Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector

Sachin Kumar [1], Hirdesh Sharma [2] & P. S. Aithal [3]

[1] Associate Professor, 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] Assistant Professor, Dept. of CSE, Dronacharya Group of Institutions, Greater Noida, U.P., India, ORCID ID: 0000-0002-1278-4135, Email: hirdesharma@gmail.com

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

Area/Section: Emerging Technology.
Type of Paper: Exploratory Research.
Number of Peer Reviews: Two.
Type of Review: Peer Reviewed as per |C|O|P|E| guidance.
Indexed in: OpenAIRE.
DOI: https://doi.org/10.5281/zenodo.16742398
Google Scholar Citation: PIJPL

How to Cite this Paper:
Kumar, S., Sharma, H. & Aithal, P. S. (2025). Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector. *Poornaprajna International Journal of Emerging Technologies (PIJET), 2*(2), 1-20. DOI: https://doi.org/10.5281/zenodo.16742398

Poornaprajna International Journal of Emerging Technologies (PIJET)
A Refereed International Journal of Poornaprajna Publication, India.

Received on: 04/04/2025
Published on: 06/08/2025

© With Authors.

This work is licensed under a Creative Commons Attribution-Non-Commercial 4.0 International License subject to proper citation to the publication source of the work.
Disclaimer: The scholarly papers as reviewed and published by Poornaprajna Publication (P.P.), India are the views and opinions of their respective authors and are not the views or opinions of the PP. The PP disclaims of any harm or loss caused due to the published content to any party.

Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector

Sachin Kumar [1], Hirdesh Sharma [2] & P. S. Aithal [3]

[1] Associate Professor, 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] Assistant Professor, Dept. of CSE, Dronacharya Group of Institutions, Greater Noida, U.P., India, ORCID ID: 0000-0002-1278-4135, Email: hirdesharma@gmail.com

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

ABSTRACT

Purpose: *The principal objective is to revolutionize conventional manufacturing and production procedures by utilizing cutting-edge technologies and insights derived from data. In the secondary sector, the incorporation of tech-business analytics promotes competitive advantage, long-term sustainability, and more intelligent decision-making.*

Design/Methodology/Approach: *Collect information from a range of sources, including sensors, IoT devices, ERP systems, and consumer reviews in production processes. Combine information from several systems and departments into a single platform to guarantee consistency and accuracy in analysis. Utilize methods like AIML, predictive analytics etc. monitoring to spot trends, inefficiencies, and opportunities. Utilize insights to create innovative solutions that go against the grain, such automated processes, smart factories, or customized production lines. Prior to full implementation, test new models or technologies on a small scale to assess their viability, performance, and return on investment. Successful innovations should be expanded throughout operations, integrated with current systems, and staff members should be trained for adoption. Create feedback loops with analytics to track results and keep improving procedures and inventions. This methodology aligns technology with secondary sector business objectives and guarantees that disruption is data-driven, strategic, and sustained.*

Findings/Result: *Predictive maintenance and automation greatly cut down on resource waste and downtime. Budget allocation is enhanced and production expenses are reduced through data-driven decision-making. Faster defect detection and repair are made possible by real-time analytics. Agile manufacturing techniques provide more rapid reaction to market demands. Businesses that use tech-business analytics do better in terms of innovation and agility than traditional players. Energy-efficient and environmentally friendly activities are enhanced by intelligent resource management.*

Originality/Value: *Tech-business analytics-based disruptive developments in the secondary industrial sector are distinctive due to a number of significant variables. These characteristics show that disruptive innovations that use tech-business analytics are not just improvements on existing practices, but are, in fact, new techniques that create value and establish new industry norms.*

Type of Paper: *Exploratory Research.*

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

1. INTRODUCTION :

Innovations in this area, or manufacturing sector, have been crucial to economic growth and improved production techniques [1-5]. The differences between these inventions will be determined by the industry; however, some common trends and examples are as follows:

Bank business paradigms are being profoundly disrupted by fintechs. Despite the apparent advantages, there is still a lack of research in this field from high-income transition economies. By using a drop/pick-up survey questionnaire given to a sample of all 68 UAE-Federation of Bank members, the study takes advantage of this gap. According to the results, digital technology is changing the banking ecosystem from traditional competitive models to cutting-edge bank-to-Fin-Tech collaborative models. This is because traditional banking is being disintermediated into smaller, multi-modal, and multi-directional models, creating previously unheard-of opportunities, particularly for international banks from developed economies (Sibanda et al. (2020). [1]). In contemporary manufacturing, artificial intelligence (AI) has emerged as a key transformation that offers special chances to enhance operational effectiveness and business analytics. This study uses data from a poll of 300 industry specialists to analyze the trends, advantages, and difficulties of AI adoption in US industrial sectors. By examining the operational results of increased productivity, lower costs, more revenue, and workforce optimization, specific AI applications such process automation, supply chain optimization, and predictive analytics are first examined (Hossain et al. (2024). [2]). Research examining the use, results, and strategic implications of business analytics were the focus of the inclusion criteria, while research published prior to 2018 or outside the purview of emerging markets, non-peer reviewed sources, and non-English literature were filtered out. Business analytics greatly improves strategic decision-making, operational effectiveness, and innovation, according to key results, giving emerging market businesses a strong basis for maintaining competitive advantage. The study highlights how crucial data-driven insights are to changing organizational operations and strategies. The full benefits of corporate analytics may be hampered by issues including data protection, security, and the lack of digital skills (Komolafe et al. (2024). [3]). By leveraging the difficulties of "Agrifood-Tech" business models in the digital sphere, promoting innovation, quickening institutional and structural change, increasing productivity, and launching new goods and services, the agribusiness sector exhibits excellent growth and sustainability prospects. This study aims to examine several "Agrifood-Tech" digital models and assess their function in the agribusiness and agrifood industries (Vlachopoulou et al. (2021). [4]). Comparing emerging disruptive technology to traditional enterprises, this study demonstrates the competitive advantage of legal services. In order to do this, the current study found a number of trends in the development of the legal tech market, including shifting legal business landscapes, delivery models, legal market segments, and disruptive technologies. Additionally, qualitative content analysis was carried out to give solid foundations for cost-benefit analysis. The financial, social, and psychological costs and advantages of legal technologies and traditional companies are also compared from the perspectives of clients and attorneys using cost-benefit analysis. The current body of research has really overlooked this. In light of these findings, a new legal business model has emerged that illustrates the potential for improvements in legal procedures (Hongdao et al (2019). [5]). Table 1 lists some of the innovations in the secondary industry sector.

Table 1: About innovations in the secondary industry sector

S. No.	Aspects	Description
1.	**Robots and Automation**	Largest manufacturing advancements has come from the combination of automation and robotics. Because modern robotic systems can do jobs fast and precisely, they can increase production and reduce labor expenses. Cobots are bots that work alongside people with the goal of further enhancing productivity and safety.
2.	**Additive Manufacturing (3D Printing)**	3D printing has revolutionized product design and prototyping. It allows producers to develop complex, customized parts and products with reduced waste, faster lead times, and the ability to build on demand. This technique has applications in many different areas, such as the automotive, healthcare, and aerospace sectors.
3.	**Internet of Things**	It has been used by improve manufacturing processes, resulting in "smart factories." Connected gadgets and sensors collect real-time data on

		inventory levels, equipment operation, and other subjects. Higher-quality products, reduced downtime, and improved operations can all result from the analysis of this data.
4.	**Advanced Materials**	The development of new materials with better properties has made it possible to create products that are stronger, lighter, and more resilient. For example, carbon fiber composites have been used in the automotive and aerospace industries to create lighter and more fuel-efficient automobiles.
5.	**Energy Efficiency**	These days, sustainable industrial practices are crucial. Among the cutting-edge energy-efficient practices and technologies that help reduce energy use and its detrimental impacts on the environment are heat recovery systems, HVAC systems, and energy-efficient lighting.
6.	**Supply Chain Integration**	Supply chain management advancements have improved efficiency, traceability, and risk management for the secondary business.
7.	**Artificial Intelligence (AI)**	AI is used in predictive maintenance, demand forecasting, and quality assurance.
8.	**AR & VR**	AR & VR enable staff members to see complex processes and interact with digital models in real time.
9.	**Customization and Personalization**	Customized and personalized items are becoming available from many producers. Customers can modify products to their preferences through mass customization, while still benefiting from the efficiency of mass production.
10.	**Circular Economy Initiatives**	Manufacturers are searching for strategies to reduce waste and promote recycling and material reuse. Creating items that are recyclable, manufacturable, and dismantled is part of this.
11.	**Advanced Data Analytics**	Big data analytics tools are used to examine consumer preferences, production processes, and the supply chain. Data can be used to optimize processes and make decisions.
12.	**Nanotechnology**	Numerous industries, including electronics, materials science, and medicine, have created applications of nanotechnology and nanomaterials, which have improved product performance and sparked creativity.

Innovations in the secondary industrial sector continue to evolve in tandem with technological advancements and changes in consumer demands. In order to keep manufacturing competitive, reduce costs, improve product quality, and address sustainability concerns, it is imperative that these advancements be accepted.

2. ABOUT DISRUPTIVE INNOVATIONS USING TECH-BUSINESS ANALYTICS IN SECONDARY INDUSTRY SECTOR :

This might significantly alter the secondary industry sector, open up new business options, and boost competition [4-5]. Tech-business analytics may cause disruptions in the secondary industrial sector, including the following (Table 2):

Table 2: About disruptive innovations using TBA in the secondary industry sector

S. No.	Aspects	Description
1.	**Maintenance Prediction**	Tech-business analytics, powered by IoT sensors and machine learning, enables predictive maintenance in manufacturing. By using real-time data from equipment and machinery to forecast when maintenance is needed, manufacturers can save downtime and prevent costly malfunctions.
2.	**Quality Control**	Analytics systems that analyze production data can be used to identify faults or anomalies in real time. By assisting producers in identifying

		quality issues early in the production process, this reduces waste and improves the quality of the final products.
3.	**Supply Chain Optimization**	Advanced analytics can enhance supply chain operations through inventory level optimization, bottleneck identification, and demand forecasting. This leads to reduced expenses, quicker delivery times, and increased customer satisfaction.
4.	**Energy Efficiency**	Through the use of tech-business analytics, manufacturing processes' energy usage can be monitored and opportunities for energy reduction identified. A company's carbon footprint and operating costs are reduced as a result.
5.	**Production Optimization**	Analytics, which enables real-time parameter modifications based on data insights, can be used to optimize production processes. This leads to a more effective and efficient utilization of resources.
6.	**Customization and Personalization**	Tech-business analytics may make mass customization possible through the analysis of customer data and preferences. This has made it possible for manufacturers to offer their customers personalized products and services on a wide scale.
7.	**Smart Factories**	Analytics-driven solutions have the potential to transform conventional factories into smart ones.
8.	**Resource Allocation**	Companies can optimize resource allocation by analyzing labor, material, and equipment utilization statistics with analytics tools. Making sure resources are allocated efficiently helps lower costs.
9.	**Market Insights**	Business analytics can be a great source of information about market trends, consumer behavior, and competition intelligence.
10.	**Continuous Improvement**	Tech-business analytics may support a continuous improvement culture by providing data-driven insights and real-time feedback. Businesses can use this data to identify areas that require improvement in order to enhance procedures and products.
11.	**Risk Management**	Advanced analytics enables proactive risk detection in supply chain management, market dynamics, and production processes, which helps producers manage risks and take proactive measures.
12.	**Cost Reduction**	Using tech-business analytics to analyze cost data and identify inefficient zones can help manufacturers reduce production costs and boost profitability.
13.	**Sustainability**	Sustainability initiatives can benefit from analytics by reducing waste, ensuring adherence to environmental regulations, and monitoring and optimizing resource use.

Through the facilitation of data-driven decision-making, enhanced operational efficacy, and the creation of new prospects for customization and sustainability, disruptive technologies powered by tech-business analytics are revolutionizing the secondary industry sector. Utilizing these technologies effectively can provide businesses with a competitive advantage in a market that is changing quickly.

3. LITERATURE REVIEW :

A brief literature review of tech-business analytics in the secondary industries sector based on disruptive technologies is presented in Table 3.

Table 3: Review of tech-business analytics in the secondary industries sector based on disruptive technologies

S. No.	Area	Issue	Outcome	Reference
1.	Sector of the Quaternary Industry in Technology	Technology-driven business analytics may assist companies in this sector in making data-driven choices,	Businesses can utilize analytics tools to find inefficiencies in their operations and processes and	Kumar, S., et al. (2024). [6]

	Business Analytics	streamlining processes, and increasing efficiency.	implement changes that lower expenses, increase productivity, and eventually raise revenue. This could potentially increase customer happiness and loyalty.	
2.	An in-depth analysis of business analytics strategies and results.	This study focuses on incorporating cutting-edge analytical techniques and tools into organizational procedures as it methodically examines how business analytics aids in gaining a competitive edge in emerging markets.	This study broadens our knowledge of how business analytics may be used to successfully negotiate the challenges of emerging markets and provides a path for businesses looking to use data to gain a competitive edge.	Komolafe, A. M., et al. (2024). [7]
3.	An HR strategy that is driven by eco-innovation and data.	Though their activities frequently have detrimental consequences on the environment, the creative industries have a big say in how society is constructed and how individuals behave as consumers. Businesses all throughout the world are looking for creative ways to lessen their ecological footprint as the demand for environmental sustainability increases.	The integration of eco-innovation and data analytics into HR practices is a progressive way to addressing environmental challenges in the creative industries. By implementing this strategy framework, companies can reduce their environmental impact while simultaneously seizing chances for uniqueness and innovation in a market where consumers' concerns about the environment are growing.	Ejibe, I., et al. (2024). [8]
4.	Analyzing various strategies for handling uncertainty in the healthcare, medical device, and biotechnology sectors.	Research and development (R&D) and the launch of new products are key components of the biotechnology, medical device, and healthcare sectors, which are strongly linked to innovation. However, R&D and other innovation-related activities can be expensive, and launching new products onto the market is not always easy.	Additionally, a conceptual framework was created to aid in risk management in the health technology sector, defining 28 different types of uncertainty factors in BMs.	Javanmardi, E., et al. (2024). [9]
5.	In situations where disruptive innovation originates from users rather than producers.	Despite the user innovation literature's prediction that these come from current customers, which runs counter to the disruptive innovation literature, 43% of the disruptive innovations in the sample were initially developed by users, according to this study's	Consumers or producers typically develop disruptive innovations with high functional (technological) novelty, and users are more likely to innovate in less appropriate contexts and to be the source of disruptive process improvements.	Preißner, S., et al. (2024). [10]

		analysis of the sources of disruptive innovation.		
6.	A quantitative analysis of the personal care and household sector in India using ABCD.	The goal of this study is to apply the ABCD analytical technique to investigate the Indian household and personal care industry.	Through their analysis, stakeholders may contribute to the expansion, competitiveness, and societal effect of the Indian home and personal care sector while also ensuring sustainable development and ethical business practices.	Aithal, P. S. (2024). [11]
7.	Financial Technology's Effect on Financial Inclusion in Kenya.	Both data collection and analysis were conducted using a descriptive study design. The 25 million adult Kenyans who use fintech in varying degrees made up the study's population.	The impact of mobile phone adoption, agency banking, mobile money, and point of sale on financial inclusion was statistically significant.	Kamau, L., et al. (2024). [12]
8.	Using technological innovation and IT solutions, Sofia Tech is educating Tunisia. .	In order to better understand how engineering and digital IT solutions interact with the environment in Tunisia, this case study examines Sofia Tech, a company that offers engineering and IT solutions. This case study's thorough examination of Sofia Tech's service portfolios demonstrates the company's broad range of products and services, which include both traditional engineering specialties and state-of-the-art digital IT solutions.	Because no success story is complete without adversity, the case study examines Sofia Tech's challenges and issues as well as the company's flexible tactics. The report concludes with an outlook on how Sofia Tech intends to proceed, analyzing how the business is positioned to deal with the changing Tunisian engineering and digital IT industries. The company's role as a major actor is further cemented when it examines its contributions to innovation within the industry.	Ahmed, J. U. (2024). [13]
9.	Agricultural and Environmental Information Systems for Society 5.0 (ICCT).	Additionally, it will describe how these technologies have evolved throughout time and how they might be applied to encourage creative problem-solving. Through an analysis of the fundamental technologies that comprise ICCT in different domains, it seeks to illuminate the potential and difficulties associated with this convergence.	It includes case studies of successful ICCT implementations to assess new trends and potential applications in addition to summarizing the most important findings. This will help us better understand how ICCT is developing and how it will impact paradigms for sustainable agriculture and environmental information in the context of future society.	Aithal, S., et al. (2024). [14]
10	Tech Unleashed: How AI Affects Venture Capital and Startups.	In the first part of the chapter, the startup and venture capital environments are covered, along with the increasing importance of artificial intelligence.	It lays the foundation for future discussions by emphasizing the advantages of artificial intelligence, startups, and venture capital.	Kaur, J. (2024). [15]

4. OBJECTIVES OF THE RESEARCH PAPER :

(1) To examine TBA's new and disruptive concepts in the secondary industrial sector, tech-business analytics are being used.
(2) To study TBA's innovative technologies in the secondary industry sector and apply a variety of research methodologies.
(3) To investigate various approaches to dealing with TBA's disruptive technologies in the category of secondary industries.
(4) It should possess a thorough understanding of tech-business analytics and disruptive concepts in the secondary industrial sector.
(5) To use tech-business analytics tools to evaluate several SWOC analyses of every potential disruptive innovation in the secondary industry sector.
(6) To make more recommendations for enhancing the product and its thorough examination of TBA's ground-breaking innovations in the secondary industry sector.

5. METHODOLOGY :

Using tech-business analytics as a lens, disruptive discoveries in the secondary industrial sector require a methodical strategy that combines technological expertise and commercial acumen. A systematic approach to this is as follows:

Table 4: Techniques for the secondary industry sector based on disruptive technologies and tech-business analytics

S. No.	Aspects	Description
1.	**Identify Industry Pain Points**	First, conduct thorough market research to identify issues and inefficiencies in the secondary industrial sector. Operational bottlenecks, unfulfilled customer needs, high expenses, and issues with quality control are a few examples.
2.	**Technology Scanning**	Keep up with the newest advancements in secondary industrial-related sectors such as blockchain, IoT, AI, sophisticated analytics, and robots. Think about the ways in which these technologies could assist with the issues that have been addressed.
3.	**Gathering and Analyzing Data**	Collect pertinent data from many sources, such as supply chain, consumer feedback, internal operations, and market trends.
4.	**Prototype Development**	Build prototypes or minimal viable products (MVPs) using the technical solutions that have been discovered. These prototypes should take advantage of industry-identified pain points and utilize the latest technologies.
5.	**Pilot Testing**	Conduct prototype pilot tests in real-world settings in the secondary industries sector. Users, stakeholders, and industry experts should be consulted to determine whether the solutions are effective and to identify areas that require improvement.
6.	**Iterative Refinement**	Iterate and refine the prototypes in response to input gathered throughout the pilot testing phase to enhance their usability, functionality, and scalability. This can mean creating a better user interface, integrating with existing systems, or refining algorithms even further.
7.	**Business Model Innovation**	Analyze innovative business plans utilizing the new disruptive technologies. Depending on the value offered to customers, this may entail outcome-based pricing, pay-per-use, or subscription pricing models.
8.	**Market Adoption Strategy**	Make a comprehensive plan for launching and making money off of the disruptive inventions. This could mean working with significant market participants, obtaining the necessary government approvals, and starting targeted marketing and sales initiatives.

9.	**Scaling Up**	Focus on expanding your company to reach more customers and capture a larger share of the secondary industry sector once the disruptive technologies have gained market recognition. This can mean expanding the workforce, constructing more facilities, boosting production, and optimizing supply chain operations.
10.	**Continuous Monitoring and Improvement**	Get feedback from stakeholders and customers as you monitor the disruptive technology' long-term market success. Make use of these feedback to guide next revisions and improvements to ensure the products remain competitive and satisfy evolving market demands.

This methodology enables companies to leverage tech-business analytics to promote creative advancements in the secondary industry sector, leading to increases in competitiveness, productivity, and value creation.

6. ABOUT TECH-BUSINESS ANALYTICS IN SECONDARY INDUSTRY SECTOR :

In the secondary industrial sector, also referred to as the manufacturing sector, tech-business analytics is essential because it uses technology and data-driven insights to improve product quality, lower costs, streamline operations, and stimulate innovation.

Table 5: About TBA in secondary industry sector

S. No.	Aspects	Description
1.	**Gathering and Combining Data**	This data must be collected and combined from several sources in order to create a comprehensive picture of activities.
2.	**Predictive Maintenance**	One of the key applications of tech-business analytics in manufacturing is predictive maintenance.
3.	**Quality Control**	Technology-business analytics help manufacturers maintain consistent product quality. Real-time analysis of data can identify flaws or deviations from quality standards, allowing for prompt fixes.
4.	**Process Optimization**	Analytics tools analyze data to find bottlenecks, inefficiencies, and areas for improvement, which helps optimize industrial processes.
5.	**Inventory Management**	Manufacturers can analyze supply chain data and demand trends to optimize inventory levels. This minimizes additional inventory costs while ensuring that supplies are available when needed.
6.	**Supply Chain Optimization**	Manufacturing companies may reduce lead times, improve supplier relationships, and streamline logistics by using tech-business analytics, which can see the entire supply chain.
7.	**Energy Efficiency**	Analytics can monitor energy use in manufacturing processes and identify ways to reduce it. Lower operating costs and sustainability goals are aligned with this.
8.	**Customization and Personalization**	Businesses can deliver specialized and tailored product offers by employing analytics to comprehend market trends and client preferences.
9.	**Demand Forecasting**	Data-driven demand forecasting helps manufacturers match production plans to customer demand, reducing overproduction and underproduction.
10.	**Resource Allocation**	Costs can be reduced and productivity raised by using analytics to allocate people, resources, and equipment effectively.
11.	**Risk Management**	By doing proactive data analysis on a variety of factors, including supplier performance, market conditions, and operational dangers, manufacturers may foresee and lower risks.
12.	**Continuous Improvement**	Tech-business analytics supports a continuous improvement culture by offering data-driven insights and real-time feedback. Producers are able to make incremental improvements and are encouraged to innovate.

13.	**Market Insights**	Analytical tools provide useful data on industry trends, competition intelligence, and customer behavior.
14.	**Sustainability**	Analytics supports sustainability initiatives by monitoring and optimizing resource use, reducing waste, and ensuring environmental regulations are adhered to.
15.	**Cost Reduction**	TBA can assist businesses in identifying inefficiencies and analyzing cost information to lower manufacturing costs and increase profitability.

The secondary industrial sector is being revolutionized by tech-business analytics, which uses technology and data analytics to enhance operational performance, product quality, and sustainability. Manufacturers may maintain their competitiveness by using these analytics-driven tactics in a rapidly evolving industry.

7. POSSIBLE DISRUPTIVE INNOVATIONS USING TECH-BUSINESS ANALYTICS IN SECONDARY INDUSTRY SECTOR WITH EXPLANATIONS :

TBA has the potential to fundamentally alter traditional production processes and organizational structures in the secondary industrial sector.

Table 6: Possible disruptive innovations using TBA in secondary industry sector

S. No.	Aspects	Description
1.	**Predictive Analytics for Supply Chain Optimization**	Predictive analytics can be used to anticipate supply chain disruptions, inventory shortages, and fluctuations in demand. This enables manufacturers to optimize their supply networks in real-time, reducing lead times and ensuring on-time product delivery. It causes disruptions because it is more agile and responsive than traditional supply chain management.
2.	**Digital Twins for Product Development**	This innovation disrupts conventional approaches to product development by accelerating prototyping and doing away with the requirement for physical prototypes.
3.	**Blockchain for Supply Chain Security and Transparency**	This innovation disrupts traditional supply chain management through increased security, traceability, and transparency, which is especially helpful in high-value or complex supply chain industries.
4.	**Robotic Process Automation (RPA) in Manufacturing**	This innovation disrupts traditional production because it increases productivity, lowers error rates, and frees up human labor for more complex tasks.
5.	**Machine Learning for Demand Forecasting**	Because traditional forecasting methods are often less accurate and depend on human processes, this leads to issues with overstocking or understocking.
6.	**Using 3D Printing to Create Large Customizations**	Because it does not require expensive tooling or molds, this invention disturbs conventional mass production processes and enables customized, on-demand manufacturing.
7.	**Real-time Quality Control with Computer Vision**	Computer vision systems combined with machine learning algorithms enable real-time inspection of product defects on the production line. This disruption of traditional quality control procedures, which often involve human inspections and post-production testing, leads to faster fault identification and lower scrap rates.
8.	**Advanced Analytics for Energy Efficiency**	Advanced analytical tools are able to monitor energy use throughout the manufacturing process and identify opportunities for improvement. This disrupts traditional energy management by reducing carbon emissions, lowering energy costs, and promoting environmental goals.

9.	**Augmented Reality (AR) for Maintenance and Training**	Because AR technology overlays digital data on the physical world, it can be used for maintenance tasks and training workers in production. This invention challenges standard maintenance and training methods by providing real-time instruction and reducing the need for extensive training sessions.
10.	**IoT-Enabled Smart Factories**	Real-time data on manufacturing procedures, environmental factors, and equipment performance is collected by IoT-enabled smart factories. This invention disrupts conventional production since it offers proactive maintenance, process optimization, and better overall efficiency.

These concepts show how TBA could transform the secondary industrial sector by boosting output, reducing expenses, improving product quality, and encouraging innovation, providing manufacturers a competitive advantage in a rapidly evolving market.

8. SWOC ANALYSIS OF EACH POSSIBLE DISRUPTIVE INNOVATIONS USING TECH-BUSINESS ANALYTICS IN SECONDARY INDUSTRY SECTOR :

8.1 Strengths of Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector:

Businesses can benefit greatly from the many benefits that disruptive developments in the secondary industrial sector that employ tech-business analytics offer [16-20]. The following are some of these advancements' main advantages:

It seeks to determine their strengths and weaknesses, advantages and drawbacks, and the various outside factors that could affect their success. This study also offers a roadmap for how organizations, governments, and schools might employ incubationship to help develop a new generation of self-reliant, imaginative, and enterprising individuals. By emphasizing the critical role that incubatorship plays in preparing students for a society that requires flexibility, creativity, and innovation, it ultimately contributes to the ongoing conversation on how higher education has changed [16]. The creation of innovative, high-tech SMEs is essential to any nation's economic expansion. It inspires people to come up with fresh ideas and builds new infrastructure and workspaces. Simultaneously, SMEs continue to encounter numerous issues with their company performance. The study's goals are to identify the primary obstacles to the growth of high-tech SMEs in the fourth industrial revolution (4IR) age and to propose suggestions for policymakers to maximize the potential of SMEs. In order to achieve this, the authors examined research on the innovative development of SMEs and found that ineffective government assistance in this area is one of the primary obstacles to SMEs' growth [17]. A firm's operations, tactics, inventions, and market influence are all thoroughly examined in a company analysis research case study. Such analysis is essential to information technology research and education in order to comprehend how industry leaders, such as Infosys, create and implement technological breakthroughs in order to preserve their competitive edge. It provides insightful information about how IT solutions are used in the real world, how strategic decisions are made, and how services are evolving. This method assists scholars and students in recognizing trends, obstacles, and best practices that can guide future developments in the IT sector. This study examines the Infosys IT company's innovation strategy, technology adoption, and IT service evolution in order to assess the company's level of innovation [18]. Technology breakthroughs have spurred the business sector to capitalize on the rising tide of consumer demand for senior care services as demographic shifts result in ageing societies. This study examines the People's Republic of China's emerging smart senior care service model in order to determine the most important decision-making techniques. Using a thorough literature research, a SWOT analysis is conducted to highlight the advantages, disadvantages, possibilities, and dangers of China's smart senior care system [19]. The idea of the circular economy is crucial in many different industries, including the primary, secondary, tertiary, and quaternary sectors. All industry sectors are greatly impacted by this idea since it encourages resource efficiency, waste reduction, innovation, and sustainable practices. Industries can create economic value and reduce their environmental effect while also helping to move towards a more resilient and sustainable economy by adopting circular ideas [20].

Table 7: Strengths of disruptive developments in the secondary industry sector that use tech-business analytics

S. No.	Aspects	Description
1.	**Increased Productivity**	TBA improve manufacturing processes in real-time increases operations efficiency. It is possible to find and fix bottlenecks, reduce downtime, and streamline manufacturing processes.
2.	**Cost Reduction**	Disruptive advancements in tech-business analytics can identify waste, overuse, and inefficiencies in resources, resulting in cost reductions in labor, production, and energy use. A rise in overall profitability may result from this.
3.	**Improved Product Quality**	Real-time data analysis and quality control systems help manufacturers identify defects and deviations from quality standards early in the production process, improving product quality and reducing scrap.
4.	**Customization at Scale**	Through the use of consumer data and preferences, tech-business analytics enable mass customization, allowing manufacturers to develop goods that are exactly tailored to the demands of each individual client without having to spend large additional costs.
5.	**Enhanced SCM**	SCM is more secure, traceable, and visible thanks to blockchain technology and predictive analytics. This reduces supply chain disruptions, enhances logistics, and lowers the cost of carrying inventory.
6.	**Data-Informed Choice Making**	TBA provides valuable insights. Thus, facts and knowledge can be used to make judgments regarding various aspects of manufacturing and business operations.
7.	**Faster Time-to-Market**	Rapid prototyping and product development are made possible by digital twin technology and simulation tools.
8.	**Sustainability Compliance**	Analytics systems that measure and optimize energy and resource use may help industries satisfy sustainability goals and environmental standards.
9.	**Risk Mitigation**	Advanced analytics can assist in identifying and mitigating supply chain, market, and operational risks through the use of scenario modeling tools and early warning indicators.
10.	**Competitive Advantage**	Manufacturers can maintain an advantage over their competitors in terms of efficiency, product quality, and customer response by implementing innovative developments in tech-business analytics.
11.	**Enhanced Customer Experience**	Improved customer experiences, made possible by personalization and customization enabled by analytics-driven insights, can increase customer satisfaction and loyalty.
12.	**Adaptability**	Over time, tech-business analytics systems can adapt to changing organizational requirements and market situations to remain relevant and effective.
13.	**Facilitation of Innovation**	TBA encourages innovation and experimentation within businesses.
14.	**Agility**	By employing real-time monitoring and analytics, manufacturers may respond quickly to unanticipated events, shifts in the market, or modified customer preferences.
15.	**Globalization Support**	Regardless of your location, tech-business analytics allows you to see and manage supply chains and production processes, which facilitates doing business abroad.
16.	**Scalability**	These tech-business analytics solutions can be developed with a manufacturing company and benefit both small and large organizations.

The secondary industrial sector benefits greatly from disruptive developments that make use of tech-business analytics. Enhanced productivity, lower costs, improved quality, flexibility, and the ability to

stay competitive in a market that is ever evolving are some of these benefits. These advancements are altering the manufacturing landscape by enabling companies to thrive in the digital age.

8.2 Weaknesses of Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector:

The secondary industry sector has challenges and disadvantages despite the numerous advantages of disruptive innovations that use tech-business analytics. Different vulnerabilities may exist in different implementations and settings; however, the following are some common problems [21-22]:

Table 8: Weaknesses of Tech-business analytics-based disruptive technologies in the secondary industry sector

S. No.	Aspects	Description
1.	**Cost of Implementation**	When deploying tech-business analytics solutions, significant upfront investments may be required for hardware, software, technology, and employee training. For smaller businesses, these expenses may be prohibitive.
2.	**Data Privacy and Security**	Our increasing reliance on data and communication poses risks to privacy and data security. Protecting critical production data is essential due to cyberattacks and security breaches.
3.	**Integration Complexity**	It can be challenging and time-consuming to integrate tech-business analytics solutions with current manufacturing processes and systems. Operational outages could result from compatibility problems.
4.	**Skilled Workforce**	The successful deployment of tech-business analytics requires a skilled workforce that can use and interpret analytics tools. A significant challenge could be the scarcity of qualified data analytics specialists.
5.	**Resistance to Change**	Staff members and management may oppose changes brought about by disruptive innovations, especially if they believe that their job security or established practices are in danger.
6.	**Data Quality**	One important consideration for analytics systems is data entry accuracy. Inaccurate or absent information may lead to poor decisions and conclusions.
7.	**Initial Learning Curve**	When new technology and analytics tools are implemented, employee learning curves and training may be required, which could affect output during the transition.
8.	**Overreliance on Technology**	It's dangerous to rely too much on technology since it could divert focus from human judgment and expertise. The use of human judgment should remain essential in decision-making.
9.	**Ethical Concerns**	The mass collection and use of data raises a number of ethical concerns, including data privacy, monitoring, and potential exploitation of personal information.
10.	**Limited Scalability**	Some tech-business analytics solutions may have scalability issues when dealing with big data sets or rapid corporate expansion.
11.	**Interoperability Challenges**	It may be challenging to integrate analytics solutions from several sources, create data silos, and these technologies may not work as planned.
12.	**Maintenance and Updates**	Analytics systems require frequent maintenance and updates to be secure and efficient. Ignoring these requirements may result in software flaws.
13.	**Complexity of Analytics Outputs**	Non-technical decision makers may find it challenging to comprehend and act upon the insights generated by analytics technology if it is overly complex.

14.	**Lack of Industry Standards**	It could be more challenging to compare and implement analytics solutions if there are no industry-specific standards or standardized analytics techniques.
15.	**Regulatory Compliance**	Because of the speed at which technology is evolving, manufacturers need to ensure that their tech-business analytics processes follow industry-specific guidelines. It can be challenging to achieve this.
16.	**Dependency on External Factors**	Because they may be impacted by external factors like the market, technological advancements, or regulatory changes, the success of disruptive ideas is unpredictable.

To address these issues, organizations must carefully plan and execute their tech-business analytics initiatives. Data security, staff training, and change management are some of the factors they need to consider. Achieving balance between the potential benefits and challenges posed by these disruptive innovations in the secondary industrial sector is crucial.

8.3 Opportunities of Disruptive Innovations using Tech-Business Analytics in Secondary Industry Sector:

The secondary industrial sector's manufacturers have numerous chances to enhance their operations, obtain a competitive edge, and foster expansion through disruptive technologies and tech-business analytics. The following significant opportunities are presented by these developments [23-25]:

Table 9: Tech-business analytics-based disruptive innovation opportunities in the secondary industries sector

S. No.	Aspects	Description
1.	**Improved Efficiency**	Through the ability to monitor and optimize industrial activities in real time, tech-business analytics improves operational effectiveness. This could lead to lower production costs and higher productivity.
2.	**Cost Reduction**	Analytics-driven insights can help manufacturers identify waste, resource usage, and energy inefficiencies, which can reduce operating costs and boost profitability.
3.	**Enhanced Product Quality**	Real-time data analysis and quality control systems help manufacturers identify defects and deviations from quality standards early in the production process, improving product quality and reducing scrap.
4.	**Supply Chain Optimization**	By employing blockchain technology and predictive analytics, manufacturers may improve supply chain visibility, traceability, and security while also fortifying supplier relationships, expediting logistics, and reducing lead times.
5.	**Data-Driven Decision-Making**	Actionable insights from data analysis are provided by tech-business analytics, which facilitate decision-making across various manufacturing and business processes.
6.	**Customization at Scale**	Tech-business analytics, which provide actionable insights from data analysis, facilitate decision-making across a variety of manufacturing and corporate operations.
7.	**Faster Time-to-Market**	Rapid prototyping and product development are made possible by digital twin technology and simulation tools.
8.	**Sustainability Compliance**	Through monitoring and resource and energy optimization, analytics solutions can assist enterprises in meeting sustainability goals and environmental norms.
9.	**Risk Mitigation**	Advanced analytics may assist in identifying and mitigating supply chain, market, and operational risks through the use of early warning indicators and scenario modeling tools.

10.	**Competitive Advantage**	Manufacturers can maintain an advantage over their competitors in terms of efficiency, product quality, and customer response by implementing innovative developments in tech-business analytics.
11.	**Enhanced Customer Experience**	The customer experience can be enhanced and loyalty increased through personalization and customization made possible by analytics-driven insights.
12.	**Adaptability**	Real-time monitoring and analytics also enable manufacturers to respond quickly to unanticipated events, market shifts, or changes in customer preferences.
13.	**Globalization Support**	Tech-business analytics simplify global operations by enabling remote insight and control over supply chains and production processes.
14.	**Scalability**	You can see and manage supply chains and production processes from anywhere with tech-business analytics, which facilitates doing business globally.
15.	**Facilitation of Innovation**	Tech-business analytics encourage experimentation and innovation in enterprises.
16.	**Agility**	Using real-time analytics, businesses can swiftly adjust their production and supply chain.
17.	**Operational Resilience**	For manufacturers, tech-business analytics can help build operational resilience by identifying vulnerabilities and taking proactive measures to reduce disruptions.

There are numerous benefits of using tech-business analytics to propel disruptive innovations, such as improved quality, lower costs, more flexibility, more productivity, and the ability to stay competitive in a rapidly evolving market.

8.4 Challenges of Disruptive Innovations using Tech-Business Analytics in the Secondary Industry Sector:

The secondary industry sector—that is, manufacturing and industrial production—is undergoing a transformation due to disruptive technologies driven by tech-business analytics. These developments present serious difficulties even if they have the potential to greatly improve productivity, product personalization, and decision-making. Below is a summary of the difficulties [26-30]:

Table 10: Tech-business analytics-based disruptive innovation constraints in the secondary industries sector

S. No.	Aspects	Challenges	Impacts
1.	**Integration with Legacy Systems**	It can be expensive, complicated, and dangerous to integrate contemporary analytics platforms and technologies (AI, IoT, and ML) with outdated infrastructure.	Possible data discrepancies, longer downtime, and adoption delays.
2.	**Data Silos and Quality Issues**	Data must be clean, organized, and consistent for analytics to work. Siloed information or inconsistent data quality prevents valuable insights.	Decreased precision in inventory control, production optimization, and forecasting.
3.	**High Initial Costs and ROI Uncertainty**	A lack of clarity on return on investment (ROI) discourages stakeholders from utilizing the technology to its maximum potential.	Adoption hesitancy, particularly in small and medium-sized businesses (SMEs).

4.	**Skills Gap and Workforce Resistance**	Hybrid expertise that is knowledgeable about both data analytics and industrial processes is becoming more and more in demand.	Fears of losing one's career, retraining costs, and resistance to change.
5.	**Cybersecurity Risks**	The complexity of protecting sensitive commercial and operational data increases.	Attacks or compromises of data could impair trust and cause production disruptions.
6.	**Change Management and Cultural Barriers**	The resistance to change may come from hierarchical decision-making frameworks and organizational inertia.	Decreased agility, slower uptake, and unused analytics power.
7.	**Regulatory and Compliance Issues**	It might be difficult to navigate local and international laws when utilizing new technology.	Heightened possibility of production halts or fines for noncompliance.
8.	**Over-Reliance on Technology**	Poor decisions may result from inaccurate models or misinterpreted facts.	Inadequate operations, poor quality, or lost chances.
9.	**Scalability and Flexibility Issues**	It's hard to customize for various production lines or regions.	Operations have become more complex, and performance has been inconsistent.
10.	**Environmental and Ethical Concerns**	Juggling social obligations and efficiency.	Poor public opinion or a bad impression of the brand.

There are amazing prospects in the secondary sector thanks to disruptive developments that use tech-business analytics, such as predictive maintenance and smart manufacturing. However, these developments also present issues with the workforce, data, integration, ethics, security, and cost. To overcome them, a deliberate combination of process reform, people, and technology is needed.

9. SUGGESTIONS :

Disruptive technologies powered by techno-business analytics have the ability to completely transform manufacturing procedures and open up new commercial prospects in the secondary industry sector. In order to properly apply these innovations, take into account the following recommendations [31-35]:

Table 11: TBA-based recommendations for disruptive technologies in the secondary industries sector

S. No.	Aspects	Suggestions
1.	**Evaluate the company's goals**	Begin by clearly outlining your objectives and anticipated outcomes for your company. Understand the unique challenges and opportunities your production and supply chain operations bring.
2.	**Data Strategy**	Explain data collection, management, and storage practices in a comprehensive data plan. Check the data's correctness, security, and compliance with relevant laws.
3.	**Invest in Talent**	Put together and train a team of analysts, data scientists, and domain experts who can work together to extract insights from data and advance data-driven decision-making.
4.	**Choose the Right Analytics Tools**	Verify that the analytics and technology you select help your business achieve its goals. Examine cloud-based possibilities for flexibility and scalability.
5.	**Data Integration**	Ascertain the smooth integration of analytics tools with existing data sources and manufacturing processes. If data silos exist, analytics may perform worse.
6.	**Real-time Monitoring**	Real-time monitoring systems that employ IoT sensors and data analytics can produce valuable.

7.	**Predictive Maintenance**	Use predictive maintenance solutions to lower maintenance costs and equipment downtime. Use machine learning techniques to forecast when maintenance will be required.
8.	**Quality Control**	Make use of computer vision and machine learning to deliver quality control in real time. Allow for consistent product quality and automate defect detection.
9.	**Supply Chain Visibility**	Analytics can be used to increase supply chain visibility. Supply chain tracking may be done safely and transparently with blockchain.
10.	**Energy Efficiency**	Use analytics-driven energy management tools to track and improve energy consumption in manufacturing processes.
11.	**Customization and Personalization**	Take advantage of client data and predictive analytics to create extensive personalized product and service offers. Adjust your manufacturing processes to meet each client's unique needs.
12.	**Experiment with Digital Twins**	Examine how digital twin technologies can be used to simulate and enhance production processes, product designs, and equipment performance before putting them into practice.
13.	**Employee Training**	Invest in training programs to ensure employees are skilled in using analytics software and interpreting data results.
14.	**Change Management**	Through clear communication, involving employees in the adoption process, and emphasizing the benefits of analytics-driven decision-making, you might potentially overcome cultural resistance to change.
15.	**Continuous Improvement**	You may foster a continuous improvement culture by routinely evaluating and refining your analytics processes and methods.
16.	**Security and Compliance**	Prioritize data protection and adhering to industry-specific laws. Implement robust cybersecurity protocols to protect important manufacturing data.
17.	**Collaborate and Benchmark**	Work together with associations, industry peers, and tech businesses.
18.	**Start Small, Scale Gradually**	When deploying analytics tools throughout the entire organization, begin with pilot projects to gauge their effectiveness. Note the errors that were made during the initial implementation efforts and fix them.
19.	**Stay Agile**	As market conditions and technology evolve, be prepared to adapt. It need agility to fully employ disruptive ideas.
20.	**Measure and evaluate**	Determine how tech-business analytics affect your financial results and production operations by setting up key performance indicators (KPIs). These metrics can be used to direct future plan evaluation and improvement.

One can use tech-business analytics to drive disruptive innovations and keep your competitive edge in the secondary industry sector by implementing these suggestions and tailoring them to your particular manufacturing environment [36-37].

10. CONCLUSIONS :

In the secondary industry sector, TBA-based disruptive technologies are a game-changer that can improve output, lower costs, optimize manufacturing processes, boost innovation, and improve product quality. Modern technologies such as digital twins, machine learning, the Internet of Things, and data analytics are used in these advances to offer automation, real-time insights, and predictive capabilities. In a rapidly evolving market, manufacturers who adopt these advances can obtain a competitive advantage. But for implementation to be successful, meticulous planning, a dedication to a data-driven culture, and investments in knowledge and technology are needed. For these disruptive advancements to completely realize their potential, obstacles including data privacy, integration complexity, and change resistance must be overcome. With its potential for operational excellence, agility, customer-centricity, and sustainability, tech-business analytics is finally revolutionizing the secondary industry sector. Businesses who successfully implement these innovations will be well-positioned to prosper in

the digital era and satisfy the demands of a manufacturing environment that is more dynamic and data-driven.

REFERENCES :

[1] Sibanda, W., Ndiweni, E., Boulkeroua, M., Echchabi, A., & Ndlovu, T. (2020). Digital technology disruption on bank business models. *International Journal of Business Performance Management*, *21*(1-2), 184-213. Google Scholar↗

[2] Hossain, A., Rasul, I., Akter, S., Eshra, S. A., & Turja, T. S. (2024). Exploring AI's Role in Business Analytics for Operational Efficiency: A Survey Across Manufacturing Sectors. *Journal of Business Insight and Innovation*, *3*(2), 1-17. Google Scholar↗

[3] Komolafe, A. M., Aderotoye, I. A., Abiona, O. O., Adewusi, A. O., Obijuru, A., Modupe, O. T., & Oyeniran, O. C. (2024). Harnessing business analytics for gaining competitive advantage in emerging markets: A systematic review of approaches and outcomes. *International journal of management & entrepreneurship research*, *6*(3), 838-862. Google Scholar↗

[4] Vlachopoulou, M., Ziakis, C., Vergidis, K., & Madas, M. (2021). Analyzing agrifood-tech e-business models. *Sustainability*, *13*(10), 5516. Google Scholar↗

[5] Hongdao, Q., Bibi, S., Khan, A., Ardito, L., & Khaskheli, M. B. (2019). Legal technologies in action: The future of the legal market in light of disruptive innovations. *Sustainability*, *11*(4), 1015. Google Scholar↗

[6] Kumar, S., & Aithal, P. S. (2024). Tech Business Analytics in Quaternary Industry Sector. *International Journal of Case Studies in Business, IT and Education (IJCSBE)*, *8*(2), 69-159. Google Scholar↗

[7] Komolafe, A. M., Aderotoye, I. A., Abiona, O. O., Adewusi, A. O., Obijuru, A., Modupe, O. T., & Oyeniran, O. C. (2024). Harnessing business analytics for gaining competitive advantage in emerging markets: a systematic review of approaches and outcomes. *International Journal of Management & Entrepreneurship Research*, *6*(3), 838-862. Google Scholar↗

[8] Ejibe, I., Nwankwo, T. C., Nwankwo, E. E., Okoye, C. C., & Scholastica, U. C. (2024). Advancing environmental sustainability in the creative sectors: A strategic HR framework based on data analytics and eco-innovation. World Journal of Advanced Research and Reviews, 21(3), 050-060. Google Scholar↗

[9] Javanmardi, E., Maresova, P., Xie, N., & Mierzwiak, R. (2024). Exploring business models for managing uncertainty in healthcare, medical devices, and biotechnology industries. *Heliyon*. *1*(1), 2-17. Google Scholar↗

[10] Preißner, S., Raasch, C., & Schweisfurth, T. (2024). When necessity is the mother of disruption: Users versus producers as sources of disruptive innovation. *Journal of Product Innovation Management*, *41*(1), 62-85. Google Scholar↗

[11] Aithal, P. S. (2024). Quantitative ABCD Analysis: Indian Household and Personal Care Sector. *International Journal of Case Studies in Business, IT and Education (IJCSBE)*, *8*(2), 160-184. Google Scholar↗

[12] Kamau, L., & Aduda, J. (2024). The Effect of Financial Technologies on Financial Inclusion in Kenya. *Journal of Economics, Finance and Business Analytics*, *2*(1), 45-57. Google Scholar↗

[13] Ahmed, J. U. (2024). Sofia Tech: Driving innovation through engineering excellence and IT solutions in Tunisia. *Journal of Information Technology Teaching Cases*, 20(4), 388-692. Google Scholar↗

[14] Aithal, S., & Aithal, P. S. (2024). Information Communication and Computation Technologies (ICCT) for Agricultural and Environmental Information Systems for Society 5.0. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *8*(1), 67-100. Google Scholar↗

[15] Kaur, J. (2024). Tech Unleashed: The Influential Power of Artificial Intelligence on Venture Capital and Startups. In *Fostering Innovation in Venture Capital and Startup Ecosystems* (pp. 219-241). IGI Global. Google Scholar↗

[16] Aithal, P. S., & Aithal, S. (2023). Incubationship–A Systematic Analysis of Recently Announced Super Innovation in Higher Education using SWOC, ABCD, and PESTL Frameworks. *International Journal of Case Studies in Business, IT, and Education (IJCSBE), 7*(4), 48-90. Google Scholar↗

[17] Antoniuk, L., Gernego, I., Dyba, V., Polishchuk, Y., & Sybirianska, Y. (2017). Barriers and opportunities for hi-tech innovative small and medium enterprises development in the 4th industrial revolution era. *Problems and Perspectives in Management*, *15*(4), 100-113. Google Scholar↗

[18] Aithal, P. S., & Rao, A. S. (2024). Infosys: A Case Study of IT Service Evolution, Technology Adoption & Innovation Strategies. *Poornaprajna International Journal of Teaching & Research Case Studies (PIJTRCS), 1*(2), 77-129. Google Scholar↗

[19] Singh, V., & Das, P. (2024). Sustainable Business Innovation: The Case of Smart Elderly Care Service in China. *Frontiers in Health Informatics*, *13*(4). Google Scholar↗

[20] Aithal, S., & Aithal, P. S. (2023). Importance of circular economy for resource optimization in various industry sectors–A review-based opportunity analysis. *International Journal of Applied Engineering and Management Letters (IJAEML), 7*(2), 191-215. Google Scholar↗

[21] Kumar, S., & Aithal, P. S. (2023). Tech-Business Analytics in Primary Industry Sector. *International Journal of Case Studies in Business, IT, and Education (IJCSBE), 7*(2), 381-413. Google Scholar↗

[22] Kumar, S., & Aithal, P. S. (2023). Tech-Business Analytics–a New Proposal to Improve Features and Quality of Products and Services in Various Industry Sectors–An Explorative Study. International Journal of Management, Technology and Social Sciences (IJMTS), 8(2), 53-70. Google Scholar↗

[23] Kumar, Sachin. & Krishna Prasad, K. (2019). Modified Location Model Estimation using Content Based Medical Image Retrieval. *International Journal of Management, Technology, and Social Sciences (IJMTS), 4(2), 36-45.* Google Scholar↗

[24] Devanshu Dube, Dr. Sachin Kumar,, Santosh Kumar Gupta,"An Empirical study of the IoT arrhythmia detection methods: Review and research gaps",2021 International Conference on Computer Communication and Informatics (ICCCI) Year: 2021 | Conference Paper | Publisher: IEEE Google Scholar↗

[25] Sachin Kumar, Devanshu Dube, Krishna Prasad, K. & Aithal, P. S. (2020). Emerging Concept of Tech- Business-Analytics an Intersection of IoT & Data Analytics and its Applications on Predictive Business Decisions. *International Journal of Applied Engineering and Management Letters (IJAEML), 4*(2), 200-210. Google Scholar↗

[26] Kumar, S., Krishna Prasad, K., & Aithal, P. S., (2023). Tech-Business Analytics in Primary Industry Sector. *International Journal of Case Studies in Business, IT, and Education (IJCSBE), 7*(2), 381-413. Google Scholar↗

[27] Sachin Kumar, Hirdesh Sharma, Vijay Kumar Tiwari, Namita Sharma and Roshan Kumari (2023), detection and prevention of cancer in early stages using linear regression algorithm, *Journal of Data Acquisition and Processing, 38*(2), 4238-4255. Google Scholar↗

[28] Kumar, S., Krishna Prasad, K., & Aithal, P. S., (2022). Technology for Better Business in Society. *International Journal of Philosophy and Languages (IJPL), 1*(1), 117-144. Google Scholar↗

[29] Kumar, S., & Aithal, P. S. (2024). Tech Business Analytics in Quaternary Industry Sector. *International Journal of Case Studies in Business, IT and Education (IJCSBE)*, *8*(2), 69-159. Google Scholar↗

[30] Kumar, S., & Aithal, P. S. (2023). Tech-Business Analytics–a New Proposal to Improve Features and Quality of Products and Services in Various Industry Sectors–An Explorative Study. *International Journal of Management, Technology and Social Sciences (IJMTS)*, *8*(2), 53-70. Google Scholar↗

[31] Kumar, S., & Aithal, P. S. (2023). Tech-Business Analytics in Tertiary Industry Sector. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *7*(4), 349-454. Google Scholar↗

[32] Kumar, S., & Aithal, P. S. (2023). Tech-Business Analytics in Secondary Industry Sector. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *7*(4), 1-94. Google Scholar↗

[33] Aithal, P. S. (2023). Enhancing Industrial Automation through Efficient Technology Management in Society. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *7*(4), 184-215. Google Scholar↗

[34] Aithal, P. S., & Aithal, S. (2023). Tech-Business Analytics and Its Applications in Higher Education Innovations. *Chapter 2*, 17-42. Google Scholar↗

[35] Kumar, S., & Aithal, P. S. (2024). Tech-Business Analytics in Blue Economy. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *8*(2), 156-185. Google Scholar↗

[36] Kumar, S., & Aithal, P. S. (2022). Technology for Better Business in Society. *International Journal of Philosophy and Languages (IJPL)*, *1*(1), 117-144. Google Scholar↗

[37] Aithal, S., & Aithal, P. S. (2023). Importance of Circular Economy for Resource Optimization in Various Industry Sectors–A Review-based Opportunity Analysis. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *7*(2), 191-215. Google Scholar↗

****