

# DIGITAL WORKERS: HOW TOMORROW'S BUSINESS IS DONE TODAY

Drive productivity, safety and satisfaction for the technology-enabled worker



Manufacturing organizations, automotive & aerospace industries, oil & gas companies, and utility providers are all facing increasing economic pressures on multiple fronts

- **Customers** expect higher service levels and quality than ever before, and they demand rapid delivery
- **Regulators** and industry agencies continue to impose strict rules around safety, operational practices and financial transparency
- Hard-working **employees** want to use the latest tools, technologies and practices that enable them to perform at their best
- **Complex system integration** requires collaboration and effective sharing of information
- Stiff **competition** means businesses must operate as efficiently as possible to keep costs low and protect margins

In order to address such challenges, these organizations typically turn to technology to transform operations and working practices from traditional methods and relying on manual processes to technology-enabled models that foster continued business growth. Part of this means providing today's employees with connectivity, enabling collaboration, and leveraging data to empower them to succeed.

Digital transformation is not just about introducing new technologies; it also involves training and implementing new processes and working practices to get the most out of these investments. Many organizations are employing a shared digital services model, whereby technology resources are adapted and allocated as needed to support specific business needs and use cases. To succeed, these organizations must ensure that the resources they invest in are flexible and can evolve to support a never-growing variety of use cases. Further consideration must be made to work with employees to drive behavioral and cultural change within the company.

## The Digital Worker Advantage

As part of its global Digital Manufacturing offering, Sogeti High Tech, the division of Capgemini and Sogeti dedicated to Industrial Engineering and Technological Innovation, has developed the Digital Worker solution in collaboration with software vendors and startups. This solution focuses on the 'people' part of the digitally transformed manufacturing landscape, and is designed to empower employees to work smarter, faster and with less hassle in a flexible, proven, or even more secured working environment. Using next-generation technologies such as Augmented Reality (AR), Virtual Reality (VR), the Internet of Things (IoT) and the latest hardware and software innovations helps provide workers with a reliable connection to data, information and guidance they need to perform each task, even when working remotely. Digital Worker also allows them to collaborate more effectively with colleagues at any time, from anywhere and with any device.

The Digital Worker offering provides manufacturing organizations with solutions that span the entire product lifecycle, from initial development using simulations to on-site maintenance of deployed assets. Based on the X-IoT Capgemini platform that supports IoT, AR/VR services and supervision tools, this future-proof environment is ready to integrate with your current, legacy and future systems as needed, fitting smoothly into existing infrastructure and long-term business strategies.

The flexibility of the solution enables teams to allocate combinations of resources as needed to each business unit or new project, depending on specific requirements. This makes the solution well suited to IT functions looking to provide digital workers with practical and helpful data from both within and outside the organization.

Capgemini and Sogeti recognize the importance of supporting and enabling quick user adoption when introducing a new solution to the workforce. For this reason, the Digital Worker offering comprises not only the latest technology but also an in-depth, tailored support and training module to ensure employees are engaged with new technologies from the outset, so the organization can gain value from its investment as quickly as possible.

## Digital Worker Use Cases

The Digital Worker model can be applied to a wide variety of use cases, which span three key areas:

### 1. Collaborative Robotics

The traditional robotics model focuses on replacing humans in favor of automated processes that use machines designed to perform specific tasks.

Sogeti High Tech's vision for robotics is different. Its 'collaborative robotics' platform and associated services enable humans and multi-purpose robots to work side by side, relieving the digital worker of repetitive or even risky tasks by equipping them with robotic 'tools' that allow them to focus on adding value to processes and products.

This shift from task-oriented robotics to scenario-oriented, 'as a service' solutions is enabled by the Sogeti High Tech platform that harnesses artificial intelligence (AI) enabled by the cloud and developed with partners such as Intel and IBM.

Use cases available today include:

- An AI system enables robotic arms to repeat tasks when a digital worker technician physically guides the arm and demonstrates the action required for the first time. This is enough for the robot to immediately learn and understand the 3D space it is working in and the position of objects and people. The robot can share the task with other machines in the network, and learnings are also shared between units as the task is performed and perfected.
- Airbus has integrated a [collaborative robotics solution](#) into its test bench workflows, running simulations and tests on aircraft and helicopter controls faster than any human worker.
- For systems needing to be tested under various conditions, perhaps with multiple switches in different on/off combinations, a robot can adjust the switches while the digital worker monitors the results from their work station and makes adjustments as required. Using the robot accelerates the process and the human operator is spared the repetitive strain and associated risk of intervening in the test themselves.
- Even the testing of mobile applications can be improved by using a robotics solution to simulate the actions of an end user while the digital worker monitors system performance and connectivity.

Sogeti High Tech first helps manufacturing customers to understand the value of automation for their specific use cases through its consultancy services. Then, through its framework of assets and solutions, Sogeti shares its learnings with customers resulting from many years spent undertaking hundreds of real life robotics deployments.

Cognitive APIs allow the Sogeti High Tech platform to connect modular operational software and data analysis solutions and unify them to create a centralized and transferrable 'skillset' that is not locked in to a particular robotic device. This intrinsic skillset can be deployed

A natural gas transmission system operator used the Digital Worker solution to streamline workflows and cut paper work. Each time an operator went out to work, their manager would prepare a print-out of the specific workflow steps that should be followed. New comers often found these directions difficult to follow and were at risk to commit mistakes. The company worked with Sogeti High Tech to create an application that allows managers to create a software simulation of the workflow, instead of writing it out on a paper.

Now, the manager can send this simulation to the operator, who views it on their mobile device as they carry out the work, following along step-by-step. The manager can also supervise the working real-time, providing an extra layer of support for field workers to ensure that the task has been completed accurately and to a sufficiently high standard. As a result, lead time for complex maintenance operations performed by a typical pair of field operators has been reduced from one full day to half a day, allowing twice as many operations to be performed per month.

anywhere and at anytime. Seamless IoT connectivity also enables continuous monitoring of the machine's condition and security, as well as the safety of its human counterpart, where ever appropriate.

## 2. Improve Efficiency in Maintenance and Operations

Whether they're checking on a piece of equipment in a large factory or fixing a piece of gas pipeline in a remote forest, field workers spend a lot of time on the move. Often they are miles away from their office and colleagues, meaning they must have all the information they need with them wherever they go. Traditionally, this meant carrying a laptop with a satellite phone and/or lot of paper work in the form of records, guidance and reference materials. They also need to create a clear record of any maintenance they carry out, which means going back to the office and typing up scribbles, fleeting memories, and paper notes made on-site.



These manually intensive processes create inefficiencies and frustrations for workers, and increase the chances of errors or multiple trips to the same site, especially if the field worker does not happen to have predicted exactly the information they needed before they left for a job.

[Know more](#) about our capabilities Robotics and Cognitive

A digital worker equipped with a connected mobile device or 2-in-1 device can overcome these issues by accessing whatever system, database or application they need, exactly when they need it. They can then make all their notes and reports directly into the right application and so remove the need to type their paper work later. The solution therefore enables the organization to:

- **Ensure digital continuity** by easing the interaction between design and/or engineering teams and the plant/field operators
- **Streamline quality inspection** by enabling managers to compare “as designed” scenarios with “as built”
- **Enhance on-floor manufacturing processes** with richer and more in-depth recording, producing more enriched and optimized activity data
- **Ensure traceability** and access to documentation on the floor
- **Secure and monitor critical operations** by allowing managers to supervise complex workflows while minimizing the number of personnel on-site

### 3. Improve Accuracy and Reduce Risk

Even the most highly skilled workers sometimes face challenges. While working on a particularly complex task or following a new workflow, they may need to check their progress from time to time and ensure that, if any mistakes are made, they are rectified at once and not left to cause bigger problems later.



By integrating AR into the manufacturing process, organizations can help these operators stay on track and avoid mistakes. In 2017, Capgemini [announced](#) it had joined forces with DIOTA, the European leader in AR software solutions, to offer AR services as part of its Digital Manufacturing offering. Thanks to this partnership, Capgemini and Sogeti High Tech developed a solution that uses AR to project schematics and guidance on an asset that an operator is working on. For example, when a worker performs maintenance on a reactor, and to ensure every action is carefully monitored, his team can project a digital mock-up of the reactor on top of the actual equipment, and highlight next steps in real-time, right down to the specific hole where a screw needs to go. Actual real-time engineering data feeds these activities, leaving minimal margin for error.

Manufacturing organizations can use the Digital Worker solution to enhance accuracy and mitigate risk by:

- Simplifying complex assembly processes and reducing delays or complications caused by mistakes
- Locating, tracking and guiding field operatives in dangerous areas

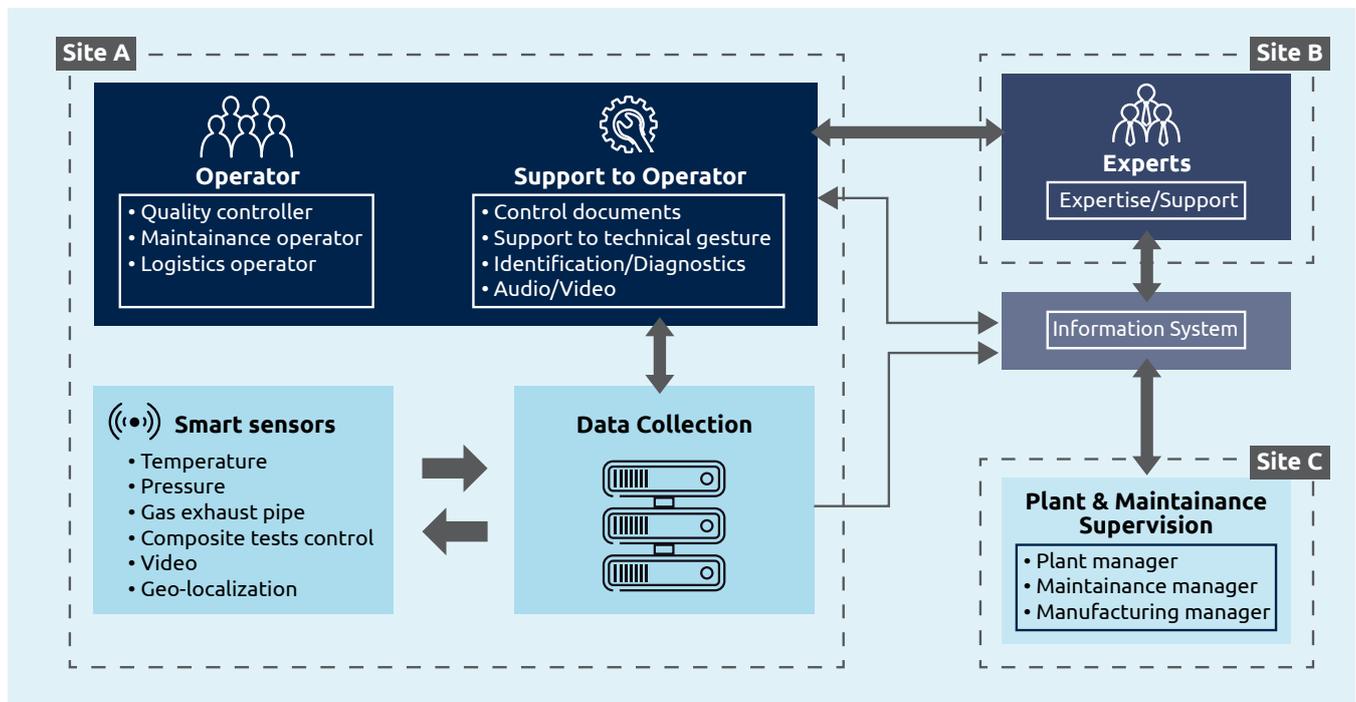
[Discover](#) how can real time 3D and Augmented Reality accelerate and secure the assembly of satellites.

#### **4. Facilitate Communication and Collaboration**

When working on large-scale manufacturing projects, timing is critical. Production deadlines need to be met and down time must be minimized. This means that if an operator has a question mid-workflow, he needs the answer as quickly as possible. When the expert with that answer is in another building, or even another country, time can be lost in going to find the morphing to catch them near the phone.



## The Digital Worker Ecosystem



Using a combination of cameras and supervision and communication applications, Sogeti can empower dispersed teams to work together as one. Remote assistance solutions enable experts and managers to share pictures, documents, and even use live-stream video and AR/VR capabilities to demonstrate complex tasks to colleagues any where in the world. With these advanced collaboration capabilities, they can:

- **Provide remote assistance** for field workers from back-office experts
- **Secure complex and/or non-recurring procedures** in-situ
- Improve **operational traceability** enhanced with media content
- Improve **guidance and geo location** for field workers
- Provide **training** to newcomers or support **ongoing learning and skill improvement** by displaying workflows and procedures in-situ

### Technology Building Blocks

The Digital Worker is a flexible offering, made up of a number of technology components that can be deployed and combined as needed to create the bespoke solution to best suit your business. Some of the core components include:

- **Personal Gateway:** This gateway connects the field worker to their work environment and the network.

Sensors positioned on the worker, and those measuring ambient data such as pressure, temperature and geo-location, pass the data they collect to the personal Gateway card. Personal gateway is powered by elements of the Intel® IoT Platform, which are optimized for low power high utilization IoT use cases

- **Middleware Connect:** The heart of the system device connects to sensors and Personal and device gateways to centralize all available data and connect it to existing systems and applications. The 'master' Middleware connect device can be supplemented by additional 'extender' devices to help scale the Digital Worker solution across multiple sites
- **RAaS:** This remote-assistance platform module underpins multiple maintenance, testing, training and remote support usage models.

The solution also leverages strategic investments that Capgemini and Sogeti has made in AR and VR. In addition to providing solutions running on tablets and smartphones, we work closely with Intel and other ecosystem players to ensure all hardware and software elements of the Digital Worker solution are available to support virtual networks that will power tomorrow's manufacturing industry. New features now available include "freehand" Digital Worker solutions.



Capgemini and Sogeti are ready to help you jump start the implementation of digital manufacturing strategies for lasting competitive advantage. Get started with a workshop or a meeting today!

Learn more about the **Digital Worker Solution** from

<https://www.capgemini.com/service/digital-services/digital-manufacturing/>

## About Capgemini and Sogeti

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With more than 190,000 people, Capgemini is present in over 40 countries and celebrates its 50<sup>th</sup> Anniversary year in 2017. A global leader in consulting, technology and outsourcing services, the Group reported 2016 global revenues of EUR 12.5 billion. Together with its clients, Capgemini creates and delivers business, technology and digital solutions that fit their needs, enabling them to achieve innovation and competitiveness. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Sogeti is a leading provider of technology and software testing, specializing in Application, Infrastructure and Engineering Services. Sogeti offers cutting-edge solutions around Testing, Business Intelligence & Analytics, Mobile, Cloud and Cyber Security. Sogeti brings together more than 25,000 professionals in 15 countries and has a strong local presence in over 100 locations in Europe, USA and India. Sogeti is a wholly-owned subsidiary of Cap Gemini S.A., listed on the Paris Stock Exchange.

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