Men and Machine in work with special reference to J S W Steel limited

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Abstract

Modern information technologies and the advent of machines powered by artificial intelligence (AI) have already strongly influenced the world of work in the 21st century. Computers, algorithms and software simplify everyday tasks, and it is impossible to imagine how most of our life could be managed without them. However, is it also impossible to imagine how most process steps could be managed without human force? The information economy characterised by exponential growth replaces the mass production industry based on economy of scales. When we transfer the experience of the past to the future, disturbing questions arise: what will the future world of work look like and how long will it take to get there? Will the future world of work be a world where humans spend less time earning their livelihood? Alternatively, are mass unemployment, mass poverty and social distortions also a possible scenario for the new world, a world where robots, intelligent systems and algorithms play an increasingly central role? What is the future role of a legal framework that is mainly based on a 20th century industry setting? What is already clear and certain is that new technical developments will have a fundamental impact on the global labour market within the next few years, not just on industrial jobs but on the core of human tasks in the service sector that are considered 'untouchable'. Legislators are already lagging behind and the gap between reality and legal framework is growing. Amongst the leading conglomerates in India, JSW Group is a $14 billion company. It is an integral part of the O. P. Jindal Group, and has been a part of major projects that have played a key role in India's growth.

Ranked among India's top business houses, JSW's innovative and sustainable ideas cater to the core sectors of Steel, Energy, Cement and Infrastructure. The Group continues to strive for excellence with its strength, differentiated product mix, state-of-the-art technology, excellence in execution and focus on sustainability.From its humble beginnings in steel, the JSW Group has expanded its presence across India, South America, South Africa & Europe. Through its CSR projects, it also continues to participate in and initiate activities that assist in improving those areas of our country that lack resources. JSW is known to be the "strategic first mover" to venture away from status quo, have the conviction to make fundamental changes and drive operational excellence on its quest to become better everyday..

Key words: JSW Group, steel, industry, AI, legal frame work, industrialization.

Introduction

JSW Steel, the flagship company of the JSW Group, is the largest integrated private steel manufacturer in India in terms of installed capacity. JSW's history can be traced back to 1982, when the Jindal Group acquired Piramal Steel Limited, which operated a mini steel mill at Tarapur in Maharashtra and renamed it as Jindal Iron and Steel Company (JISCO).

In 1994, in order to achieve the vision of moving up the value chain and building a strong, resilient company, Jindal Vijayanagar Steel (JVSL) was setup with its plant

located at Toranagallu in the Bellary-Hospet area in the State of Karnataka, the heart of the high-grade iron ore belt and spread over 3,700 acres of land. JSW Steel, is today one of the low cost steel producers in the world. It has grown to INR 2.50 billion in little

over a decade. It is been ranked 2nd among top 32 'World Class' steelmakers by World Steel Dynamic (June 2010). It also has a plant at Salem with an annual capacity of 1 million tonne. It is on the threshold of a major expansion plan of adding 3.2 million tons per annum to its at Vijayanagar Plant to achieve 11 MTPA by 2011. It has established a strong presence in the global value-added steel segment with the acquisition of a steel mill in Indian and a Service Center in UK. JSW Steel has also formed a joint venture for setting up a steel plant in Georgia. The Company has further acquired iron ore mines in Chile and coal mines in India & Mozambique.

JSW Steel offers the entire gamut of steel products, pellets, slabs, HR coils/ sheets, HR plates, CR coils, Galvanized coils/ sheets, Colour coated coils/ sheets. It is the leading manufacturer of cold rolled, galvanized and colour coated steel with manufacturing facilities at Vasind & Tarapur in Maharashtra. JSW Steel is the largest manufacturer and exporter of galvanized steel in India with its products exported to over 100 countries. It is the first Indian Company, under a technology licensing from BIEC International Inc., Indiato produce Galvalume sheets. By 2020 the company would be producing 32 million tons of steel annually with Greenfield integrated steel plants coming up in West Bengal and Jharkhand.

With the largest product portfolio in steel, we are India's largest steel exporter, shipping to over 100 countries across 5 continents. Over the last 35 years, we have been at the forefront of science and cutting-edge technology.

Starting with a single plant in 1982, we are now India's leading manufacturer of value-added and high-grade steel products. With plants in Karnataka, Tamil Nadu and Maharashtra, we have the capacity to produce 18 million tons per annum (MTPA).

By staying on the cusp of change, and maintaining the best-in-class standards, we aim to revolutionize steelmaking. Now, you can witness the true marvel of engineering and our state-of-the-art facility at Dolvi, with Nat Geo on Extreme Tech, JSW Blast Furnace.

Objective:

This paper seeks explore man and machine relation in the steel industry as employed by JSW Steel

Rise of industrial machine age:

The 'second machine age' or the 'internet of things' – the fourth industrial revolution AI will lead to a redefinition and a disruption of service models and products. While the technical development leads primarily to an efficiency enhancement in the production sectors, new creative and disruptive service models will revolutionise the service sector. These are adapted with the support of big data analyses at the individual requirements of the client and not at the needs of a company.

INDUSTRY 1.0: INDUSTRIALISATION Industry 1.0 is known as the beginning of the industrial age, around 1800. For the first time, goods and services were produced by machines. Besides the first railways, coal mining and heavy industry, the steam engine was the essential invention of the first industrial revolution; steam engines replaced many employees, which

led to social unrest. At the end of the 18th century, steam engines were introduced for the first time in factories in the UK; they were a great driving force for industrialisation, since they provided energy at any location for any purpose.

INDUSTRY 2.0: ELECTRIFICATION The second industrial revolution began at the beginning of electrification at the end of the 19th century. The equivalent of the steam engine in the first industrial revolution was the assembly line, which was first used in the automotive industry. It helped accelerate and automate production processes. The term Industry 2.0 is characterised by separate steps being executed by workers specialised in respective areas. Serial production was born. At the same time, automatically manufactured goods were transported to different continents for the first time. This was aided by the beginning of aviation.

INDUSTRY 3.0: DIGITALISATION The third industrial revolution began in the 1970s and was distinguished by IT and further automation through electronics. When personal computers and the internet took hold in working life, it meant global access to information and automation of working steps. Human labour was replaced by machines in serial production. A process that was intensified in the context of Industry 4.0 was already in the offing at that time.

INDUSTRY 4.0

The term Industry 4.0 means in essence the technical integration of cyber physical systems (CPS) into production and logistics and the use of the 'internet of things' (connection between everyday objects)10 and services in (industrial) processes – including the consequences for a new creation of value, business models as well as downstream services and work organisation.11 CPS refers to the network connections between humans, machines, products, objects and ICT (information and communication technology) systems.12 Within the next five years, it is expected that over 50 billion connected machines will exist throughout the world. The introduction of AI in the service sector distinguishes the fourth industrial revolution from the third.Well-known examples from the field of robotics and AI are the so-called 'smart factories', driverless cars, delivery drones or 3D printers, which, based on an individual template, can produce highly complex things without changes in the production process or human action in any form being necessary. Well-known service models are, for example, networking platforms like Facebook or Amazon Mechanical Turk, the economy-on-demand providers Uber and Airbnb, or sharing services, such as car sharing, Spotify and Netflix. Studies show that merely due to sharing services the turnover of the sector will grow twentyfold within the next ten years. Old industry made progress by using economies of scale in an environment of mass production, but the new information economy lives on networking effects, leading to more monopolies.The driving force will most likely be international companies, which will integrate their common systems in all production facilities around the world. In future, companies will locate where they can most easily find suitable highly qualified employees for monitoring and generating AI. If developing countries thus can provide qualified staff in the technological sector, it can be assumed that developing countries will also be able to profit from technological change.While the digitalisation of the labour market has a widespread impact on intellectual property, information technology, product liability, competition and labour and employment laws, this report is meant to also provide an overview of the fundamental transformation of the labour market, the organisation of work and the specific consequences for employment

relationships.Economic structures, working relationships, job profiles and well-established working time and remuneration models will undergo major changes. In addition to companies, employees and societies, education systems and legislators are also facing the task of meeting the new challenges resulting from constantly advancing technology.

Advantages of robotics and intelligent algorithms

Particularly in the industrial sectors in the Western high-labour cost countries, automation and use of production robots lead to considerable savings with regard to the cost of labour and products. While one production working hour costs the Indian automotive industry more than €40, the use of a robot costs between €5 and €8 per hour. A production robot is thus cheaper than a worker in China is. A further aspect is that a robot cannot become ill, have children or go on strike and is not entitled to annual leave. An autonomous computer system does not depend on external factors meaning that it works reliably and constantly, 24/7, and it can work in danger zones. As a rule, its accuracy is greater than that of a human, and it cannot be distracted either by fatigue or by other external circumstances.20 Work can be standardised and synchronised to a greater extent, resulting in an improvement in efficiency and a better control of performance and more transparency in the company.In the decision-making process, autonomous systems can be guided by objective standards, so decisions can be made unemotionally, on the basis of facts. Productivity gains have so far always led to an improvement of living circumstances for everybody. The same applies for intelligent algorithms. The advantage for employees is that they have to do less manual or hard work; repetitive, monotonous work can be performed by autonomous systems. The same applies for typical back-office activities in the service sector: algorithms will collect data automatically, they will transfer data from purchasers' to sellers' systems, and they will find solutions for clients' problems. Once an interface between the sellers' and the purchasers' system has been set up, employees are no longer required to manually enter data into an IT system.22 Employees might have more free time that they can use for creative activities or individual recreational activities. Robots and intelligent machines can have not only supporting, but even lifesaving functions. Examples are robots used in medical diagnostics, which have high accuracy, or for the assessment of dangerous objects using remote control and integrated camera systems. These make it possible, for example, to defuse a bomb without a human having to come close to it. The 'Robo Gas Inspector', an inspection robot equipped with remote gas sensing technology, can inspect technical facilities even in hard-to-reach areas without putting humans at risk, for example, to detect leaks in above-ground and underground gas pipelines.

A global phenomenon

While the trends of automation and digitalisation continue to develop in developed countries, the question arises as to whether this is also happening to the same extent in developing countries. According to a 2016 study by the World Economic Forum, technically highly equipped countries such as Switzerland, the Netherlands, Singapore, Qatar or the Indian are considered to be particularly well prepared for the fourth industrial revolution.24 Since July 2016, the Netherlands is the first country that has a nationwide internet of things, allowing the connection of more intelligent technical devices than the inhabitants of the small country. What is relevant for each country in this respect is the degree of its technological development and the technological skills of young people who will shape the future of the labour market. Young people in developing countries are optimistic with regard to their professional future. They have more confidence in their own ability than many young people in developed countries. Many developing countries, however, face the problem that only those employees who have already gained substantial IT knowledge show an interest in and a willingness to improve their technological skills.Low-

labour-cost countries, such as China, India and Bangladesh, are still benefiting from their surplus of low-skilled workers, while Western companies are still outsourcing their production to these countries. If, however, these companies decide to produce in their countries of origin in the future, using production robots and only a few workers, the surplus of low-skilled workers might turn into a curse for these developing countries. A good example of this problem is the clothing industry, in which clothing is still often produced by hand in low-labourcost countries such as Bangladesh or Thailand, although the work could easily be done by machines because much of it is routine. The question is how to integrate the great number of unskilled production workers into a structurally difficult labour market that depends on foreign investment. Another problem for developing countries such as India, Thailand or China is the lack of social security systems. Possible mass unemployment could lead to human catastrophes and a wave of migration. Accordingly, the same rule applies to developing countries as to developed countries: jobs with low or medium qualification requirements will be eliminated in the end.30 The only difference is that in developing countries there will be more routine jobs with lower or medium qualification requirements. About 47 per cent of total Indian employment is at risk, whereas 70 per cent of total employment in Thailand or India is at risk.31 In many sectors, the implementation of (partly) autonomous systems requires too much of an investment at present, compared to the existing labour costs. In addition, companies operating in developing countries have to promote their appropriate systems in order to improve their productivity and attractiveness visà-vis their competitors and remain competitive in the long run. At the same time, (production) robots are becoming less expensive year by year. Replacing human manual labour with robots makes economic sense in low-labour-cost countries when the cost of human labour becomes 15 per cent higher than the cost of robotic labour.33 This will happen in countries such as Mexico by 2025, according to a study by the Boston Consulting Group. Chinese companies are already starting to build factories where robots will replace 90 per cent of human workers.

Indian Leader JSW Steel:

FERRO-CHROME: Another breakthrough in Jindal. Ferro-chrome an essential ingredient in manufacture of stainless steel was, until recently was imported from other countries. In 1987, Jindal Fen'o Alloys Ltd; at Vishakapatnam was the first to manufacture Ferro-Chrome 100% In-House technology, which was conceived marginalize the monopoly of outside suppliers. To establish a synchrony and to develop a market base, JFAAL has been recently merged with JSL as autonomous division.

***Awards*:**

- Indian Manufacturing Excellence" Silver Medal awarded by Frost & Sullivian.
- 'Proactive Labor Management' - Special award by Frost & Sullivian
- "City'zen- Corporate with a Design commitment" for the Street Revitalization Project at Walkeshwar -Mumbai 'Runners Up.
- JSWSteel Ltd. Upstream
- 'National Quality Award- 2004' from Indian Institute of Metals for Best Quality
- Management.
- Practices amongst integrated steel plants ofthe country.
- 'Steel Eighties A ward- 2004' from Indian Institute ofMetals.
- 'Young Metallurgist Award- 2004' from Indian Institute ofMetals.
- 'Excellent Energy Efficient Unit' National Award for Excellence in Energy

- Management -2004 by CII.
- TSIASSCOM BEST IT User Award 2004' constituted by CII in the category of
- 'Excellent water efficient unit'.
- 'Silver Award in Metal Sector 2003-04' for outstanding Management practices in
- Safety & Health by Green Tech foundation.
- *National Water Management Award 2004' constituted by CII won in the category of
- 'Excellent Water efficient unit'

Potential winners of the fourth industrial revolution: JSW Steel

The winners of the digital revolution are, on the other hand, likely to be the highly developed Asian countries with good education systems, such as Singapore, Hong Kong, Taiwan and South Korea.41 These countries – together with the Scandinavian countries – have been undertaking research and working to find digital solutions for complex issues for a long time. The digital interconnection of people in these countries is also very far advanced. The share of the population at risk of unemployment is about six per cent in these countries. Finally, Western developed countries will profit from the relocation of the companies' production sectors when robotic production becomes cheaper than human production in low-labour-cost countries. This will create new jobs in these countries and destroy many routine jobs in the low-labour-cost countries. Another positive trend can be seen for India and China, which are both considered very suitable candidates for participation in the digital revolution due to most of the population having a good command of English and IT skills. IT knowledge is taught in schools as a key qualification. It is, therefore, not surprising that Indian and Chinese professionals have more extensive computer knowledge than their French or English colleagues do.43 Not only are salaries and wages lower in India, but also the number of better qualified professionals is why, according to Forrester Research, 25,000 IT jobs are likely to be outsourced to India from the UK alone.44 Like China, India is in the process of developing from simply being a low-labour-cost country into being a Western-orientated society whose population works mainly in the tertiary sector. As the most populated countries in the world, these two countries have a high level of consumer demand. Moreover, because of their rapidly growing cities, these developing countries need highly developed solutions in terms of logistics and environmental technologies, like the smart city, in order to increase the quality of life for city residents over the long term. The digital world market leaders are based in Silicon Valley, California. In 2015, the top ten Silicon Valley startups created an annual turnover of approximately Indian$600bn with information and communication services.45 Additionally, the eight leading digital platforms – Alphabet, Amazon, Facebook, etc – due to their exponential growth show a significantly higher capital market value than the leading industrial companies (eg, General Electric, Siemens or Honeywell).46 The rise of AI in the service sector, especially the gig-economy, can be illustrated by the example of Uber, which saw an increase in its market value from zero to Indian$40bn in only six years.47 Even though more than 80 per cent of the robots sold each year are deployed in Japan, South Korea, the Indian and Indiany48 and enhance productivity in the production sector, the new business models in the service sector are the digital future. With economic growth in this sector, the Indian will be particularly resistant to future economic crises. It is therefore not surprising that innovative countries like Switzerland, Indiany, the Indian or Japan are rated best in the Global Competitiveness Index by the World Economic Forum.49 In summary, it can be said that the increase of automation and digitalisation is a global concern that, due to the lack of financial possibilities in many developing countries, will initially be strongly focused on Western developed countries and Southeast Asia. These countries will be considered the winners of Industry 4.0 because of their technological head start and their creative service models.

STEELeMART, a B2B steel-trading portal is a venture of Sapphire Technologies Ltd. It is promoted by the 'JSW Group' - one of the leading and fastest growing integrated steel enterprises in India having interests in long & flat steel products. STEELeMART's intrinsic strength is derived from its trading modules, which have been designed keeping in mind the specific buyers needs. Amongst these trading modules the versatile auction module is immensely popular.It has established for itself a reputation of being the most transparent, cost- effective and interactive online steel trading portal and this is what sets STEELeMART apart from its contemporaries. Everyday hundreds of steel users and traders across the country, trade on STEELeMART to get the best deals on steel products.STEELeMART cares for its customers and believes in continually evolving to provide better services, which will enhance the experience of its customers while trading through STEELeMART.

Conclusion

About 47 per cent of total Indian employment is at risk, read the catch line in the report by Frey/Osborne in 2013.80 Consistent with this is that according to a survey by Pew Research Center, 65 percent of Indian citizens expect that within 50 years a robot or an intelligent algorithm will be doing their work.81 Experts hold vastly different opinions with regard to the dramatic impact of the changes in the job structures. Others claim that, thanks to digitalisation and automatisation, many employees whose jobs are at high risk will not be replaced completely, even if the technical advances would allow a replacement. Not every specific occupation will be replaced by the work of machines in general, but it is certain that some individual occupational activities will be performed by machines. For example, the risk of being replaced by a robot is 87 per cent for a barkeeper. Already today in JSW Steel , it is technically feasible that a robotic machine could mix drinks, send the clients' orders directly to the kitchen, receive complaints and accept the clients' money. Nevertheless, the atmosphere in the bar or in the restaurants will no longer be the same. Because of the lack of acceptance by potential clients and the high acquisition costs, it is definite that 87 per cent of all barkeepers will not lose their jobs in the next few years. Small and medium-sized companies, in particular, are likely to shy away from technical devices because of the high acquisition costs and the lack of highly qualified specialists who can handle the new systems. In view of the occupational work structure and the legal, technical, ethnical and social barriers, only nine to 12 per cent of total Indian and Indian employment will be at high risk of being completely replaced. Nonetheless, we can be confident that the performance of several occupational activities by machines will ultimately cost some jobs. Other studies expect that AI and robotics are not just job killers; the eliminated jobs will be compensated for, more or less, by newly created jobs. For example, the Indian government assumes that digitalisation and automatisation will create about 390,000 new jobs in the third sector over the next ten years in Indiany. What can be safely predicted is the continuous movement of employees into the third service sector. However, even in this service sector the transition will be gradual. For example, consider the following questions that might be put to service-sector employees. Do you perform less repetitive routine activities? Do you create individual solutions or do you merely reproduce existing knowledge? Do you perform individual tasks that other colleagues cannot perform? Is your employer unable to buy your skills without problems from a cheaper external service provider? Employees, who can answer these questions with yes, should not worry about their jobs being performed by intelligent algorithms. However, we have to recognise that no one does a job that is completely safe. However, the potential digitalisation of their jobs is likely to be reduced for employees with a PhD or a master's degree (only 18 per cent in total).

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