



**How 3 digital technologies have
successfully enabled several OEM
and car manufacturers to eliminate
human errors and increase
production quality**

3 Reasons why automotive manufacturing operations became so complex

From mass production to personalized production

The pace of market change has been accelerating for years now. Driven by increased global economy, heightening customer expectations and faster product obsolescence. Additionally, alternative offerings and new technologies are gaining traction: electrical vehicles to hydrogen-fueled fleets to shared mobility.

In fact, car manufacturing is no longer simply about making a car with 4 wheels. Consumers demand for highly personalized products, tailored to their unique preferences. Consequently, auto manufacturers need to offer a greater variety of options in lower volumes. Meaning that manufactures must manage a wide product portfolio and an expanded list of parts and components all with different suppliers, lead times,... Needless to say that the result is an explosion of different processes and higher quality standards all adding to the overall production complexity.

Growing labour shortage

Labor shortages affect different industries but is causing great challenges in automotive too. Manufacturers are struggling to keep their plants staffed and are getting penalized when missing production deadlines. More worrying, labor shortages can even result in downed production lines and revenue loss. On top, operator groups are aging which means there is a growing skill gap between the younger and more experienced operators. Tough reality, manufacturers will need to capitalize on their exiting resources, and seek new ways to keep up the pace of growing consumer requirements.

Growing complexity = growing mistakes?

Mistakes are an inherent part of any process entering from various sources, but most common and unpredictable errors originate from humans. Human errors count for a huge part of all unplanned downtime. Factors such as skill gap, memory, alertness and fatigue all play a role. At the same time, there is obviously an intensified competition for consumer attention, resulting in more complex products and production processes.

Need a little help?

In a volatile and uncertain business context, it's mission critical for manufactures to improve agility and resilience of operations.

Fortunately, digital technologies can support in overcoming some of the challenges and help manufactures to reduce avoidable errors, increase operations performance and production quality.

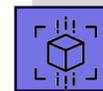
In this white paper, you will get to learn the benefits of 3 innovative - but proven - digital technologies adopted by various OEM and car manufacturing leaders.



Digital Work Instructions



Machine Vision



Augmented Reality

Digital Work Instructions



1th step



Digital instructions provide operators with in-context information on a monitor and guide them through each step of the production chain.



Up-to-date instructions

Paper-based instructions can easily get lost require revision and become obsolete. With digital-based instructions, you always have the latest and up-to-date version at hand.



Comprehensive instructions

Wrong understanding of instructions can have serious consequences. Digital work instructions are a proven productivity builder. Using images, video's, symbols, drawings, complex procedures are communicated in a more comprehensive way. Typically, these are built by more experienced workers to capture tribal knowledge leading to operator mindfulness and limits stress for younger, unexperienced operators.



Process optimization at your fingertips

Digital work instructions are part of a continuous improvement approach. It becomes very simple to identify the relevance of each step and to suggest and submit changes. Following lean principle, it supports in empowering operators and translate their feedback into instant process changes.



Central instructions library

A central repository of all instructions allows to scale up to different workstations or sites enforcing consistent measurable standards at scale.



Operator skill level

User credential management bridges the skill gap between younger and aging operators. The process is tailored to the operator proficiency adding more (or less) detailed instructions depending on the skill level.



Traceability

Real-time data is collected to enhance traceability. All results are logged (time, torque,..) so everything you need to know about your operation is available to you: operator performance, torque results, step completion time, error rate,...

Machine Vision



2nd step



A vision system with built-in AI capabilities can track and validate operator handlings, inspect products (shape, color, irregularities) and verify product position.



Monitor operators and eliminate human errors

Despite having good intentions, some mistakes are almost inevitable, but the results can be disastrous. With vision, the accuracy of operations is drastically improved as manual actions are monitored by computer algorithms.



Reveal the invisible

Not everything can be seen with the naked eye. Vision can help bringing this kind of information to the surface with good/no good assessment.



Detect errors at the source rather than downstream.

The further a bad part makes it down the assembly stream, the more value it costs to be removed. Vision can detect errors at source and prevent flaws in base materials or malfunctions in components.



Handle unlimited number of variants

A vision system can easily identify the right variant component product, which occurs to be extremely powerful when components look very similar, making sure the right parts have been picked and assembled.



Flexible manufacturing

Unlike classic 3D sensor technology, vision systems can overcome imprecise part position and automatically adjusts when parts have been shifted.



Automate annoying, repetitive tasks for the operator.

Eliminate operator variance and fatigue from the equation by automating more dangerous, repetitive tasks so the operator can concentrate on more value-added work.

Augmented Reality



3rd step

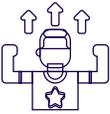


Projection-based Augmented Reality (AR) presents digital information in the physical world. It projects a virtual operating layer onto any work surface and guides operators through work.



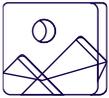
Ultimate immersive experience

In combination with vision, it's the ultimate process guidance for zero defects manufacturing. Operators just need to "follow the lights", and as a result work faster and smarter.



Ease training-on-the-job

Rather than pulling operators into artificial classrooms, manufacturers can organize training right on the shopfloor. The benefits are huge: learner confidence is increased, new processes are successfully executed, operators need less supervision and training time is drastically reduced.



Visual learning

People are visual learners. Visuals are universal and tell more than a thousand words. On top, visual information sticks better as graphics draw the attention. Thanks to AR complex tasks become more comprehensive and accessible to anyone.



Establish better and more prompt interaction level.

Operators get better equipped to respond to challenging situations. Corrective actions are visually presented in front of the operator.



Performs hands-free

In many cases having both hands available is required. Once the operator has executed a task in the correct manner, the processes continuous automatically. There is no need to consult information away of place of work, which is just prone to error.



Providing a distraction free environment

People are easily distracted and of course it's hard to stay focused 24/7. As there is no need to consult information elsewhere, operators keep human eyeballs on the job.



Would like to follow in the
footsteps of...



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