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Knowledge Transfer in Mechanical Engineering: From Static Operating Manuals to Interactive 3D Training and Service Instructions

The new Machinery Regulation 2027 makes it increasingly clear that traditional documentation is reaching its limits. Static operating manuals only partially meet the requirements of modern manufacturing companies. What is needed are precise, visually guided step-by-step instructions that make knowledge easy to understand and accessible at any time.

Efficient knowledge transfer not only accelerates machine commissioning, training, and maintenance. For globally operating machine manufacturers with customers, multiple languages, and international service teams, consistent and easily accessible knowledge transfer is becoming increasingly important. It is therefore becoming a key competitive advantage in the international market.

The Challenge

Machine manufacturers face a central question:

How can customer-specific documentation and training materials be created efficiently, consistently, and at scale?

Traditional approaches quickly reach their limits:

- Photos have to be recreated for every machine configuration.
- Renderings require significant effort and often provide limited comprehensibility.
- Videos require a physically available machine in the exact customer configuration.
- Changes to the design often result in extensive revisions of the entire documentation.

In addition, documentation and training departments can usually only begin their work once the design has been completed – often far too late in the project lifecycle.

Digital 3D instructions help machine manufacturers meet these requirements efficiently. Instead of providing information exclusively in static documents, safety-relevant work steps, maintenance processes, and operating procedures can be visualized directly on the virtual machine model. This gives users clear, easy-to-understand, and context-specific information exactly where it is needed.

The Solution: Interactive 3D Instructions with vSTAGE

Our customers use vSTAGE to create interactive 3D training, service instructions, and digital knowledge libraries in a very short time based on up-to-date CAD data.

Documentation, training, and service teams can create content independently – without programming skills and without prior experience in 3D animation.

Within just a few hours, employees are able to create interactive training courses and service instructions. And they can do so long before the physical machine is available on the shop floor.

The Creation Process

Whether based on existing documentation or entirely new processes, content can be created quickly and efficiently.

Existing PDF documentation or content from documentation systems can be analyzed and structured using AI and transformed into interactive step-by-step instructions.

Once the process has been defined, it is linked to a CAD assembly. vSTAGE then automatically creates a new training project:

- Work steps and texts are prepared.
- The interactive 3D model is available for every step.
- Existing images, videos, and documentation content are incorporated.

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With just a few clicks, animated visualization steps can be created in the integrated 3D editor. The result is a fully visualized instruction in which a freely rotatable and zoomable 3D model takes center stage.

This makes even complex technical processes easy to understand and communicate precisely.

The Update Process

Changes to design are part of everyday life.

In traditional documentation processes, this often means that large parts of the visualizations have to be recreated.

With vSTAGE, the effort remains minimal. When the linked CAD model is updated, existing visualizations are automatically updated and synchronized. This can reduce the effort required for documentation updates by up to 90%.

Adapting to Other Machine Configurations

Operating, maintenance, and service instructions must match the respective customer machine exactly.

Traditionally, this often means starting the documentation process almost from scratch.

With vSTAGE, existing training content and manuals can be transferred to new machine variants. The software compares the assemblies of both configurations and automatically transfers identical components.

The result:

- Reuse of existing content
- Significantly reduced creation times
- Consistent documentation across all customer projects

Differences can then be adapted specifically instead of having to recreate the entire instruction.

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Publishing and Using the Content

Once created, the interactive 3D knowledge library can be made available through various channels.

The content can be integrated directly into existing:

- Learning Management Systems (LMS)
- Customer portals
- Service platforms
- HMI solutions

The instructions can also be used offline or provided directly at the machine. Operators therefore have visual support available at any time for:

- Tool changes
- Maintenance work
- Troubleshooting
- Servicing and repair processes

Interactive 3D content also provides significant value in classroom training – whether on tablets, integrated into your PowerPoint presentations, or even directly in vSTAGE as a virtual reality training experience.

The Benefits at a Glance

With the intelligent workflows of vSTAGE, machine manufacturers can efficiently create and maintain a large number of high-quality interactive 3D instructions.

The key benefits:

✓ Significantly faster knowledge transfer during technical onboarding

✓ Significantly less effort for translations and documentation updates

✓ Up to 90% less effort for documentation updates

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✓ Higher service quality through precise instructions in the field

✓ Fewer operating errors during maintenance and servicing

✓ Faster response times when faults occur

✓ New digital service offerings with direct customer benefits

In addition to a first-class machine, your customers receive a scalable digital knowledge platform that supports the entire lifecycle of the equipment.

Would you like to learn how you can preserve critical know-how for the long term and accelerate knowledge transfer sustainably?

We would be happy to show you how machine manufacturers can create interactive 3D training and service instructions with vSTAGE in a very short time.

Find out more about the additional benefits of interactive 3D content in technical training in our next blog post.

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