



zensar



Industry 5.0

A must-focus component in strategy maps of Hi-Tech & Manufacturing businesses.

White Paper



Executive Summary

Technological progress has been steadily separating the roles of humans and machines. This has been especially noticeable in the manufacturing and hi-tech industries. But rapid developments under the Industry 5.0 umbrella promise to change. The tenets of Industry 5.0 aim to bring man and machine closer, unlocking the potential of a new type of collaboration. This collaboration will extract more value from existing Industry 4.0 investments and spell a welcome new era in hyper personalization, superior optimization and in creating a safer and more sustainable world.

The last few years in manufacturing have been dominated by Industry 4.0 technologies. Strategies have been fashioned to leverage Industry 4.0 elements such as connectivity, IoT, data, automation and analytics to create actionable insights. Smart factories have begun to proliferate as a result of implementing Industry 4.0 strategies. Smart factories have brought welcome change by accelerating innovation, giving rise to revolutionary product and service customization, improved customer relationships and better security. Now, the next revolution in the form of Industry 5.0 is here. Over the next few months, Industry 5.0 will become central to board room discussions in the manufacturing and hi-tech sectors that have traditionally leveraged automation to replace human labor. Reason: Forward-looking businesses know that the future lies not in replacing human labor but in building a positive relationship between machines and their workforce.

To drive man-machine collaboration, businesses must fuse technological precision with human cognition. Gluing the two will be the tenets of Industry 5.0. A key goal of the manufacturing

industry is to provide better control to humans over production processes. The industry also wants to enhance the value it extracts from investments made in Industry 4.0 technologies. Both goals can be achieved by Industry 5.0 processes and technologies.

Industry 5.0 is already garnering attention and making headlines. In early 2021, the European Commission formally released a document titled **“Industry 5.0: Towards a Sustainable, Human-centric, and Resilient European Industry”**. The document explains the pivotal nature of Industry 5.0 and how it complements existing Industry 4.0 strategies and investments.

Although there is rising interest in Industry 5.0 technologies, COVID-19 delayed investments in them. The last two years saw organizations putting all their energy and focus into digital. There is hardly a business that has not invested in digital tools to enhance collaboration, build remote immersive experiences, deploy avatars, digital twins or co-worker bots.

One impact, of the digital transformation that is underway, is of special interest to hi-tech and manufacturing businesses. Digital has brought about a growing acceptance of dark factories where production is managed through remote human supervision. The extreme levels of intelligence and automation used in remote processes frees humans to leverage their creative potential. The human workforce now has the time to be more inventive in the way it improves processes and solve problems.

The benefits of Industry 5.0

Manufacturing and hi-tech industries stand to see a range of benefits from bringing pinpoint focus to man-machine collaboration. These benefits would primarily trickle down to the areas of user experience, production efficiency, business model flexibility, and compliance:

Experience driven

Mass production to mass personalization:

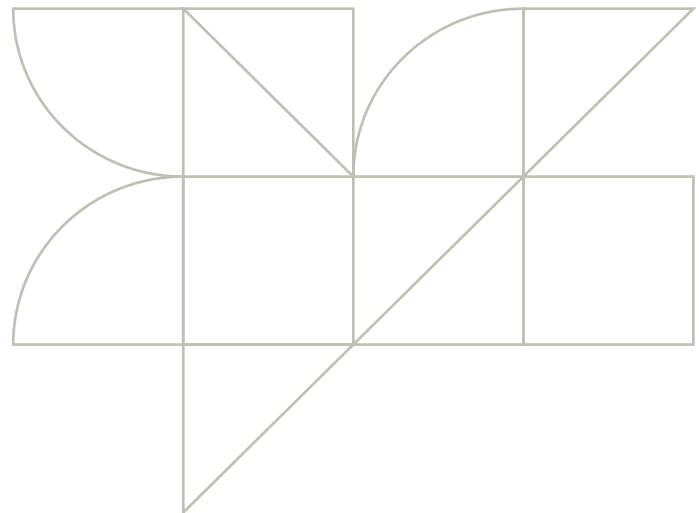
Assembly lines and automation have been extensively used to standardize products for high-volume production at optimal cost. Industry 4.0 technologies strengthened the ability to standardize processes. However, **consumers today demand personalization and employees want better experience with the tools, technologies and applications they use. Industry 5.0 will deliver the personalization that consumers and employees demand.**

Moving from SLAs to XLAs:

There is a major shift underway from SLAs to XLAs (experience level agreements). A simple example provides the reason for the shift: A tool may meet its uptime SLA but fail to create the desired experience or outcome. This makes XLAs important. XLAs focus on the measurement of outcomes or the value created by a product, process or service. Industry 5.0, that creates intuitive, intelligent and contextually relevant interactions between man and machines, will be critical to achieving the shift from SLAs to the more relevant XLAs.

Attracting and retaining talent through associate experience:

With a human-centric approach, the human workforce will not have to invest time and effort in repetitive tasks. These employees can then be upskilled to deliver high value. Organizations that invest in Industry 5.0 will, as a consequence of higher job satisfaction, be able to attract and retain talent more easily.





Improved efficiency

Improved overview of maintenance:

Unplanned downtime in the manufacturing and hi-tech industries results in the **loss of productivity which can be up to 20%**. With the scarce supply of skills, tools and spares that compound the problem, the ideal solution is to move from preventive to predictive maintenance. Connected edge devices in an Industry 5.0 environment can predict equipment failure, allowing the organization to make the appropriate skills, tools and spares available before the breakdown. Maintenance can be planned without affecting production.

Sustainability:

The environmental impact of manufacturing is under acute scrutiny. Manufacturers are becoming conscious of their duty to lower stress on natural resources and build restorative, regenerative and circular processes.

Industry 5.0 processes make it simpler to develop models that enable reuse, recycling, repair, sharing and leasing existing products to address optimal material use, global warming, erosion of biodiversity and increase in pollution.

Technologies and processes such as additive manufacturing, refurbishing, and personalization associated with Industry 5.0 will reduce resource waste and improve resource efficiency.

Human efficiency and productivity:

Industry 4.0 connected complex moving parts of businesses such as supply chains, plant floors, ERP, regulators, external partners, and customers. It brought visibility into processes

across and outside the organization, enabling teams to work collaboratively. Now, the connected and intelligent systems themselves can work with the human workforce to improve efficiency and productivity. For example, temperature, humidity and image sensors in a cookie factory can monitor product quality, prompting operators to adjust production parameters in real time instead of waiting for the results of interval-based quality tests.

Collaborative robots:

Two types of bots—both, hard and soft—will appear more frequently (and in larger numbers) on production floors. These bots will supplement human capabilities. Think of them as cobots (or collaborative bots). Hard cobots will take over repetitive, stressful and dangerous processes such as moving heavy loads or operating equipment in a paint booth where pollution levels can endanger or restrict human presence. The cobots will be supervised by humans. Soft cobots will be deployed to assist employees carry out non-core high-volume tasks in areas such as finance, administration, testing, and program management that have traditionally been error prone or have an irregular demand for labor. Scalable cobots will create a new type of hybrid and fungible workforce that improves the life of legacy investments, delivers new capabilities to employees at scale and keeps employee morale high. Future businesses will be judged by the employee-to-bot ratio they present in their annual reports, making it easier to attract talent.



Flexible, new business models

Servitization:

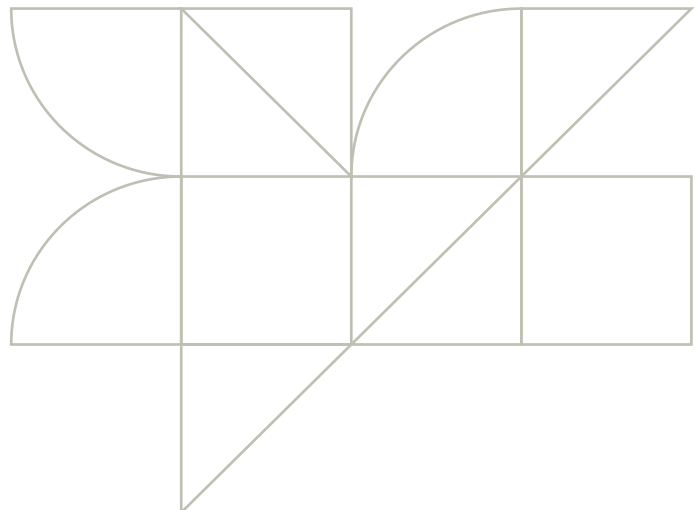
The opportunities to create new servitized business models, at the hands of Industry 5.0, is immense. With a potential to create new revenue streams, manufacturing companies are focusing on delivering solutions rather than products. With a human-centric approach, Industry 5.0 aims to focus on collaboration for sustainable value co-creation—enabling services-led revenue for the manufacturing industry. Businesses may choose to not invest in infrastructure, instead pass it over to OEMs, reducing technology overheads. Subscriptions and pay-per-use models for services will allow businesses to stay agile and respond to changing customer needs without long implementation times and prohibitive costs. Industry 5.0 will increase the momentum towards XaaS (Anything as a Service), encompassing maintenance, packaging, marketing, experience and ancillary services. As an example, predictive maintenance discussed earlier in this article can be servitized. Instead of the business investing in sensors, databases, and predictive technology, predicting downtime can be handed over to IoT and machine learning specialists, reducing technology overheads. The hi-tech industry need not make upfront investments in software. Instead, it can subscribe to software and platforms, without the need for investing in software maintenance or upgrades. Subscriptions and pay-per-use models for services will allow businesses to stay agile and respond to changing customer needs without long implementation times and prohibitive costs. Industry 5.0 will increase the momentum towards XaaS encompassing maintenance, packaging, marketing, experience and ancillary services.



Efficient Compliance Controls

Greener solutions:

Today, the world is focused on recycling or upcycling waste. Industry 5.0 technologies will prevent waste itself through improvements in quality, eliminating the need to recycle or upcycle. Data-driven intelligence will allow plant operators and managers to make more accurate decisions that bring down waste, identify green supply chains, and introduce more efficient processes. This is a major shift in approach. An example of Industry 5.0 technologies reducing waste can be found in the airline industry. The latch for tray tables in an aircraft break from use. Over time, production of a particular tray table and its latch can be discontinued by the manufacturer. To keep their aircraft in service, airlines buy and store an inordinately large amount of the latches as spares (especially if the aircraft is going out of production). Many of the replacement latches are flown across continents to be used in maintenance operations, adding to the carbon footprint of the airline. 3D printing can eliminate this problem, allowing the airline to download the STL or OBJ file for any latch from the manufacturer and print the exact number of latches it needs on-site.



Drivers of Industry 5.0

Once manufacturing and Hi-Tech leaders see the outcomes of deploying the Industry 5.0 paradigm, Embracing it will become simpler. An example from the healthcare industry helps understand this. Imagine having to train healthcare workers in warzones. In many such locations across the developing world, it is difficult to find qualified surgeons to impart the training. Technologies like virtual reality (VR) can overcome this challenge by providing immersive training.

Foolproof, a Zensar company, and One Shot Immersive **have achieved this**. They developed a product to train workers in “conflict, austere and security constrained areas” **using VR**, “empowering people to save lives”.

A slew of technologies such as VR, mixed reality, cobots, gesture recognition, 3D printing/ additive manufacturing, human-centered AI, intent-based machines, and natural language processing (NLP), that have been steadily mainstreaming

over the last decade are witnessing an uptick in adoption now. We already know the immense traction witnessed by VR, thanks to the COVID-19 pandemic. Every organization has whole-heartedly adopted virtual meetings. The **VR market** is estimated to grow at a CAGR of about 48.7% between 2021 and 2026. Similarly, the **NLP market** is forecasted to grow at a CAGR of 26.84% between 2020 and 2026.

The signs of Industry 5.0 dominating the next decade of growth are already around us. The resulting man-machine collaboration will set in motion a more personalized, safer and sustainable world. It will change the business landscape by bringing back re-injecting the human touch into the manufacturing and hi-tech industries.



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