The arc of Industry 5.0 bends towards a social purpose

Sudheesh Venkatesh

Abstract: The article argues that industry is coming alive to its social purpose, with considerations like equity, environmental impact, and ethics. It starts with the history of industrial revolutions from 0.0 to 4.0, detailing their impact on society. It goes on to introduce the concept of Industry 5.0, which is built on the principles of human centricity, sustainability, and resilience. The author explains the implications of Industry 5.0 to society, leadership, and HR. He argues that Industry 5.0 is not a revolution but an evolution of the manufacturing process, which is characterised by the integration of various technologies such as artificial intelligence, the Internet of Things, and robotics. He concludes by discussing how individuals can adapt to the requirements of Industry 5.0. The article points to Industry 5.0 becoming more humane with greater responsibility for equity, justice, and sustainability.

This article is in five sections:

1. **The history of industrial revolutions from 0.0 to 4.0**
2. **What these revolutions have meant to people and society?**
3. **What is Industry 5.0?**
4. **What is the implication of Industry 5.0 to society, leadership, and HR?**
5. **How can you and I adapt to the emerging requirements of Industry 5.0?**

1. **The history of the Industrial revolutions:**

0.0: In the 15th century Guttenberg invented the printing press in Germany. Interestingly, he took the idea from a wine press. The printing press created the means for the 'oral tradition' to be replaced by written/printed material. Among other things, this was responsible for the rapid and widespread evangelisation of religion.

1.0: In the late 18th to early 19th century the invention of steam energy by James Watt and later R L Stevenson led to human labour being replaced by steam power. Locomotives, for example, replaced bullock carts. The working conditions of factory workers were often harsh and dangerous, with long hours, low wages, and limited opportunities for advancement. There was exploitation and oppression of workers.

2.0: In the late 19th to early 20th century the invention of electricity, and the widespread use of the internal combustion engine, led to the development of new forms of transportation and communication. Efficiency and production capacity increased manifold and per-unit costs dropped. This for example led to the collapse of the handloom industry with machine-made textiles taking over. Assembly line production was the trend. It created new opportunities for workers in a range of industries. However, the labour market became more competitive. The working conditions of

factory workers remained harsh and dangerous, and workers were subjected to new forms of workplace surveillance and control.

3.0: In the mid-late 20th century came the advent of computerisation and the internet. This revolution is still ongoing with the widespread use of information technology, the automation of many manual tasks, and the development of new forms of communication and collaboration. There have been profound changes in the way work is organized and performed, creating new opportunities for remote work and flexible schedules. Automation has led to job displacement, with the increasing use of gig work, independent contracting, outsourcing, offshoring, and flexible staffing. Very few workers now get secure stable and well-paying jobs with good retirement benefits.

4.0: In the late 20th and start of the early 21st century came the sweep of the internet which led to machines being able to talk to each other. This era of manufacturing is characterised by increased integration of technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), Robotics, and 5G connectivity. So, we have highly automated intelligent manufacturing systems with the widespread adoption of digitization, which has led to increased efficiency, improved decision-making, reduced costs in manufacturing, and new levels of customization for customers. By connecting devices, machines, and systems, IoT has enabled the real-time monitoring and analysis of manufacturing processes, helping manufacturers respond more quickly to changes in demand, and reducing the risk of stockouts and overproduction.

2. What have these revolutions meant to people and society?

Each industrial revolution was caused by the discovery/ invention of a new form of energy (first steam, then electricity, and so on).

Each revolution raised the human development indicators in its wake. For example, during Industry 2.0, Britain's economy grew fifteen times while its population only grew five times, leading to a huge increase in prosperity.

Each revolution also had an enormous impact on human and societal behaviour. For example, in the second revolution, workers would stand in one place and assemble a single part of a car, while till then a craftsman would make the whole bullock cart, with simple tools and work performed primarily by hand.

The argument that these revolutions cause job losses is questionable because, while each revolution displaced traditional jobs there was simultaneous creation of new jobs. It is just that the kind of skills required was different and those who adapted survived.

Unfortunately, each revolution has also increased wastage and harm to the environment because energy became easily available. It was so easy to produce and move things that naturally people did not care to conserve the resources they were consuming.

In my view, 4.0 and 5.0 (which I will come to) in particular are not revolutions but evolution. It is not a dramatic departure from one era and a leap to the next – it is a continuous change with people, countries, and societies living in multiple industry stages at the same time. For example, I may be in 3.0, you may be in 4.0, and those now in school (the digital natives) may be walking into 5.0.

3. What is Industry 5.0?

Now there is talk of Industry 5.0. I am not sure if it is just a fashionable thing to say at conferences. However, Industry 5.0 goes one step further and is built on the principles of a) human centricity b) sustainability, and c) resilience.

Several things have started to come together – Artificial Intelligence (AI), Big Data, Block Chain, Cloud Computing, Machine Learning, and 5 G connectivity for instance.

Let us take some of these to illustrate what it means to industry:

a) For instance, in Industry 5.0 the use of Artificial Intelligence (AI) and analysis of large amounts of data (Big Data) helps the industry predict potential problems before they occur, reducing downtime and saving manufacturers time and money.
b) Similarly, 5G supports the use of augmented reality (AR) and virtual reality (VR) in manufacturing, providing new ways to visualize and control production processes.
c) 3D printing and additive manufacturing processes will reduce waste. For example, in precision tools, the wastage in manufacturing used to be 90%. Now, it will be 0% because the tool will be created layer upon layer.

However, there are also some potential challenges associated with Industry 5.0. For example:

a) Investment in new technologies may be expensive and time-consuming.
b) Likely to lead to job losses for low-skilled workers as machines and systems take over many of the tasks that have traditionally been performed by humans
c) The skills and expertise needed to implement these technologies may not be easy to find.
d) Operations could be subject to cyber threats.
e) The increased use of data and AI in decision-making, will lead to a reduction in the need for middle managers and other administrative positions.

4. What are the implications of Industry 5.0?
a) For society

The benefits:

- **Improved healthcare:** Industry 5.0 technologies have the potential to revolutionise the healthcare industry, by improving the accuracy of diagnoses,

reducing the cost of medical procedures, and enabling remote health monitoring and treatment.

- **Enhanced quality of life**: Potential to improve the quality of life for people in many ways, including through the development of smart cities, the provision of better transportation, and the creation of new leisure and entertainment opportunities.

The concerns:

- **Increased income inequality**
- **Job displacement:** While Industry 5.0 has the potential to create new jobs and increase productivity, it is also likely to result in job displacement, particularly in heavily automated industries.
- **Social and ethical concerns:** The integration of advanced technologies into all aspects of society raises important social and ethical concerns, including the potential for increased surveillance, and the collection and use of personal data.

What are the implications of Industry 5.0?

b) For leaders

Leaders will need to be more adaptive, innovative, and forward-thinking than ever before. They will confront an increased pace of change - like the Moore's Law.

Leaders will need to be able to articulate a clear vision for their organisation that balances financial performance with social and environmental impact. They will need to move from shareholder value to value for all stakeholders (i.e., customers, employees, investors, and communities).

What are the implications of Industry 5.0?

c) **to the HR function?**

Build flexible talent models: With the changing demographics of the workforce, the rise of, remote work and the gig economy, HR leaders will need to be proactive in developing flexible talent models that support the needs of the organisation and its employees. This could include the use of flexible work arrangements, contingent workforces, and project-based teams, and to be more agile and adaptable in its growing.

Growing importance of diversity, equity, and inclusion (DEI) Organizations are looking to HR to help lead the way in developing DEI strategies and programs. This includes everything from recruitment and selection to talent development and performance management and will require HR to be proactive and innovative in its increasing

Increasing importance of employee engagement, employee experience, and well-being. Organisations need HR to develop everything from flexible working arrangements and work-life balance programs to health and wellness initiatives and employee recognition programs developing programs and policies that meet the evolving needs of employees.

Increasing use of technology in HR and importance of data and analytics.

From HR information systems (HRIS) and applicant tracking systems (ATS) to cloud-based solutions and artificial intelligence (AI) tools, technology is transforming the way HR operates. This is leading to greater efficiency and effectiveness in HR processes and is enabling HR to focus on more strategic initiatives, such as talent management and employee engagement.

With the rise of big data and the availability of sophisticated analytics tools, organisations are gaining new insights into their workforce and can use this information to make better decisions about their talent strategy. For HR, this means a greater emphasis on data-driven decision-making, with the use of data analytics and metrics to inform everything from hiring and talent development to performance management and compensation.

Focus on reskilling and upskilling the workforce. Providing training and development programs to help employees adapt to the new demands of Industry 5.0.

5. How can people (you and I) adapt to the requirements of Industry 5.0?

We will need digital skills such as data analysis, programming, and digital marketing, among others.

In addition, soft skills such as communication, teamwork, problem-solving, and critical thinking will become even more important. As companies rely on technology to automate routine tasks, we will need to focus on more complex and creative tasks, which require the development of these soft skills.

We must adopt a growth mindset. This means being open to change, embracing modern technologies and methods, and continuously seeking out new learning opportunities. With the rapid pace of technological change, those who are flexible and adaptable will be better equipped to thrive in the new industrial landscape.

We will need cross-disciplinary education, experience in different industries, and exposure to diverse cultures and perspectives.

We may work less than now. We may have 3-day work weeks, leaving us more time for leisure, family, and even a side hustle.

As Charles Dickens said…"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us…"

We stand at the cusp of Industry 5.0, and it is ours to seize the moment and bend the arc towards a social purpose.

Sudheesh Venkatesh is the Chief Communications Officer and Managing Editor at Azim Premji Foundation