

Convergence of CSR and Industry 4.0. Recent Trends in Indian Public Sector Enterprises

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Abstract

Public sector enterprises (PSEs) in India are under constant scrutiny to reduce their excessive burden on environment and labor force, while improving efficiency and effectiveness in a sustainable manner. Advances in manufacturing technologies and automation have forced PSEs in India towards digitalisation of industrial production and creating efficiencies. Consumers of products and services are inclined towards companies that have established Corporate Social Responsibility (CSR) practices towards making societies better and saving lives. This study intends to determine the areas of convergence of Industry 4.0 and CSR in Indian PSEs, which could generate significant economic, environmental, and social benefits. and ultimately, sustainable. Orientating PSEs in India towards industry 4.0 has a direct impact on employees and, finally, on society. For implementing successful Industry 4.0 strategies, CSR policies and strategies of Indian PSEs and its stakeholders must direct their initial efforts in upskilling their employees in order to achieve economic, social and environmental sustainability.

Keywords

Corporate Social Responsibility, Industry 4.0, Public Sector Enterprises, and Sustainability

1. Introduction

Change is inevitable, and when it happens all of a sudden, the term revolution is ascribed to it. The evolution of businesses has occurred through such revolutionary changes, although the processes of change are spread across decades. The first industrial revolution, referred to as Industry 1.0 was marked by the concept of machines and factory system resulting in organized businesses. The second industrial revolution, referred to as Industry 2.0 was largely powered by electricity and management as a science began to take shape. The third industrial revolution or Industry 3.0 built upon Industry 2.0 and was driven by integrated circuit and allied technologies towards efficient, stable, and cost productive operations. Faster processing and internet speed in the recent years were the precursors to the fourth industrial revolution or Industry 4.0. Convergence and integration of big data solutions, cloud services, automation processes, integration technologies, Internet of Things (IoT), cybersecurity systems, additive manufacturing, augmented reality and simulation technologies are the driving forces of Industry 4.0. In order to ensure future growth, it is imperative that organizations embrace and integrate the technologies relevant to the sector in which they operate to become more efficient, more agile and faster Time-To-Market (TTM) for new products and services (Schwab, 2017).

CSR is the set of policies, practices, and programs that augment the relationship between business and society and are integrated into an organization's strategic and operational activities (Bowen, 1953; Carroll, 1999). The primary objective of CSR is not only managing its stakeholders in an ethical and responsible manner, but also in building a better community and a sustainable world. CSR activities and practices adheres legal, economic and ethical principles (Carroll, 1999; Schwartz & Carroll, 2003, Prasad et.al, 2018) and are directed towards the benefit of people, profit, planet, also known as the 'triple bottom line' (Elkington, 1998). Employee well-being, Corporate Governance, Business ethics, conservation of natural resources, community development and environmental protection are some of the prominent CSR areas of attention (Blowfield & Murray, 2008). Meeting current needs without disrupting the future needs is considered sustainable development (Brundtland, 1987) and sustainability is considered a variation of CSR predominantly by mid and large cap companies of oil and pharma sector during CSR reporting (Ihlen, Bartlett, & May, 2011, p. 6). Weder and Karmasin (2011) have proposed a "quadruple bottom line" postulating that ethics and commitment must be understood communicatively, as well.

Prior to 1960s in India, CSR was predominantly a philanthropic activity in which organizations mainly supported the government programs for socioeconomic development. Of late, Indian companies have begun to comprehend the relevance and significance of CSR, as well as understanding their responsibility towards shareholders and stakeholders (Urmila, 2011). The laws governing CSR come under the Companies Act, 2013, and became effective on 1 April 2014. The criteria for a company to compulsorily engage in CSR were; if its net worth was more 500 crore or earned revenue of 1,000 crore or more or if its net profit was over 5 crore during the immediately preceding fiscal, The organization should spend 2% of their average net profit in immediately preceding three financial years on activities related to social development such as sanitation, education, including special education and employment, eradication of hunger, poverty and malnutrition, conservation of heritage, art and culture, and enhancing vocation skills and literacy of children, women, elderly, and the differently abled (Anil et. al, 2019). Prior to enactment of CSR laws, private companies showed a greater predilection towards CSR activities, although no discernible difference was noted between private and public sector after April 2014 (Anil et. al, 2019). Indian companies keep investors informed through official disclosures about their future strategies, not only from financial point of view, but also from an ethical standpoint. Communicating to customers that the organization is socially responsible and ensures the wellbeing of employees and community is a tested measure of establishing credibility and building long lasting relations (Arun, 2020).

Public sector enterprises (PSE) were primarily established to achieve sustainable growth of Indian economy. Since 1948, PSEs have witnessed tremendous growth in size and volume of investment (Jain, 2014, Prasad. et.al, 2020). PSEs in India have strived to achieve high economic growth, a major macroeconomic objective and to maintain stability in balance of payments. Promoting redistribution of income, regional development and creating employment opportunities. were the key thrust areas of PSEs in India. Following the economic reforms of 1991, Indian PSEs began to compete with domestic private sector companies and large multinational corporations, by investing in contemporary technology initiatives and have adopted the various technologies driving Industry 4.0. Thus, the continued focused CSR efforts towards achieving sustainable development have helped several of the PSEs to play a critical role in building the Indian economy and modern India, and moving towards stakeholder capitalism (Arun, 2020). CSR activities have helped these PSEs to develop a stronger Indian economy and promoting sustainable development, a fillip to the image of modern India. Our study was directed towards 5 of these Indian PSEs to assess the convergence of the drivers of Industry 4.0 and the various stakeholders or dimensions of CSR.

2. Materials and Methods

Qualitative data analyses of the official disclosures and interviews of five PSEs were done to understand the convergence patterns of drivers of Industry 4.0 and the CSR activities. Following is the list of companies.

2.1 Indian Oil Corporation Limited

Indian Oil Corporation Ltd (IOCL) was established as an oil marketing entity in 1959. IOCL operates along the entire hydrocarbon value chain – from exploration, production, refining, transportation and marketing of oil and gas and petrochemicals. The company is now actively looking into alternative energy.

2.2 Oil and Natural Gas Corporation

Oil and Natural Gas Corp Ltd (ONGC), incorporated in 1993, is a Maharatna public sector undertaking of the Govt. of India. ONGC's business interests span the entire hydrocarbon value chain and also include renewable and alternative sources of energy. ONGC is engaged in exploration, production, refining, transportation and marketing of oil and gas and petrochemicals with interests in new sources of energy.

2.3 Coal India Limited

Coal India Ltd (CIL) was incorporated in 1974 as Coal Mines Authority Ltd and acquired its present name in 1975. CIL has 7 coal producing subsidiaries and its operations are spread across 82 mining areas, 8 Indian states. The company's key suppliers include 98 out of 101 coal based thermal power plants. CIL also offers consulting services in mine planning.

2.4 Bharat Petroleum Corporation Limited

Bharat Petroleum Corporation Ltd (BPCL) was nationalized in 1976 under the name of Bharat Refineries Ltd, which was changed to BPCL in 1977. BPCL is engaged in the exploration, production and retail of petroleum and petrol-related products. like petrol, diesel, kerosene, LPG, specialty oils, automotive engine oils, and other products.

2.5 National Thermal Power Corporation Limited

NTPC Ltd (NTPC) was incorporated in 1975 and is a major power player with presence in the entire value chain of the power generation business. Apart from generating electricity via hydro, nuclear and renewable energy sources, NTPC offers consultancy, power trading, training of power professionals, rural electrification, ash utilization and coal mining as well.

3. Discussion

Industry 4.0 technologies such as big data solutions, cloud services, automation processes, integration technologies, IoT, cybersecurity systems, additive manufacturing, augmented reality and simulation technologies are mapped against shareholders, employees, suppliers, financial institutions, society, customers, government, law and special interest groups, the dimensions of CSR.

3.1 Indian Oil Corporation Limited

CSR activities directed towards suppliers enabled automation and integration technologies to be implemented. Introduction of automation technologies was perceived as a negative trait and learning technologies introduced through augmented reality did not gather momentum. Simulation of processes showing the measured taken to mitigate environmental concerns was received positively by residents living around the plants as shown in Table 1.

Table 1. Convergence Matrix of Industry 4.0 driver and CSR of Indian Oil Corporation Limited

		Industry 4.0 Technologies								
		Big Data Solutions	Cloud Services	Automation Processes	Integration Technologies	IoT	Cybersecurity Systems	Additive manufacturing	Augmented Reality	Simulation Technologies
CSR dimensions	Shareholders									
	Employees									
	Suppliers									
	Financial Institutions									
	Society									
	Customers									
	Government									
	Law									
	Special Interest groups									

- Convergence with benefits
- Convergence with negative impact

3.2 Oil and Natural Gas Corporation

CSR activities directed towards suppliers enabling integration technologies to be implemented along the value chain was received positively. Introduction of automation technologies was perceived as a negative trait as shown in Table 2. Simulation of processes showing the measured taken to mitigate environmental concerns was received positively by residents living around the plants. Supply chain integration with global partners was viewed favorably by the government. Automation in financial transactions was viewed favorably by financial institutions.

Table 2. Convergence Matrix of Industry 4.0 driver and CSR of Oil and Natural Gas Corporation

		Industry 4.0 Technologies								
		Big Data Solutions	Cloud Services	Automation Processes	Integration Technologies	IoT	Cybersecurity Systems	Additive manufacturing	Augmented Reality	Simulation Technologies
CSR dimensions	Shareholders									
	Employees									
	Suppliers									
	Financial Institutions									
	Society									
	Customers									
	Government									
	Law									
	Special Interest groups									

- Convergence with benefits
- Convergence with negative impact

3.3 Coal India Limited

CSR activities directed towards employees using augmented reality and simulation as part of safety measures was viewed positively as shown in Table 3. Enabling automation technologies while viewed favorably by shareholders did not enthruse employees. Availability of data was received positively by environmental activists and medical fraternity.

Table 3. Convergence Matrix of Industry 4.0 driver and CSR of Coal India Limited

		Industry 4.0 Technologies								
		Big Data Solutions	Cloud Services	Automation Processes	Integration Technologies	IoT	Cybersecurity Systems	Additive manufacturing	Augmented Reality	Simulation Technologies
CSR dimensions	Shareholders									
	Employees									
	Suppliers									
	Financial Institutions									
	Society									
	Customers									
	Government									
	Law									
	Special Interest groups									

- Convergence with benefits
- Convergence with negative impact

3.4 Bharat Petroleum Corporation Limited

CSR activities directed towards customers using automation technologies and cloud-based services was received positively as shown in Table 4. Enabling integration technologies was viewed favorably by shareholders and suppliers

Table 4. Convergence Matrix of Industry 4.0 driver and CSR of Bharat Petroleum Corporation Limited

		Industry 4.0 Technologies								
		Big Data Solutions	Cloud Services	Automation Processes	Integration Technologies	IoT	Cybersecurity Systems	Additive manufacturing	Augmented Reality	Simulation Technologies
CSR dimensions	Shareholders									
	Employees									
	Suppliers									
	Financial Institutions									
	Society									
	Customers									
	Government									
	Law									
	Special Interest groups									

- Convergence with benefits
- Convergence with negative impact

3.5 National Thermal Power Corporation Limited

CSR activities directed towards environmental activists through data transparency was received positively as shown in Table 5. Enabling integration technologies was viewed favorably by shareholders and suppliers. Simulation technologies used as communication strategies was received positively by local communities. Introduction of automation technologies to safeguard life and health was viewed as a threat.

Table 5. Convergence Matrix of Industry 4.0 driver and CSR of National Thermal Power Corporation Limited

		Industry 4.0 Technologies								
		Big Data Solutions	Cloud Services	Automation Processes	Integration Technologies	IoT	Cybersecurity Systems	Additive manufacturing	Augmented Reality	Simulation Technologies
CSR dimensions	Shareholders									
	Employees									
	Suppliers									
	Financial Institutions									
	Society									
	Customers									
	Government									
	Law									
	Special Interest groups									

- Convergence with benefits
- Convergence with negative impact

4. Conclusion

To secure and maintain a contented work force and to act in the best interests of these stakeholders, it is necessary to engage with them before the implementation of Industry 4.0 strategies. For successful implementation of Industry 4.0 strategies in PSEs in India, it is now imperative that employees are provided with opportunities of developing their latent skills through training and education. CSR mandate for the companies in India, insists to align with the sustainable development goals of UN, which in-turn is matching with Industry 4.0 strategies. CSR in India is naturally partnering with Industry 4.0, and the convergence is visible, at many places. As PSEs were the first to move forward with mandate CSR initiatives, the Industry 4.0 will also be spearheaded to its expected visions, effortlessly.

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