

The Future of Maintenance: **A Practical Guide** **to Maintenance 5.0**



INFRASPEAK

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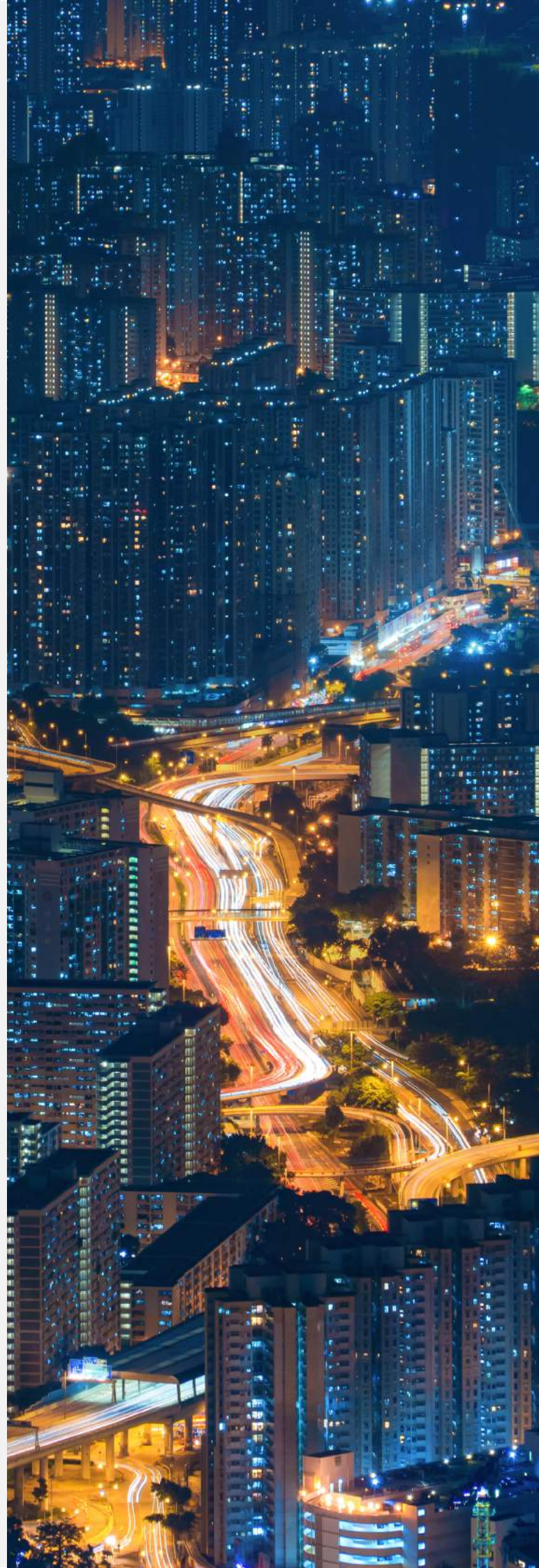
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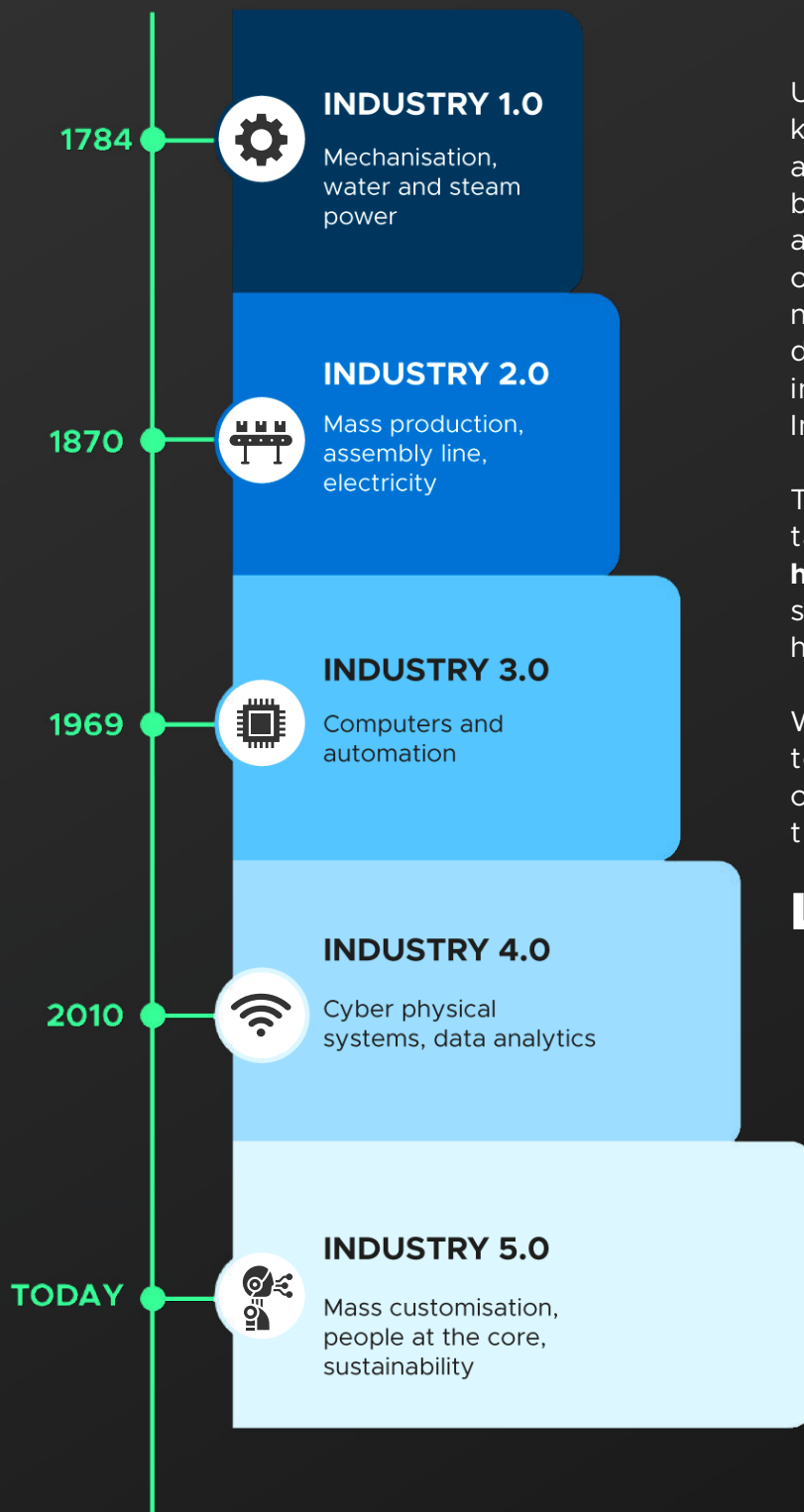


Industry 5.0

...wait, but hasn't the 4.0 just started? What else could be coming our way so soon? Except it hasn't "just" started. The expression "Industry 4.0" was actually coined in 2011, and 10 years is a lifetime in our day and age.

Industry 4.0 put cyber-physical systems front and centre. Automated machines, automated plants, automated everything. Beware, the robots are coming for you. They'll take your job. Brick and mortar, RIP. If these sound like prophecies of gloom to you, you're not alone. Lots of people have felt cut off from this robotic, septic scenery.

Indeed, one could argue that technology got the best of us in the last few years. We've been hostages to the latest tech, trying to catch up with each new buzzword and promising gadget. Shouldn't it work the other way around? Shouldn't technology make things easier, simpler and safer for us? Shouldn't it give us more free time?



Unless you've just met us, you already know what we think about that here at Infraspak. We spend day and night building the most flexible platform to adapt to your business's needs and operations. We want to remove all the noise you'd be getting on a regular dashboard and offer you all the integrations you can think of through Infraspak Hub™.

That is precisely why we need to talk about **Industry 5.0**, which puts **humans** back at the core, interacting seamlessly with software and hardware.

What does it look like, and which technologies should you be looking out for? How is maintenance rising to the challenge?

Let's find out.





What is Industry 5.0?

Over the last decade, the expression “Industry 4.0” became a synonym for the 4th Industrial Revolution, which saw the emergence of cyber-physical systems. It also became a synonym for the profound digital transformation we’ve experienced. Technologies that were once considered “disruptive” like cloud computing, NFC, wireless sensors, or IoT are well-established in our day to day. We’re more connected, factories are more automated, and there’s less downtime than ever before.

At the core, Industry 4.0 was all about mass production and maximum efficiency. **The goal with Industry 5.0 is to achieve mass customisation, deliver a good customer experience, and see the return of manpower to factories.** It’s widely believed that it will increase sustainability and resilience, an idea that gained even more traction during the pandemic. According to the European Commission:

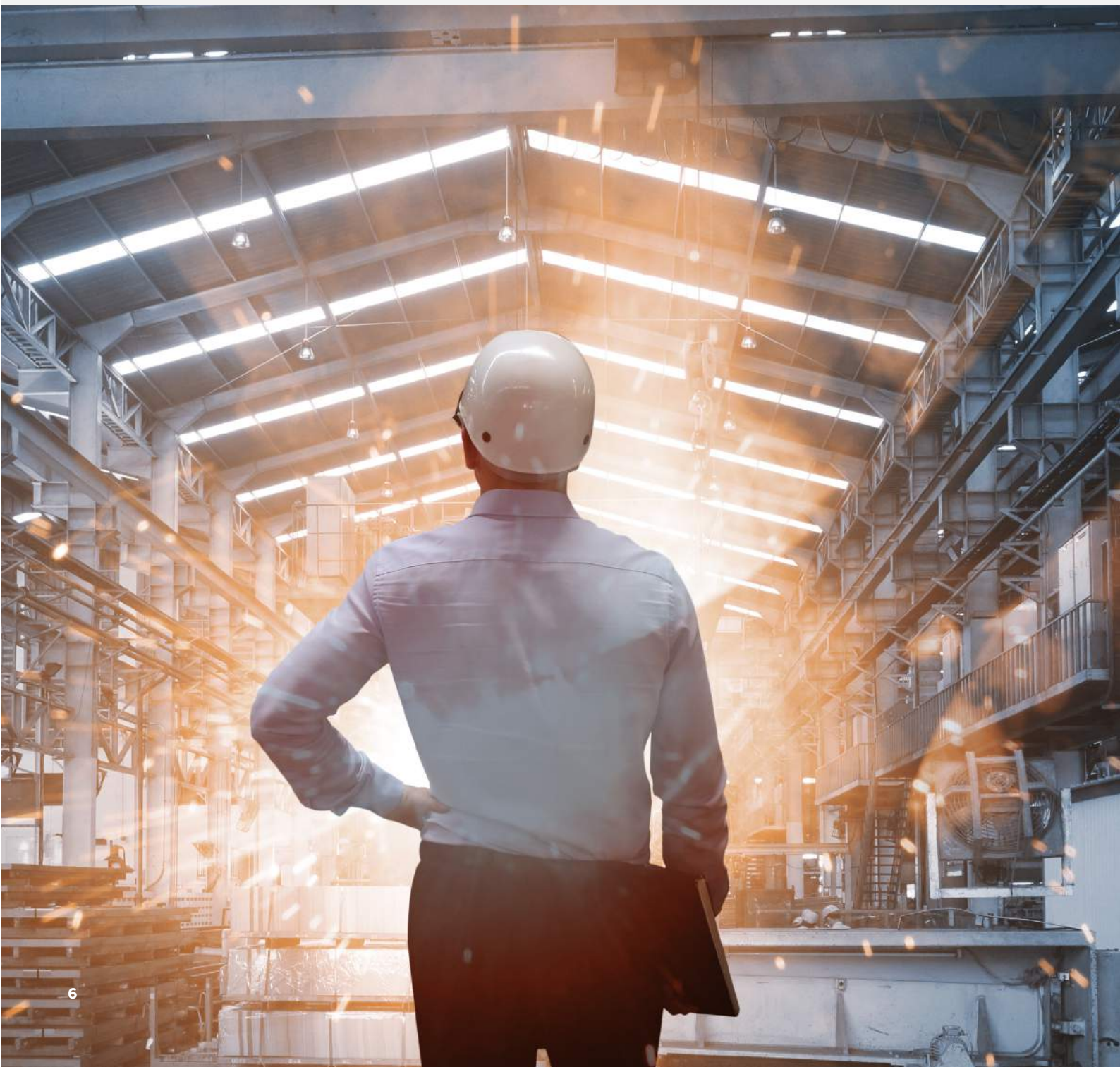
“Industry can help achieve societal goals beyond jobs and growth, and become a resilient provider of prosperity.”

– Industry 5.0: Towards a sustainable, human-centric and resilient European industry



Instead of constantly running after technology, the idea is to make technology work with us. **Humans and machines are paired like co-workers** to increase efficiency, integrate workflows, avoid waste, improve logistics, and create high-quality custom products. Industry 5.0 also brings sustainability to the forefront, with human-based 6Rs: **reconsider, refuse, reduce, reuse, recycle, and repair.**

The hyper customisation of Industry 5.0 can be applied to digital drugs (before you get the wrong idea, they're sounds that are capable of changing wave patterns and sending the brain into a state of meditation), personalised medicine, smart fashion, and intelligent transportation systems. Plus, contributes to developing further concepts like smart factories, innovative ecosystems, and the green economy. **The big question is, how is all of this coming about?**

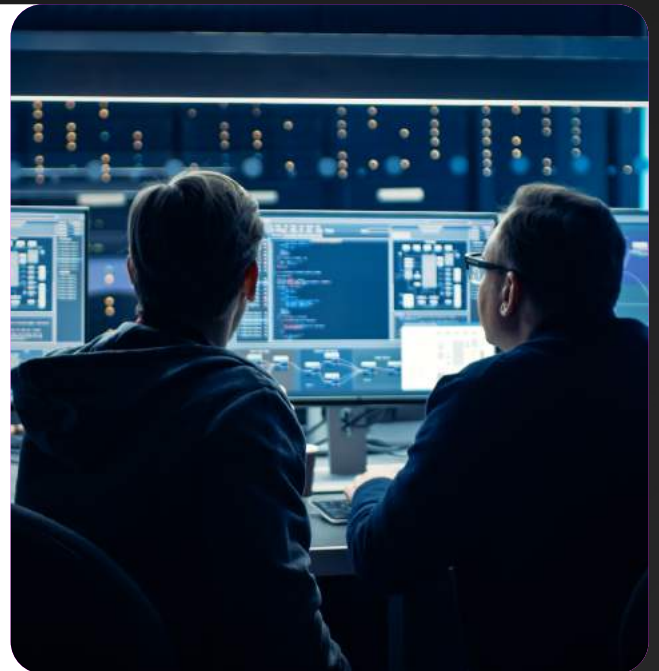


The main technologies enabling Industry 5.0

While it is true that Industry 5.0 prioritises customisation, the achievements of Industry 4.0 won't go away. With the lessons we've learnt, it's safe to say it will be all about "maximum customisation at the lowest cost and maximum accuracy". These are the six main technologies supporting Industry 5.0.

EDGE COMPUTING

It's generally assumed 5G and faster networks will be enough to power real-time apps and decrease latency. Spoiler alert: they won't, and that's where edge computing comes in. "Edge" will bring storage closer to the data sources, which will impact response times and require less bandwidth, finally allowing billions of devices to be connected at the same time. The goal is to end latency, enabling real-time apps, connected assets, and smart homes/facilities.



DIGITAL TWINS

Digital twins are a virtual representation of a physical object or process. They will improve product design, leading to fewer faults and, hopefully, fewer failure modes too. In our particular maintenance and FM bubble, we'll likely use them to make risk assessments (for example, to perform an FMEA) or to simulate how a repair needs to be carried out. Digital twins are expected to reduce production costs and boost predictive maintenance.

COLLABORATIVE ROBOTS

Robots are not a threat – they’re an asset. Collaborative robots (or “cobots” for short) will increase productivity, robustness, and enhance technician dexterity. Among these cobots we’ll find:

- **super-strength operators** (operators + exoskeleton)
- **augmented operators** (operator + AR)
- **virtual operators** (operator + virtual reality)
- **healthy** (operator + wearable tracker)
- **smarter** (intelligent personal assistant)
- **collaborative** (operator + collaborative robot, like an assistant)
- **social** (operator + social networks)
- **analytical** (operator + big data analytics)



INTERNET OF EVERYTHING (IOE)

The Internet of Things (IoT) is a network of connected physical devices. And, for the most part, it’s already the world we live in. The Internet of Everything (IoE) expands beyond “things” to include people, processes, and data. Within this next-generation IoT, we expect to improve asset productivity, reduce downtime, cut down costs, and develop “reflective intelligence”, which is the whole system’s ability to self-manage, self-monitor and self-modify.



BLOCKCHAIN

We've talked about potential applications of blockchain outside of cryptocurrencies for ages, but they never seem to materialise when it comes to maintenance and facility management. Industry 5.0 may change that for good, using blockchain as a method of decentralised management. For example, it will be possible to set up a "smart contract" and a "shared ledger" between you, your customers and your providers.



6G (AND BEYOND)

Implementation of 5G may just have started, but intelligent 6G networks are already underway. They will probably have a complex layered architecture to optimize performance, support augmented and virtual reality better, and enable knowledge discovery (data is reconfigured or recategorised to produce new explicit knowledge). Much like Industry 5.0, Nature Electronics predicts 6G will be "human-centric".

Of course, these technologies all need to interact with one another to make it work. But you'll be happy to know that Repsol, for example, is already employing a mix of blockchain, cyber-physical systems and robots to automate tasks and "alleviate physical presence" in dangerous sites, thus protecting its workers. And that's what Industry 5.0 is all about.



Reality check: what are the challenges of Industry 5.0?

SECURITY & PRIVACY

Technology also has downsides. Arguably, the three biggest challenges we will face are security, reliability, and privacy. According to a 2018 study:

89% of companies have data security and privacy concerns regarding predictive maintenance.

We can only assume they will have the same reservations regarding any software that requires data collection and data analysis, fearing it might make them vulnerable.

There is no easy fix for these problems since cybersecurity is ever-evolving and digital structures need their own maintenance too. One thing we advise you to do is to check the whole supply chain – make sure every supplier and software provider has a secure firewall and ensures data protection. **Don't be shy to include it in the contract or in the SLA.**

SKILLED WORKFORCE

If robots take over labour-intensive tasks and humans do all the thinking, we'll need a **skilled workforce**. In fact, maintenance managers are already struggling with the lack of skilled personnel; Industry 5.0 will only exacerbate the problem.

Only:

29%

of facility managers consider their technicians “very prepared”,

31%

of companies outsource because “skilled individuals are hard to find”,

41%

of manufacturing companies see “the lack of resources or staff” as their biggest challenge.

Upskilling is the obvious solution for these problems, but not the only one. Apart from **continuous training and taking time off work to train these new skills, managers also need to make sure every technology they decide to invest in suits their teams**. Software shouldn't be ‘stiff’ anymore. It should be flexible, customised to each operation, and intuitive. Likewise, onboarding should be as thorough as possible.

REGULATORY COMPLIANCE

If we're making Industry 5.0 human-centric and sustainable, **countries will probably try to pass legislation to enforce worker's rights, regulate human-robot coworking, and agree on a “Green Deal”**. Since supply chains are global, these industry standards need to apply worldwide and companies need to commit to Sustainable Development Goals.

However, this also puts **pressure on businesses to be more transparent** about their business practices. Tracking data about your operations, as well as blockchain (which makes records impossible to change), are two great starting points. When it comes to FM and Maintenance, you can count on integrated software to generate reports you can share with stakeholders.



What does Maintenance 5.0 look like?

With Industry 5.0 becoming a reality, maintenance follows suit. Maintenance 5.0 will likewise follow a human-centric approach, in harmony with software and hardware. It's increasingly customisable to each facility and equipment, safer and more intuitive for technicians, and less disruptive of normal operations.



INTEGRATED MAINTENANCE

It's impossible to seek harmony between people and software without comprehensive tools. Maintenance 5.0 relies heavily on integrated platforms accessible to managers, technicians, end users and intelligent devices. This centralises preventive maintenance plans and reactive work orders – either generated by humans or by the system itself – which means every task is accounted for. The information collected during day to day operations flows seamlessly to generate automatic orders from providers, send invoices to clients, and connect maintenance to the company's wider goals.

PREDICTIVE AND PRESCRIPTIVE MAINTENANCE

Predictive maintenance is predicted (no pun intended) to become a cornerstone of Industry 5.0, along with IoT and cloud computing. But we'll argue this triad is already key for companies who seek efficiency and reliability. According to a 2018 report, European companies who transitioned to **predictive maintenance increased availability by 9%, decreased costs by 12%, reduced safety, environmental and quality risks by 14%, and extended asset lifetimes by 20%.**

However, predictive maintenance will become more accurate, and other technologies will enable its evolution towards **prescriptive maintenance**. Prescriptive maintenance is cognitive, and it **relies on your maintenance data (like records, condition-monitoring information and predictive algorithms) to run "what-if" scenarios.** It then provides suggestions to avoid losses and downtime.

Besides, **maintenance will likely evolve into another AI-implemented, AI-enabled process, anchored by big data analytics and set up with the help of subject matter experts (SMEs) and consultants.** This will probably look like an expansion of what we currently know as "Maintenance-as-a-Service".

And which technologies and trends support Maintenance 5.0?

IOT, CLOUD COMPUTING, AND AUTOMATION

Technologies like the Internet of Things (or its natural evolution, the Internet of Everything [IoE]), cloud computing and automation will continue to leave their mark on maintenance software. We're proud to say Infraspark was the world's first NFC-powered, cloud-based intelligent maintenance management platform. And, after the birth of our **intelligent engine Infraspark Gear™**, we're literally geared up for Industry 5.0.

About Infraspark Gear™

Infraspark Gear™ is our platform's intelligent engine. The Gear consolidates all your data and transforms it into intelligent suggestions, alerts and task automation. For example, it suggests suppliers, automatically assigns technicians to a work order and warns you if there's an asset you've overlooked.

AGILE SUPPLY CHAIN

Businesses should be able to track the location and condition of each part, analyse data, and optimise their warehouse space and inventory better. Efficient logistics enable maintenance teams to avoid waste in unnecessary waiting, transportation, and motion.

ADDITIVE MANUFACTURING

Additive manufacturing (or 3D printing) might be one of the most disruptive technologies to supply chains. Instead of waiting for a part to arrive, providers might send you a 3D model to print on your own facilities. Besides, it opens lots of possibilities for customisation, which is what Industry 5.0' is all about.

CUSTOMISABLE INTELLIGENT MAINTENANCE MANAGEMENT PLATFORMS (IMMPs)

Connecting all your devices and sensors using IoT is a good start, but it's not enough to be "agile". IMMPs allow you to integrate maintenance software with other tools (e.g. business intelligence, accounting, communication or analytics tools) to create data flows, increase efficiency and spot improvement opportunities.

COGNITIVE CYBER-PHYSICAL SYSTEMS

Cyber-physical systems (CPS) are the backbone of Industry 4.0, but their cognitive sibling will blend technology and physical components better. Expect greater resilience due to their ability to self-adjust to variations and self-optimize for disturbance, along with collaborative decision-making with humans.

WEARABLES

Wearables are nothing new. However, their potential to be used in maintenance remains untapped: smart fabrics (for example, UV protective clothing), robotics suits for superhuman strength, or even smart glasses that give technicians step-by-step instructions on how to assemble and repair an asset.

VIRTUAL AND AUGMENTED REALITY

Virtual and augmented reality can create immersive experiences and interfaces for technicians, which helps them to simulate repairs and make a previous walkthrough. Apart from this practical approach, VR and AR can also revolutionise training and onboarding.

COBOTS

Cobots differ from robots in the sense that they are true human companions. Because they are extremely cognitive, they can sense and understand human presence. The goal is to use these 'cobots' for repetitive and labour-intensive tasks and free our human brains for customising products and critical thinking. In the future, every maintenance technician may work along with its own cobot.

EXCELLENT AND COMPUTERISED CUSTOMER SERVICE

It wouldn't be fitting if the change was only technical. Industry 5.0 is human-centric, so we'll need to push for greater and faster customer service. We're continuously improving our own Infraspark Direct™ to allow customers to report failures, request quotes, and start repairs right away.



Beyond 5.0

Did you think we were done? Not quite. After 5.0, there will be an Industry 6.0, an Industry 7.0, and enough revolutions to last until the Sun becomes a red giant star. What the future has in store is still anyone's guess, but we'll bet on the massification of quantum computing, new regulations regarding human-machine co-working policies, global industry standards, and yes, the rise of robot rights too. And we're here for it!



Conclusion

Industry 5.0 has already started, and its intention is clear: to bring humans back to the forefront, to use technology for the greater good, improve the way we interact with it, and achieve a greater work-life balance.

Maintenance and Facility Management, which share responsibilities in creating safe and comfortable environments for people, must be included. It might be too early to tell which emerging technologies will revolutionise our industries for good, but there's no doubt that they must be intuitive, user-friendly, and flexible.

We've come a long way from the age of pen and paper, reports and Excel sheets, and maintenance as an afterthought. As we take on a new approach to business, maintenance software needs to connect seamlessly to every part of your operations.

At Infraspeak, we're proud to have built the first Intelligent Maintenance Management Platform (IMMP). A dynamic ecosystem where you can choose the apps, add-ons, and integrations that best suit your operations – all available remotely and on the go.

Every day, we strive to expand this ecosystem even further, allowing you to integrate more software and connect to more devices. Whatever Industry 5.0 may bring, we will continue to make sure that these technologies have a place in our platform.

Welcome to the Intelligent Maintenance Revolution!

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About Infraspak

Infraspak is an Intelligent Maintenance Management Platform (IMMP) that brings outstanding connectivity, flexibility and intelligence to your operation.

Gain full control and the flexibility to build your own, custom, maintenance management solution capable of answering your own operational challenges.

Online. Offline. Behind a desk or in the field. Infraspak connects your team to your plans, your plans to your goals, and your goals to the intelligent maintenance you need to take your operation into the future.

Talk to our team of specialists and enter a world of data, intelligence and automation

Intelligent maintenance starts here.

[Learn more](#)

The image shows a woman in a white hard hat and orange safety jacket looking at a tablet. Overlaid on the background is a large screenshot of the Infraspak software interface. The interface includes a navigation bar at the top with links like Home, Apps & Add-ons, Integrations, Editor's Pick, and What's New. The main content area displays a list of 'Interventions to perform' with details for 'Fridge' (Daily Routine) and 'Chiller' (Simple Routine and Quarterly Routine). A 'Durations' table is also visible, showing labor time, time to approve, and time to start. A notification banner at the bottom states: 'This Work Order has tasks with unusually... To review them, please go to the Financial...'. On the right side of the interface, there are charts and graphs, including a bar chart and a line chart, and a section titled 'Maintenance Trends and challenges for 2022'.



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