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# THE ADDED VALUE OF DIGITAL OPERATOR SUPPORT ON THE SHOP FLOOR

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*Production of smaller series and customised products brings a higher level of production complexity with it that requires changes not only to the production process, but also to the way operators work. To support operators in their rapidly changing and expanding range of tasks, a variety of digital tools are available today, each with its own characteristics and possible applications.*

"The Ford Model T is available in any colour, as long as it's black". Everyone knows this famous quote by Henry Ford. Henry Ford was one of the founders of the assembly line at the time, with a focus on mass production. Through a thorough analysis of production (based on Taylor's principles), he succeeded in producing cars in large numbers in an efficient manner. Operators were trained to do their own very specific task in the most efficient way.

The contrast with production today could not be greater. In recent years, the manufacturing industry has clearly evolved from mass production to the production of smaller series of customer-specific products (we all want something unique). In addition, customers have lost their patience and they all want their products delivered as quickly as possible at the best possible price. This shift has resulted in increased complexity in production. And this can be felt on all fronts: planning and control, production logistics and the production processes themselves.

This shift isn't self-evident for production operators. Whereas in the past one had to make (virtually) the same product over a longer period of time, nowadays one has to switch continuously between products. Managing this complexity is a huge challenge. Fortunately, a tsunami of new technologies has broken through in recent years (under the umbrella of Industry 4.0). A number of these technologies focus on supporting the operators.

While cobots, industrial robots and mobile robots are mainly used to take over certain (physical) tasks from the operator, there are also a large number of digital tools that can be used to cognitively 'unburden' the operator. The idea behind these technologies and applications is simple: the right information at the right time in the right place. In this summary article, we zoom in on a number of interesting technologies and applications. Given that this market is constantly evolving, new applications are added at regular intervals.

## **DIGITAL OPERATOR SUPPORT, A NUMBER OF ADVANTAGES**

In mass production, it is usually sufficient for the operator to thoroughly go through the 'production manual' (e.g. technical file, CAD files, assembly instructions) (coupled with a practical training/induction period) in order to be able to work. When producing smaller series of customer-specific products, extra attention must be paid to ensure that the product is assembled according

to the specific customer requirements. Reading through a traditional (often paper) production manual quickly reaches its limits (and mistakes are quickly made when one is less attentive). In addition, each product requires specific instructions. This is where digital tools can provide a solution. There are a number of clear advantages to digital support for your operators:

- **Up-to-date information:** The operator always has access to the most recent information (changes to instructions can even be made last-minute, without disrupting production).
- **Personalised information:** by scanning, for example, both the order and the operator, personalised instructions can be provided (taking into account the level of the operator).
- **Diversified information:** it is possible to provide information in different forms (e.g. pictures, animations, videos, etc.)
- **Interactive information:** interaction can be provided, such as the opportunity for feedback, checking off checklists, etc.
- **Linked information:** there's a direct link to the ERP/MES system, so critical information can be logged (e.g. whether or not to carry out an important quality check) or times recorded (measuring production times).
- **Mobile information:** the information can be provided via various media (e.g. smartglass, tablet, screen, AR/VR headset), which allows for mobile (and remote) working.

It should come as no surprise that digital operator support is increasingly finding its way onto the production floor. We would like to share some inspiring applications with you in a subsequent blog post.

## DIGITAL WORK INSTRUCTIONS

One of the best known applications for digital operator support is digital work instructions. They are typically used for tasks where errors or forgetfulness are difficult to exclude, such as complex assembly operations, jobs with critical operation sequences, operations where the setting parameters of tools have to be correct or when specific safety or quality operations must be followed. They also offer clear added value in remote applications (e.g. maintenance).

Digital work instructions can be created relatively easily (e.g. via the CAD files of the product, or via drag & drop, etc.) and are relatively easy to maintain via adjustments on the basis of product changes. Digital work instructions can be offered via various media. The most common are classic computer screens, tablets, smartglasses and via projection. Some well-known examples are [Proceedix](#), [Azumuta](#), [Manual.to](#), [Swipeguide](#), [Gemsotec](#), [Arkite](#) and [Light Guide Systems](#).



## AR/RV-INSTRUCTIONS

Another technology that often pops up when it comes to digital operator support is augmented reality and virtual reality. Without going into too much detail about the technology itself and the differences between them, with AR the users can still see the real world (the real environment is enriched with additional information, such as holograms), while with VR the user is completely in a virtual world.



AR/VR applications are most commonly used for operator training. In the literature we find several advantages: an increased commitment of the participants, less training budget needed, the possibility to train several employees simultaneously, a reduction of risks and safety problems during training, the possibility to test/experiment more intensively, etc. This can lead to a 50 per cent improvement in both the speed and quality of training. According to Edgar Dale's learning pyramid, after two weeks the human brain would have remembered 10 per cent of what it reads, 20

per cent of what it hears, but 90 per cent of what it does or simulates.



In addition to technical training, AR/VR is often used for 'procedural training', such as fire safety, first aid, and so on.



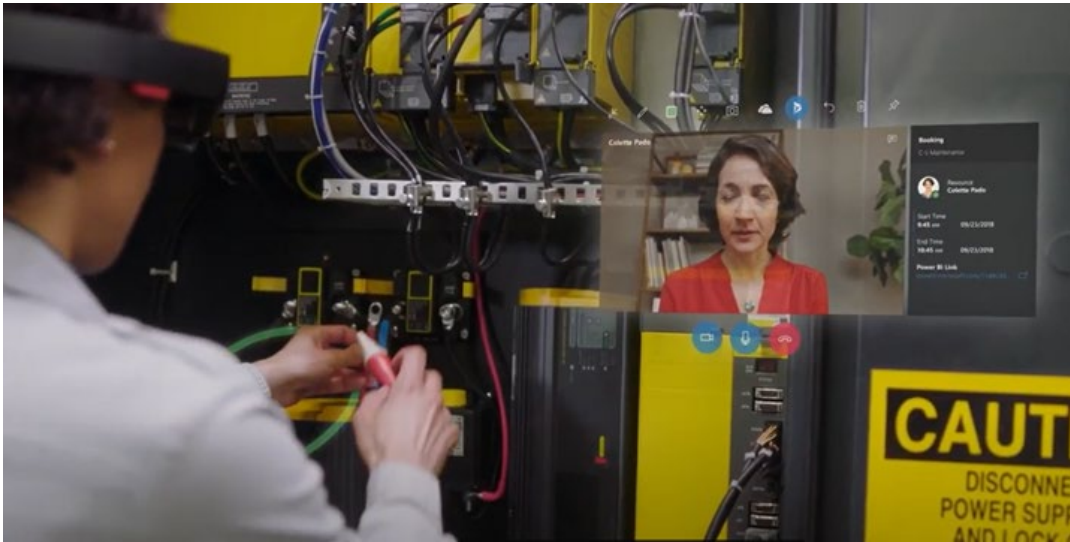
You can find some inspiring examples via the following links: <https://playitsafe.eu/sector/>, <https://www.mobietrain.com/>, <https://www.rhinox.be/>, <https://onebonsai.com/>, <https://but.digital/be-en/>, ...

## REMOTE OPERATOR SUPPORT

A final area of application is the remote support of operators. The increased complexity in production naturally extends to other departments, such as after-sales and maintenance. Indeed, service technicians are also confronted with a greater variety of machines and installations. Here too, digital tools can provide the right information in the right place at the right time. This allows for the purpose of 1) increasing productivity in the field, 2) increasing the first-time-fix rate (the problem is adequately solved), 3) shortening the lead time for maintenance/technical interventions and 4) increasing training-on-the-job, compared to classical technical training. The use of wearables



(e.g. smartglass) allows the service technician to have his hands free to do the job properly.



Furthermore, recent systems have integrated feedback functionalities (e.g. the service technician logs certain problems or checks crucial checkpoints) and support functionalities (e.g. the technician calls for support from an engineer).

## OPERATOR SUPPORT TESTING PLATFORM

Digital work instructions support your operators in performing their work efficiently. Sirris has a specific testing platform around this theme: using the [Operator support testing ground](#) we want to demonstrate technologies and applications and stimulate companies through generic demonstrators that are available to the companies. This with the support of VLAIO in the context of Industry 4.0.

## CONTACT

### BART VERLINDEN

PROGRAM MANAGER SMART & DIGITAL FACTORY

[bart.verlinden@sirris.be](mailto:bart.verlinden@sirris.be)

+32 498 91 93 07

### CHRISTOPHE MICHIELS

SENIOR ENGINEER SMART & DIGITAL FACTORY

[christophe.michiels@sirris.be](mailto:christophe.michiels@sirris.be)

+32 478 43 99 64