

VTT

Industrial dream jobs

A human-centric future
for industrial jobs

beyond the obvious



Introduction: How to make industrial jobs more attractive?

Industrial work is changing. The main drivers of transformation are the digital and green transitions, which push companies to invest in technology and sustainability. At the same time, there is increasing pressure to remain competitive while global material shortages are impacting many industries.

Other phenomena play a part in the transformation of work as well. For example, since the beginning of the COVID-pandemic, millions of people have quit their jobs globally. In addition, the aging workforce in many developing countries is creating labour shortages. How can industrial companies reduce labour shortages and entice people to continue their industrial careers when there are many other exciting options? In addition, there is massive competition for future talents in several fields. How can the industry attract the next generation of workers?

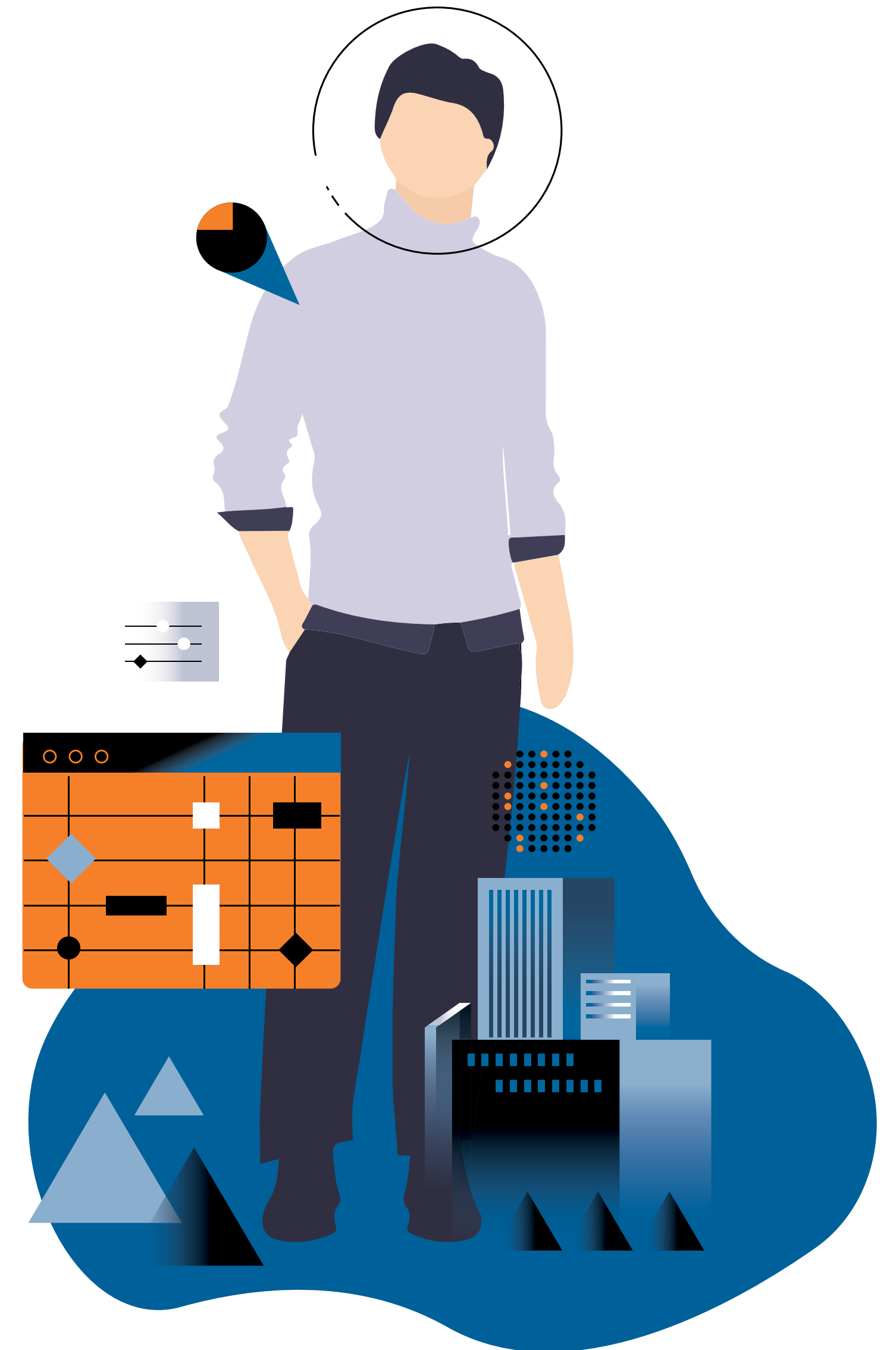
However, the future doesn't have to be bleak.

Advances in digitalisation, AI, and new robot co-working solutions, among others, could enable more enjoyable and meaningful industrial jobs for the next generation.

To combat the flight of employees and to attract future generations, a human-centric approach is needed. This means gaining insight into the actual work of individuals through studies, observation, and data-driven research. The purpose is to identify opportunities to make tasks more engaging and attractive. In addition, it is essential to design flexible solutions so that they can adapt to the user's preferences on where and when to carry out the work, using various interfaces ranging from traditional ones to novel virtual technologies. Right now, it is usually the worker that is forced to adapt to the tools.

Many people today expect their job also to match with their individual values. Therefore building different aspects of sustainability into jobs is essential in attracting future talent. In the long run, a happy worker is an efficient worker. Flexibility and job satisfaction increase productivity.

It is crucial to proactively co-design new industrial dream jobs that motivate and empower workers. At the same time, these jobs drive productivity in all human centric domains from manufacturing to logistics, maintenance and construction. As examples of future dream jobs, we've created six employee personas. They are fictional but realistic depictions of tomorrow's industrial jobs. We hope they can act as an inspiration in helping industrial companies to imagine a bright future.



INDUSTRIAL DREAM JOB 1

Eduardo, Cyber Ethics Manager

“I love working with ethical questions in cyber security because it’s a field that has become increasingly important in our company’s everyday life.”

As the role of digital assets and networks becomes critical to manufacturing, cyber security and ethical questions in working with shared information become vital for all companies.

Eduardo, 33, works as Cyber Ethics Specialist for a multinational packaging manufacturing company. He has been interested in computers and hacking since he was young. He got his first bug bounty at only 15, so a career in cybersecurity felt like a natural progression from this hobby.

Eduardo was recruited to the company around six months ago to oversee its cybersecurity strategy. He was especially interested in this position because ethical questions had been prioritized in addition to the more traditional cyber security questions. These past few months, he has been busy assessing the company’s overall cyber security risks and setting guidelines for the ethical use of network data. One of the goals has been to establish the company’s first bug bounty program for its smart packaging tracking system.

With the foundations of the cybersecurity strategy in place, Eduardo is moving more and more towards management and training best practices in sharing inter-company data in the whole value network. As the company has started developing smart packaging, the extended organization from the factory floor to partners and vendors needs to be familiar with the new policies Eduardo is setting in place.

Just last week, Eduardo was alerted by AI about anomalous user behaviour in the network. As Eduardo quickly isolated the impacted systems, it looked like the risk affected two of their partner companies operating in the same network. He immediately contacted his colleagues in the affected companies to prevent the spread of any confidential information. Eduardo was acknowledged by the partner company for his quick actions because there was a real risk of losing data that could harm them if leaked.



Eduardo’s work:

- Determine coherent and proportional strategies to deliver and manage security operations across data, platforms, production systems, networks, integrations, etc.
- Define the best behavioural practices that must be adopted by every user of the shared data systems
- Identify and take care of any ethical concerns related to the inter-company data sharing and AI development
- Determine the guidelines and train people to prevent personal and organizational privacy harm when dealing with confidential information
- Assess the needs and levels of data transparency needed in different parts of the organisation, such as operations, sales, services, etc.
- Advance the issues and practices of cyber ethics by participating in, e.g., security alliances and industrial ethics groups

INDUSTRIAL DREAM JOB 2

Connie, Data-Driven Supply Manager

“The best part of my work is that I get to be in contact with people from all over the world.”

As supply chains become more and more like partner networks with digital threads, new expertise is needed to guarantee a flexible and sustainable flow of goods.

Connie, 27, has an engineering degree specialising in logistics. She spent her youth living in an apartment overlooking the harbour of Hamburg. Perhaps that is why she has been curious about the transport and movement of goods since she was very young.

Today, Connie works as a Data-Driven Supply Manager. As a very outgoing person, Connie likes that most of her work is social. She works with suppliers, vendors, and partners practically daily. The meetings are primarily virtual, as she works as a part of the global pool of experts.

Right now, Connie is about to start leading a new project. The goal is to dramatically reduce the number of spare parts in her employer’s main production sites since they plan to close their warehouses. To achieve this goal, Connie will adopt data-driven tools capable of collecting and analysing real-time maintenance data from the sites, warehouse inventory, the spare parts supplier’s inventories, and the logistics partner’s data. Different AI tools will help her identify the supply network’s bottlenecks and predict the need and availability of spare parts.

She is determined to make a real business impact with the project – to move from warehousing to an on-demand self-optimizing supply network and improve the company’s sustainability.



Connie’s work

- Manage and develop self-optimizing end-to-end supply chain processes
- Ensure alignment in business objectives, network strategies, agreed procedures, and sustainability goals between suppliers, vendors, and partners
- Investigate new big data storage and sharing and distributed analytics solutions
- Enable network alignment with shared and visible real-time data across the network
- Search and evaluate new suppliers to join the network
- Encourage and manage collaboration and shared rules as the community owner of key supply network processes
- Identify and manage risks with business impact analyses and reviews for compliance

INDUSTRIAL DREAM JOB 3

Ashley, Digital Manufacturing Engineer

“I enjoy problem-solving: using clues from data to solve real-life problems.”

As manufacturing systems create more and more data, data analysis capabilities are needed to make that data actionable.

Ashley, 31, is an experienced data analyst. He works as Digital Manufacturing Engineer with a multinational company owning and operating multiple factories around the world, but new technologies allow him to work at a location of her preference, though he does most of her work from home. At home, he uses a real-time digital twin of the production line. With his VR headset, ergonomically designed with human sensing based features enabling extensive use, he can make adjustments more quickly and co-work with his colleagues in any of the factories.

As a very detail-oriented person, Ashley enjoys continuous testing and perfecting of complex variables. A large factory is his dream environment, as there are always more details to measure and optimise. Ashley is driven by his desire to reduce the use of raw materials and energy in the mill without compromising production quality and efficiency.

In his spare time, Ashley enjoys playing computer strategy games. Like his work, the games are all about testing and observing how small changes can have a significant impact. In fact, Ashley chose his career path to be able to follow his passion in strategy games.

Recently, Ashley’s company has been developing a new quality policy. As they are about to enter mass production, Ashley has been hard at work optimising all the variables of the production line to ensure consistent quality and minimal use of raw materials.

First, he has run several simulations on his computer. When the actual tests start, he integrates various quality control sensors into different production phases. These sensors give real-time values of the quality. Ashley can immediately see the changes in colour codes in his model. He adjusts the parameters for optimal quality so that the production line can adapt autonomously. Ashley is a real expert in creating new algorithms to solve unexpected quality problems.



Ashley’s work

- Identify opportunities and plan actions to increase efficiency and productivity in manufacturing operations, processes, and systems.
- Balance the manufacturing process optimizations with insights from environmental impact data
- Minimise equipment downtime and failures by analysing the self-optimizing production system and product quality data
- Improve product quality across manufacturing systems by overseeing the autonomous quality management system to prevent production errors
- Investigate new measurement technologies, data storage and sharing solutions, real-time, distributed analytics, and cyber security
- Support instrumentation, connectivity, control, and analytic solutions around manufacturing equipment and operational assets

INDUSTRIAL DREAM JOB 4

Sharon, Proactive Maintenance Data Specialist

“I enjoy taking on new challenges – it feels great to take the lessons I’ve learned to new facilities.”

New data sources and algorithms enable artificial intelligence to predict equipment failures. Although most systems are self-healing, sometimes, human interventions are needed. In those cases, AI suggests maintenance activities, and specialists can either agree with the plan or make changes if required.

Sharon, 64, has decades of experience in computer science. She is always curious about finding new ways to measure things and using those measurements for optimisation.

In her work as a Proactive Maintenance Data Specialist of a paper mill, Sharon uses sensor, analytic, and real-time diagnostic data of the production assets. Her role is to develop new algorithms for artificial intelligence to predict asset performance and maintenance needs over time.

Once a year, the mill undergoes a production downtime. Sharon was hired by the company thanks to her long experience in reducing downtimes. Sharon could already squeeze the downtime to five days this year – only her first year on the job – down from seven last year. Thanks to Sharon’s proactive analytics setup, equipment failures can be accurately forecasted or even prevented. There’s less and less under or over maintenance.

Recently, Sharon collaborated with Ashley in the design of a production line for a new paper quality. Sharon’s expertise was helpful already in the design phase. She was able to make suggestions that would reduce the maintenance costs of the production line, such as the choice of equipment and how they are placed.



Sharon’s work

- Improve asset reliability and performance with predictive technology solutions, management systems, and work practices
- Reduce unplanned downtime and maintenance interruptions by developing new algorithms and data sets for artificial intelligence
- Drive continuous improvement in asset availability and performance with different optimization tools and testing various options in simulations

INDUSTRIAL DREAM JOB 5

Oscar, Super Hands-on Maintenance Specialist

“My passion is to keep our products in use for as long as possible.”

Manufactured goods are increasingly embedded with prognostics systems to gain information about their use and wear. However, some manual maintenance work is still needed.

Oscar, 40, hates that in the modern world, too few things can be fixed when they break. As a hobby, he even enjoys repairing consumer electronics like HiFi audio systems.

This dedication is probably why Oscar became a Super Hands-On Maintenance Specialist at a smart door company. He wants to learn how companies are using the new smart doors, how they are breaking, and how they could be used longer. Oscar's company is keen on building outstanding products and long customer relationships rather than simply making more products.

Most of Oscar's work is to fix or update the doors' features manually. Because there are some precise sensors, embedded electronics,

and complex mechanical components, he often collaborates with specialists from different fields through immersive collaboration workspace. In communication with other experts, Oscar likes to use AR glasses that he chose to match his style because he uses the glasses in his free time too.

For example, last winter, Oscar got an alert from a shopping mall. A door was not working as expected. He travelled to the mall and noticed that there was a mechanical problem that he was able to fix by himself. He also saw that the sensors collecting information about the space and people flow were sending incorrect information. Oscar is not working for the sensor company, so he put on his AR glasses and got help from a certified expert representing the sensor company through a collaboration workspace. Together they were able to fix all the problems during this one visit.



Oscar's work

- Act as the general maintenance expert of smart products
- Fix the products manually on site
- Cooperate with experts in several fields (e.g., electronics, networks, sensors, mechanics)
- Help other maintenance experts through different digital systems from his office or home
- Analyse product performance and diagnose product failures with analytical models and historical and real-time data

INDUSTRIAL DREAM JOB 6

Laura, senior assembly specialist

“I am important to my company because my expertise is needed when we produce customised and more expensive products for our customers.”

Laura, 52, is a senior assembly specialist in a medium-sized manufacturing company. When Laura started working at the company 30 years ago, most of the assembly work was done manually. Today, the factory has completely changed – many digital technologies have emerged on the factory floor, and the main production line is automatized.

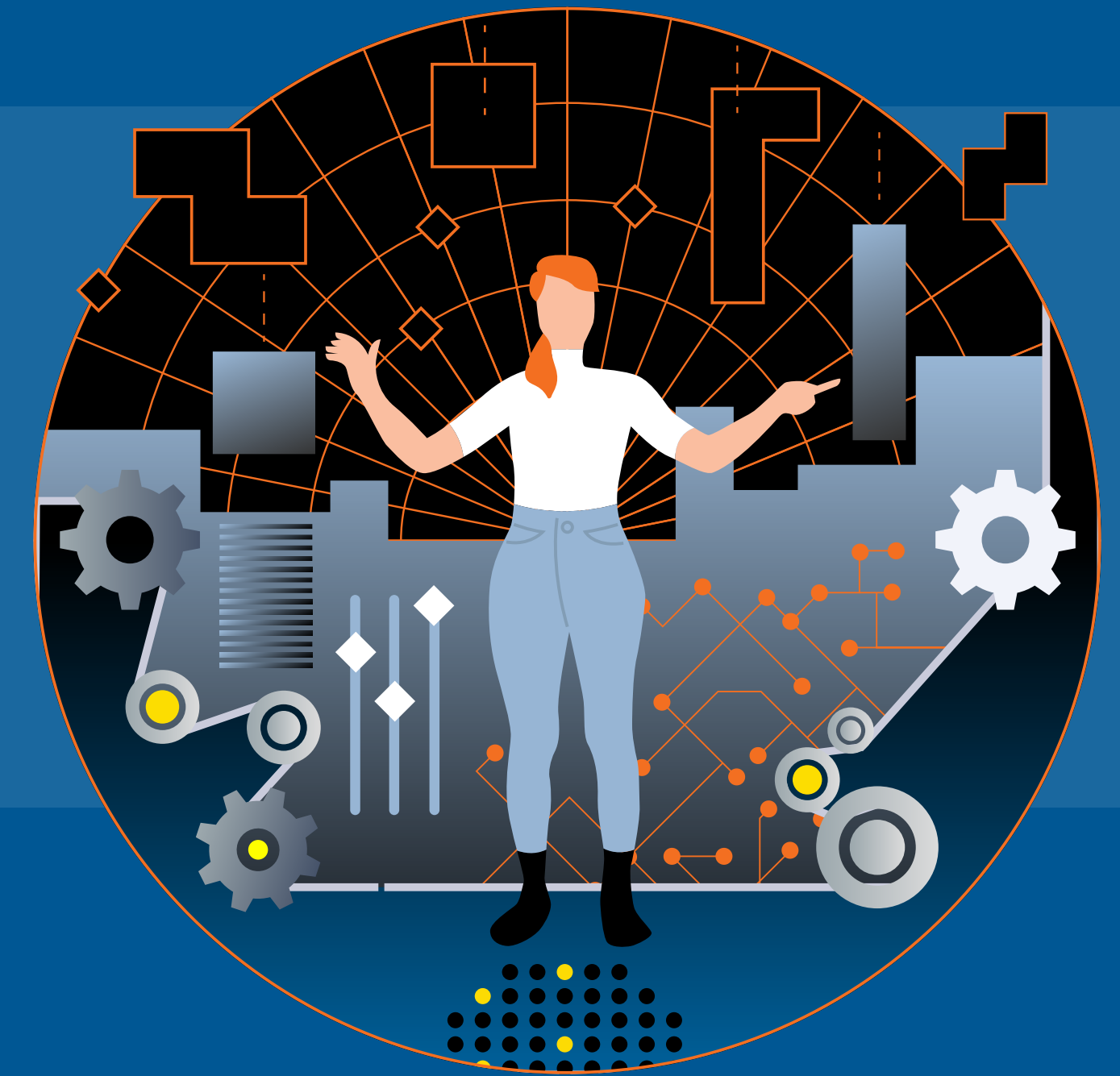
During the past few years, the company has increased the use of automation and robots. The technologies help Laura to perform her daily tasks. It feels normal to co-operate with other workers with the help of the technologies.

In the factory, the robots are responsible for repetitive assembly work, dirty welding tasks, and transportation of assembly parts. However, the company also produces customised products; therefore, flexibility is needed in the production line. Laura enjoys

her role as a senior assembly specialist because she has a vital role in assembling customised products.

Today, she assembles a product from a frame that a welding robot welded. She adjusts her workplace to suit her and takes assembly parts from the AGV robot that has delivered them to her.

Laura often uses augmented reality (AR) projections to remember tricky phases in the assembly task. She has also learned to enjoy the artificial intelligence (AI) system behind the assembly guidance because it acknowledges her expertise after working 30 years in the factory. Due to the use of an AI system, AR-based guidance shows only complex assembly steps related to customised products that Laura does not know beforehand. Sometimes Laura applies a robotic arm to help her assembly work. Sometimes she does the work together with another assembly specialist.



Laura's work

- Assemble customised products
- Design and optimise her work schedule for the week based on her personal preferences and background
- Takes part in improving the production line functions and supporting tools. She gives feedback and suggestions on improving the performance of, e.g., robots, AI, and AR systems.
- Pays attention to how the work is designed to support smooth teamwork within human-technology teams
- Help solve minor problems that may occur within the automated robot assembly line
- Takes part in the design and content creation in the AR assembly guidance
- Gives guidance to installation and maintenance departments if they need help with the products

Creating industrial jobs that people will love

Are you interested in exploring the future of industrial jobs in more detail? Get in touch, and we'll help you to create sought-after jobs in the decades to come.

For further information, watch the video and visit [the Transformation of industrial work page](https://www.vttresearch.com/en/ourservices/transformation-industrial-work):

<https://www.vttresearch.com/en/ourservices/transformation-industrial-work>



Our process for understanding how people work today and how that will shift tomorrow:



1) Current state analysis

Based on observations, interviews, surveys, and focus groups, we will create a current state analysis of the factors, both technical, regulatory and financial ones, affecting employee well-being and the experiences and expectations of workers.



2) Future vision

We will collaborate and refine a future vision of what makes your organisation a great place to work, how work is organised, and what kind of roles are available in 2030 and beyond.



3) Roadmap and detailed plan

We will help you outline potential development paths toward the visions. Roadmap includes also specifications and roles for potential 3rd party collaboration partners in development and deployment. We will create detailed plans of the most potential development paths.



4) Solution creation

We will develop technological solutions for your organisation's specific needs. We will define, develop and demonstrate unique solutions for your work environment.

Get in touch with us

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