated with implementing TBA programmes in some organisations and areas may be prohibitive because to the need for expenditures in infrastructure, technology, and human capital.
4	**Policy and regulatory barriers**	It's possible that the integration of TBA with ICCT is not fully supported by the laws and regulations in place, necessitating changes and revisions to make it possible to adopt and apply data-driven strategies in the blue economy.
Disadvantages :		
1	**Overreliance on technology**	An over-reliance on technology and data analytics runs the risk of undervaluing the value of conventional wisdom, community involvement, and all-encompassing methods of managing the shore and ocean.
2	**Data privacy and security concerns**	Concerns surrounding data privacy, security, and governance are brought up by the integration of TBA with ICCT especially in light of the gathering, sharing, and use of sensitive data in the blue economy.
3	**Capacity building needs**	Especially in regions with little access to technical knowledge and educational resources, stakeholders might need more training and capacity-building programmes in order to properly use TBA and ICCT tools and techniques.
4	**Resistance to change**	The adoption and application of integrated TBA and ICCT approaches in the blue economy may be hampered by organisational and institutional inertia and reluctance to change.

In order to fully realise its potential in fostering sustainable growth, innovation, and resilience in coastal and marine-related industries, the integration of tech-business analytics with integrated coastal and ocean management in the blue economy must address a number of obstacles and drawbacks [120-122].

12. FINDINGS IN TERMS OF POSTULATES & SUGGESTIONS :

Ideologies and recommendations for executing Tech-Business projects in the Blue Economy are as follows:

Postulates:

Data-Driven Decision Making: The idea behind integrating Tech-Business Analytics (TBA) with the Blue Economy is that better decision-making stems from data-driven insights, which in turn spurs innovation and sustainable growth in marine-related companies.

Interdisciplinary Collaboration: Collaboration and integration within the fields of technology, business, environmental research, policy, and community participation are necessary for the successful implementation of Tech-Business initiatives in the Blue Economy.

Continuous Innovation: With stakeholders utilising cutting-edge technologies, analytical techniques, and entrepreneurial approaches to solve changing challenges and opportunities, tech-business in the blue economy thrives on ongoing innovation.

Sustainable Development: In order to maintain the long-term sustainability of marine resources and coastal communities, tech-business in the blue economy places a strong emphasis on sustainable development, which strikes a balance between economic growth, environmental preservation, and social fairness.

Suggestions:

Investment in Technology and Infrastructure: To support the execution of Tech-Business activities in the Blue Economy, governments, companies, and research institutions should give priority to investments in data management systems, analytical tools, and technology infrastructure.

Capacity Building and Training: A training programme and capacity-building project should be funded by Blue Economy stakeholders in order to provide people and organisations the know-how to properly use TBA.
Collaborative Partnerships: To promote information sharing, resource pooling, and group action in the implementation of Tech-Business solutions, establish cooperative relationships among governmental organisations, business entities, academic institutions, non-governmental organisations, and local communities.
Policy and Regulatory Support: Through the establishment of favourable laws, rules, and incentives that promote investment, entrepreneurship, and the prudent use of marine resources, policymakers and regulators may foster Tech-Business innovation in the Blue Economy.
Community Engagement: Involve local stakeholders and communities in the creation and execution of Tech-Business projects, making sure that the solutions are inclusive of a range of needs and viewpoints, culturally sensitive, and pertinent to the current situation.
Monitoring and Evaluation: Create systems to measure success, pinpoint areas for improvement, and provide guidance for adaptive management methods. Use Key Performance Indicators (KPIs) to evaluate the influence of Tech-Business activities in the Blue Economy.
Knowledge Sharing and Communication: Encourage a culture of cooperation, learning, and innovation in the Blue Economy by promoting information exchange and communication among stakeholders through venues like workshops, conferences, publications, and online forums.
Stakeholders in the Blue Economy can leverage the transformative power of Tech-Business to promote innovation, promote sustainable development, and strengthen resilience in industries associated to the coast and sea by adopting these postulates and putting these recommendations into practice [122].

13. CONCLUSION :

To sum up, incorporating Tech-Business projects into the Blue Economy is a revolutionary way to tackle issues and take advantage of chances in the marine sector. Coastal and ocean ecosystems can be made more resilient, innovative, and driven by stakeholders through the use of cutting-edge technologies, data analytics, and entrepreneurial tactics. Adoption of tech-business solutions facilitates communication amongst various stakeholders, allows for informed decision-making, increases productivity and efficiency, and supports environmental sustainability. Nevertheless, in order to fully realise the promise of Tech-Business in the Blue Economy, funding for technological infrastructure, capacity building, joint ventures, supportive legislation, and community involvement are all necessary. Stakeholders may open up new possibilities and build a more affluent and sustainable future for coastal communities and marine ecosystems by working together and committing to responsible management [123].

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