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# Comparative Study of Job Creation Post-Lockdown in Mechanical Engineering and Computer Science

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*Abstract :* *The COVID-19 pandemic drastically impacted global economies, leading to widespread job losses across industries. As economies recovered, the patterns of job creation exhibited significant disparities across sectors. This paper presents a comparative analysis of job creation in the fields of Mechanical Engineering and Computer Science post-lockdown, with a special focus on India. The study incorporates literature reviews, data collected from companies across multiple countries, and emphasizes the trends observed in the Indian job market. Recommendations for fostering sustainable job growth in these fields are also provided.*

*Keywords -* *'job recovery', 'COVID-19 impact', 'mechanical engineering', 'computer science'*

## I. INTRODUCTION

The COVID-19 pandemic caused unprecedented disruptions in the global workforce. While some sectors adapted quickly to the challenges, others faced prolonged stagnation. Mechanical Engineering and Computer Science, two critical fields, exhibited contrasting trends in job recovery post-lockdown. This paper aims to analyze the factors influencing job creation in these sectors and identify strategies to enhance employment opportunities, particularly in India.

## II. LITERATURE REVIEW

### 2.1 Impact of covid-19 on employment

Several studies have highlighted the adverse effects of the pandemic on employment. According to ILO reports [1], global job losses in 2020 exceeded 114 million, with uneven recovery across sectors. Fields reliant on physical infrastructure, like Mechanical Engineering, faced greater delays compared to digital-centric domains such as Computer Science.

### 2.2 Recovery Trends in Mechanical Engineering

Mechanical Engineering saw slow recovery due to supply chain disruptions and reduced manufacturing demand [2]. However, the advent of automation and Industry 4.0 technologies accelerated hiring in roles requiring advanced skills [3].

### 2.3 Growth in Computer Science

Computer Science experienced rapid growth due to increased demand for digital solutions. The rise of remote work, cloud computing, and artificial intelligence (AI) created a surge in job opportunities [4]. In India, companies like TCS and Infosys led the hiring spree, focusing on software development and cybersecurity roles [5].

### 2.4 India's Employment Scenario

India, with its vast labor force, experienced unique challenges. The manufacturing sector, a major employer, faced prolonged disruptions [6]. In contrast, the IT sector expanded significantly, driven by digital transformation and export demand [7].

# III.    METHODOLOGY

The study employs a mixed-method approach to comprehensively analyze job creation trends in Mechanical Engineering and Computer Science post-lockdown. The methodology includes the following steps:

### 3.1 Data Collection:
- Primary data was obtained from job portals such as LinkedIn, Naukri.com, and Indeed, which provided insights into job postings across sectors.
- Secondary data was sourced from annual company reports, government publications, and industry whitepapers. Reports from prominent organizations like NASSCOM and the International Labour Organization (ILO) were also reviewed to understand macroeconomic trends.
- Specific data points, such as the number of job openings, sectoral growth rates, and skill requirements, were compiled for analysis.

### 3.2 Interviews:
- A total of 25 semi-structured interviews were conducted with industry professionals, including HR managers, hiring consultants, and domain experts from India, the USA, and Europe.
- The participants included 10 professionals from the Mechanical Engineering sector and 15 from the Computer Science field, representing diverse roles such as design engineers, software developers, and project managers.
- The interviews aimed to capture qualitative insights on hiring patterns, skills in demand, and the challenges faced by employers in the post-pandemic landscape.

### 3.3 Sampling Methods:
- A purposive sampling technique was employed to ensure the inclusion of professionals with relevant experience in hiring or workforce management.
- Geographic diversity was prioritized, with participants from metro cities and industrial hubs such as Mumbai, Bengaluru, and Pune in India, along with global technology and manufacturing centers in the USA and Europe.

### 3.4 Data Analysis:
- Quantitative data from job portals and reports were analyzed using descriptive statistics to identify trends and correlations.
- Qualitative data from interviews were thematically analyzed to extract recurring patterns and unique observations.
- Comparative matrices were constructed to evaluate recovery speeds, skill demand, and employer preferences in both fields.

### 3.5 Comparison:
- The trends in job creation for Mechanical Engineering and Computer Science were systematically compared based on recovery speed, skill demand, and major employment areas.
- Special focus was placed on the Indian job market to identify sectoral strengths and weaknesses.

This comprehensive methodology ensures a balanced mix of quantitative and qualitative analysis, offering a nuanced understanding of the factors influencing job creation in these two critical sectors.

# IV.    RESULTS AND DISCUSSION

## 4.1 Global Trends
Mechanical Engineering: Job creation rebounded slower, with growth concentrated in green energy, robotics, and smart manufacturing.

Computer Science: Exhibited robust growth, particularly in AI, cloud computing, and cybersecurity roles.

## 4.2 Indian Scenario
4.2.1 Mechanical Engineering

Companies such as Larsen & Toubro and Tata Motors reported increased hiring in renewable energy and automation roles.

Challenges included a shortage of skilled workers and delayed projects.

4.2.2 Computer Science

IT giants like Wipro and HCL Technologies expanded recruitment, emphasizing AI, data analytics, and software engineering roles.
Startups also contributed significantly, especially in fintech and e-commerce.

**4.3 Comparative Analysis**

Table 1 Comparative Analysis

| Aspect | Mechanical Engineering | Computer Science |
|---|---|---|
| **Recovery Speed** | Moderate | Rapid |
| **Skill Demand** | Specialized (automation, robotics) | Broad (AI, cloud, software) |
| **Major Employers** | Manufacturing and energy sectors | IT services and startups |
| **Indian Focus** | Renewable energy and smart tech | Digital transformation and exports |

## V. RECOMMENDATIONS

1.Upskilling Programs: Governments and industries should invest in skill development tailored to emerging technologies.
2.Policy Support: Policies promoting green manufacturing and digital innovation can boost job creation.
3.Collaboration: Industry-academia partnerships can bridge skill gaps and foster innovation.

## VI. CONCLUSION

The post-lockdown recovery in Mechanical Engineering and Computer Science illustrates divergent trends influenced by sector-specific dynamics. While Mechanical Engineering grapples with structural challenges, Computer Science benefits from the digital revolution. In India, targeted efforts to enhance skills and foster innovation can ensure balanced growth across these fields.

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