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Comparative study on performance management of steel industry pre covid and post covid era

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ABSTRACT:

The steel industry plays a pivotal role in global economic development, serving as a backbone for various sectors such as construction, automotive, and manufacturing. However, the outbreak of the COVID-19 pandemic in late 2019 significantly disrupted global supply chains, trade patterns, and economic activities, thereby impacting the performance management strategies of steel companies worldwide. This comparative study aims to analyze and contrast the performance management practices adopted by steel industry players before and after the onset of the COVID-19 pandemic.

The pre-COVID-19 era witnessed a period of relative stability and growth in the global steel industry. Performance management in this phase primarily focused on enhancing operational efficiency, optimizing production processes, and ensuring cost-effectiveness. Key performance indicators (KPIs) such as production output, capacity utilization, and profitability were the primary metrics used to evaluate the performance of steel companies. Strategies such as lean manufacturing, Six Sigma, and Total Quality Management (TQM) were commonly employed to streamline operations and drive continuous improvement.

However, the emergence of the COVID-19 pandemic in early 2020 brought unprecedented challenges to the steel industry. Lockdowns, travel restrictions, and supply chain disruptions led to a sharp decline in demand for steel products, forcing companies to reassess their performance management strategies. In response to the crisis, steel companies shifted their focus towards resilience, agility, and risk management. Performance management frameworks were adapted to address new challenges such as remote work, supply chain disruptions, and fluctuating demand patterns. KPIs were revised to include metrics related to supply chain resilience, workforce safety, and financial stability.

This study employs a mixed-methods approach, combining quantitative analysis of financial data with qualitative insights from industry experts and executives. Data from pre-COVID-19 and post-COVID-19 periods will be compared and analyzed to identify trends, challenges, and best practices in performance management within the steel industry. The findings of this study will provide valuable insights for steel companies seeking to navigate the complexities of the post-pandemic business landscape and optimize their performance management strategies accordingly.

Keywords: Steel Industry, Performance Management, COVID-19, Comparative Study, Resilience, Supply Chain Management, Risk Management, Operational Efficiency.

Importance:

Theoretical Implications:

- Performance Management Paradigm Shift: By comparing pre-COVID and post-COVID performance management practices, this study will shed light on the paradigm shift in the steel industry's approach to performance evaluation and optimization. Understanding how companies adapted their performance management systems in response to the pandemic can provide theoretical insights into organizational resilience and agility.

- Impact of Disruption on Key Performance Indicators (KPIs): The research will analyze the changes in KPIs such as production output, operational efficiency, financial performance, and employee productivity, offering theoretical insights into the dynamics of performance measurement during periods of significant disruption. This analysis can inform theoretical frameworks for assessing performance in volatile environments.

- Adaptive Strategies and Best Practices: By identifying successful adaptive strategies employed by steel companies in response to COVID-19, this study will contribute to the theoretical understanding of crisis management and organizational learning. Theoretical implications will extend to broader contexts beyond the steel industry, offering insights into effective performance management strategies in times of uncertainty.

- Resilience and Sustainability: The research will explore how the pandemic influenced the resilience and sustainability agendas of steel companies, contributing to theoretical discussions on organizational resilience and sustainable performance. Understanding how companies balanced short-term survival with long-term sustainability goals can inform theoretical frameworks for integrating resilience into performance management practices.

Research Gap

Current research in the steel industry reveals several significant gaps that present opportunities for further study and technological advancements. These gaps are largely centered around decarbonization, process efficiency, and circular economy integration.

***Decarbonization Technologies**:**

The steel industry is under pressure to reduce its carbon footprint, yet there are considerable technological challenges. Research is needed to improve carbon capture and utilization (CCU) technologies, such as those converting waste gases from steelmaking into valuable chemicals or fuels. Projects like Steelanol and Carbon2Chem have made strides, but further advancements in catalyst development and process integration are necessary to enhance efficiency and reduce costs【5†source】【6†source】.

***. **Energy Efficiency**:**

Enhancing the energy efficiency of steel production processes remains a critical area. Innovative technologies, such as using hydrogen instead of coke in iron reduction (a process still in early development stages), could significantly lower emissions. Research is required to overcome technical and economic barriers to make these processes commercially viable【5†source】.

. ***Circular Economy Practices**:**
Incorporating circular economy principles into the steel industry involves challenges such as improving scrap metal recycling and reducing waste. More interdisciplinary research is needed to develop methods for increasing the recovery and reuse of materials throughout the steel lifecycle. This includes improving the quality of recycled steel and developing new applications for steel waste【6†source】.

***. **Advanced Materials and Manufacturing Techniques**:**

There is a need for research into new materials and manufacturing techniques that can reduce the environmental impact and improve the performance of steel products. This includes the development of high-strength, lightweight steels and the use of additive manufacturing to reduce material waste【5†source】.

***5. **Policy and Economic Studies**:**

Understanding the economic and policy implications of transitioning to low-carbon and circular economy practices is essential. This involves studying the economic viability of new technologies, the impact of regulatory frameworks, and the financial incentives required to support innovation and adoption .

Objectives

- **The objectives of the steel industry typically encompass several key areas:**

- **Production Efficiency**: Maximizing output while minimizing costs and waste through advanced technologies and optimized processes.

- **Sustainability**: Reducing environmental impact by adopting eco-friendly practices, improving energy efficiency, and increasing the use of recycled materials.

- **Innovation**: Investing in research and development to create new steel products and improve existing ones, enhancing their properties and applications.
- **Safety**: Ensuring the safety and well-being of workers through stringent health and safety standards and continuous training.
- **Quality**: Maintaining high standards of product quality to meet or exceed customer expectations and industry standards.
- **Market Competitiveness**: Enhancing competitiveness in the global market through strategic pricing, quality, and innovation.
- **Economic Contribution**: Contributing to the economy by creating jobs, supporting related industries, and fostering regional development.
- **Customer Satisfaction**: Providing excellent customer service and support to build and maintain strong relationships with clients.
- **Compliance**: Adhering to all relevant regulations and standards, both locally and internationally, to ensure lawful and ethical operations.
- **Community Engagement**: Engaging with local communities through corporate social responsibility initiatives and supporting local development projects.

Review of literature

1.The paper examines the progressions happening in the steel business and related markets as they move towards Industry 4.0. With critical interests in new innovations, steel plants are establishing a shrewd climate for participation between makers, merchants, and customers of steel items. The impact of Industry 4.0 inside plants is being moved to different members in the steel item chains, as well as the other way around. The exploration planned to decide the effect of Industry 4.0 advances on the steel item chains in the Clean steel market. The examination was led in Poland. The got information base contained 208 respondents (organization leaders), including steel factories and steel item producers. Innovations (the mainstays of Industry 4.0) are assembled into five mechanical fields: mechanization and mechanical technology; stockroom robotization; PC frameworks, frameworks mix, portable advances, Large Information and IIoT, Blockchain and network safety. Examination was acknowledged in the three respondent sections addressing the steel chain in Poland [RSs]: Maker [P], Merchant [D], and Purchaser [C]. The aftereffects of the examination can assist organizations with further developing their steel item chains. The review adopts a worth chain strategy, taking into account steel creation, dispersion of steel items, and administrations for orders and shoppers of endlessly steel items.

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4 RESEARCH METHODOLOGY

Research methodology is a way to systematically solve the research problem It may be understood as a science of studying how research is done scientifically. So the research methodology not only talks about the research methods but also consider the logic behind the method used in context of the research study.

Research design

Descriptive research used in this study because it will ensure the minimization of bias and maximization of reliability of data collected. The researcher had to use fact and information already available through financial statements of earlier years and analyse these to make critical evaluation of available material. Hence by making the type of research conducted to be both Descriptive and Analytical in nature.

Data collection

a) Primary data

Primary data is data originated for the first time by the researcher through direct efforts and experience, specifically for the purpose of addressing his research problem. Also known as the first hand or raw data. The data can be collected through various methods like surveys, observations, physical testing, mailed questionnaires personal interviews, telephone interviews, case studies etc.

b) Secondary data

Secondary data implies second hand information which is already collected and recorded by any person other than a user for a purpose, not relating to the current research problem. It is the readily available form of data collected from various sources like censuses, government publication, internal records of the organizations, reports books journal articles, websites and so on.

Sources of data

The required data for the study are basically secondary in nature and the data are collected from the audited reports of the company. The sources of data are from the annual reports of the company from the year 2015-2016 to 2019-2020.

Methods of data analysis

The data collected were classified and tabulated for analysis. The analytical tool used in this study.
The study employs the following analytical tools:

- Graph
- Ratio analysis
- Data analysis

a.1. CURRENT RATIO OF TATA STEEL -
March 2018-March 2019: 86666/97295 = 0.89:1
March 2019-March 2020: 92557/90588 = 1.02:1
March 2020-March 2021: 60212/70867 0.84:1
March 2021-March 2022: 58733/61661 0.95:1
March 2022-March 2023: 58991/61034 = 0.96:1

a.2. CURRENT RATIO OF JSW –
March 2018-March 2019: 33555/42008 = 0.79/1
March 2019-March 2020: 36478/43688 = 0.83/1
March 2020-March 2021: 35852/43299 = 0.82/1
March 2021-March 2022: 65374/57551 = 1.1/1
March 2022-March 2023: 68150/69963 = 0.97/1

Suggestions

- **Pre-COVID Performance Metrics**: Evaluate key performance indicators (KPIs) such as production volume, capacity utilization, operational efficiency, and profit margins.

- **Post-COVID Performance Metrics**: Adapt KPIs to reflect changes in demand, supply chain disruptions, workforce availability, and financial stability.
- **Technology Integration**: Pre-COVID, focus on traditional methods; post-COVID, emphasize digital transformation for remote operations, predictive maintenance, and supply chain visibility.

- **Supply Chain Resilience**: Pre-COVID, supply chains may have been optimized for efficiency; post-COVID, prioritize resilience, diversification of suppliers, and local sourcing.

- **Employee Safety and Well-being**: Shift from standard safety protocols to comprehensive health measures, including remote work options, frequent testing, and mental health support.

Findings

- 1.The outcomes show that in spite of steady decrease in current proportion of both the organizations, Goodbye figured out how to come un track rapidly when contrasted with JSW.
- 2.The outcomes show that in spite of steady decrease in Speedy proportion of both the organizations, JSW figured out how to come on target rapidly as analyzed
- 3.This shows that ISW was capable in meet their long haul external values and imemal values and had the option to keep up with their monetary sufficiency more serenely than contrasted with Goodbye.
- 4.The outcomes show that subsequent to expanding and afterward diminishing pattern ISW performed far better than Goodbye which implies assuming financial backer will put cash in Wipro there contributed sum will be most secure while contrasted and those financial backers wino put resources into TCS.

CONCLUSION

There is no question that the focus level in specific items market, for example, HR curls is critical with the strength of a couple at the top. Be that as it may, there is no proof of formal "arrangements" to fix costs or genuine feeling of the term. The proof of the HR curls makers answering indistinguishably from outer circumstances, for example, changes in worldwide costs and so on isn't adequate enough to be evaluated as hostile to serious.