Quanos

AI@Quanos: Your Key to a Data Treasure Trove

How Artificial Intelligence From Quanos Improves Documentation, Aftersales, and Service

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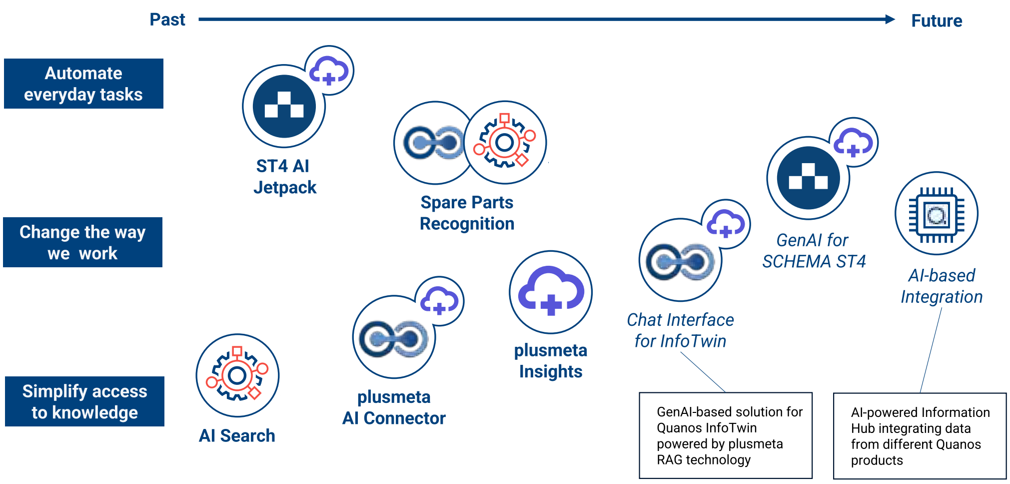
AI@Quanos: Navigating the future with electric bikes, steam engines, and treasure chests

At Quanos, we have an answer for those asking how companies in the machine and plant construction sector can become **more efficient, sustainable, and cost-efficient** while putting their **ever-expanding volumes of data to more effective use**: artificial intelligence.

Motivated by our **passion for smart information**, our daily mission is to find even better ways of processing and connecting information. **Artificial intelligence supports us in this ambition**. As the leading provider of software solutions for aftersales, service, and technical documentation, we see AI as an opportunity to interconnect data in a way that makes components, systems, and machines more understandable for people.

Our experience with smart information combined with plusmeta's outstanding expertise in the field of AI is thus reflected across our **entire product portfolio. All of our Quanos software solutions put the power of AI within our customers' reach.**



We see AI as a **catalyst for digitalization** in the mechanical engineering sector – and as electric bikes, steam engines, and treasure chests. This white paper looks at what this entails and how aftersales, service, and technical documentation professionals can already reap the benefits of AI today.

From a dream of intelligent machines to AI assistants for machine manufacturers

Scientists were already looking for ways to create virtual replicas of biological brain functions and teach computers how to learn back in the early 20th century. Fast forward around 100 years and two industrial revolutions later, and AI is now ubiquitous. **This includes at Quanos**, where we are integrating principles such as machine learning, data mining, and artificial intelligence as well as more advanced forms of generative AI (see glossary) into our products and services.

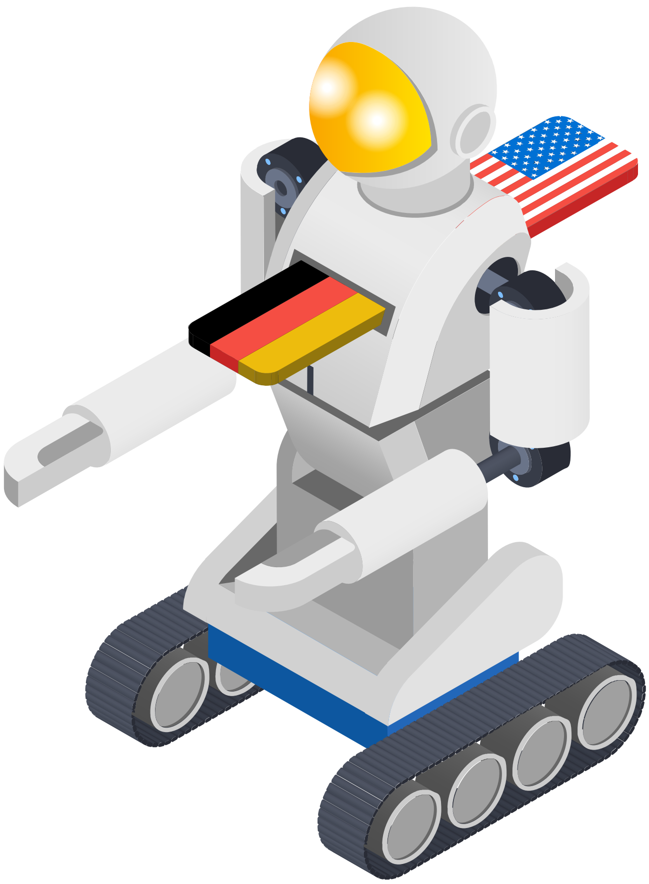
AI@Quanos: approaches for service and content optimizations

Artificial intelligence made the biggest leap in its evolution so far in 2022 when OpenAI introduced ChatGPT as a type of **generative AI**, or neural network that is trained using big data to autonomously generate text, images, and language. Because the training data is text-based, ChatGPT is considered a **large language model** (LLM) – a language-capable AI that serves as an interface between humans and the algorithm.

Here at Quanos, we are also creating interfaces between humans and machines and increasingly relying on AI to help us to do so. One simple example is the 3D models of machine components or entire product ranges that are often used in machine and plant construction. Creating virtual photos from the models makes it possible to use them as training data for **visual spare parts recognition**, an image recognition AI solution currently in development at Quanos. Based on a photo of a defective part, the AI can then identify the right spare within a matter of seconds.

But the experts at Quanos were looking into the possibilities offered by artificial intelligence long before all the hype around ChatGPT, so we already have a broad spectrum of practical applications at the ready to help our customers in the mechanical engineering sector to accelerate their digital transformation.

We call this approach AI@Quanos and see it as a mix of methods including everything from chatbots to LLMs. However, the main aspect is which types of AI or combinations thereof will deliver the greatest benefits over the long term in terms of the challenges faced by machine manufacturers.



When we think about AI, we see potential: three forward-looking applications

The more powerful a tool is, the better you need to understand it in order to use it effectively. What is our basic understanding of AI and its uses here at Quanos? Jan Oevermann, founder of plusmeta and an AI expert, primarily thinks of this in terms of electric bikes, steam engines, and treasure chests.

AI as an electric bike: support for existing processes

An electric bike is emblematic of technologies that support processes rather than fundamentally changing them. If you switch from a conventional bike to a bike with an electric motor, you're still riding the bike – just at higher speeds and over greater distances.

„One really important aspect is that the electric bike evens out performance within teams. If you're stronger you don't need as much assistance, and if you have less stamina you fall back on that support more. Ultimately, everyone is able to ride together at the same pace. AI solutions should have this same goal."

Jan Oevermann,
AI-Expert

When we think about AI, this means that:

- The AI **supports existing processes** by automating certain parts of them and relieving humans of tedious tasks.
- The support primarily runs in the **background** and doesn't change the process in its entirety.
- **Users with less technical knowledge** can also use the process with the support of the AI.

AI@Quanos: AI Search for Quanos SIS.one

Quanos SIS.one, our spare parts catalog system, is a leading solution for the management of spare parts and service information. Those using SIS.one can already put the **AI Search** feature to use to automatically search for spare parts and suitable content in documents.

Human in the loop – people are indispensable

Whether you're riding an electric bike or navigating an AI environment, traveling at higher speeds increases the risk of an accident. Automating errors is one of the risks that comes with using AI for support, so it makes much more sense to keep humans in the loop as a controlling entity rather than fully automating processes.

Our processes at Quanos don't run on a completely autonomous basis; the operator plays an integral role. Transparent parameters, source documents, and locations where content was found allow people to not only keep tabs on and understand the results of the AI, for example, but also their database.

AI@Quanos: plusmeta Insights

Plusmeta Insights is an intelligent chat assistant that interacts with technical content. Based on content, metadata, and a knowledge graph – a semantic data model that contextualizes information and its interrelations in visual form – the assistant backs up its answers with context and semantics so they can be verified.

For example, the assistant indicates which parameters it extracts from the prompt in order to find answers. If the answer seems very unusual, service technicians and technical writers can use the search parameters as a means of seeing where the AI misunderstood them and make further adjustments.

AI as a steam engine: disruption for better processes

The steam engine designed by James Watt sparked the Industrial Revolution and completely changed the way people worked and lived. Jobs disappeared, changed, or took on new forms.

Yet the steam engine wasn't a standalone technology; what really made it successful was how it was used. It powered other machines in factories and became mobile in the form of the steam locomotive. While the steam engine did increase productivity and prosperity, it came with high investment costs and consumed a great deal of energy, leading to it ultimately being replaced by new technologies.

How AI powers modern processes

Like the steam engine, AI isn't a standalone technology but encompasses **numerous different processes**. We are seeing an AI-induced disruption in the field of translation, which also plays a role in technical writing.

- Rather than translating texts manually, many translators now make use of AI-supported translation tools and edit their output.
- But AI hasn't made language skills superfluous. Translators still need to check the original text during the review process so they can see whether the translation conveys the same meaning.
- That being said, translators now work much more intensively with the target language than they once did. The process has changed significantly and is picking up speed, powered by the AI steam engine.

AI@Quanos: ST4 AI Jetpack

With SCHEMA ST4, Quanos offers a component content management system that lets teams create technical documentation with ease and efficiency. The system now includes **ST4 AI Jetpack**, a cloud-based AI solution that assigns taxonomies and metadata for ST4 nodes on an automated basis. Looking to the future, it will also be possible to use **generative AI** to automate, reshape, and reformulate content, or modify it for specific target groups.

A service pioneer. By inventing the steam engine, James Watt laid the foundation not only for our modern world but also for the pay-per-use business model. Factory owners were reluctant to make such a large investment, so Watt initially charged by the piston stroke rather than selling his steam engines.

The AI treasure chest: gleaning new information from existing data

Reaching into a treasure chest is always rewarding. You'll be surprised at what you find and can also acquire new things with the resources inside. This is a metaphor for applications such as **visual spare parts recognition**, which makes it possible to use available resources for new applications and access them via AI.

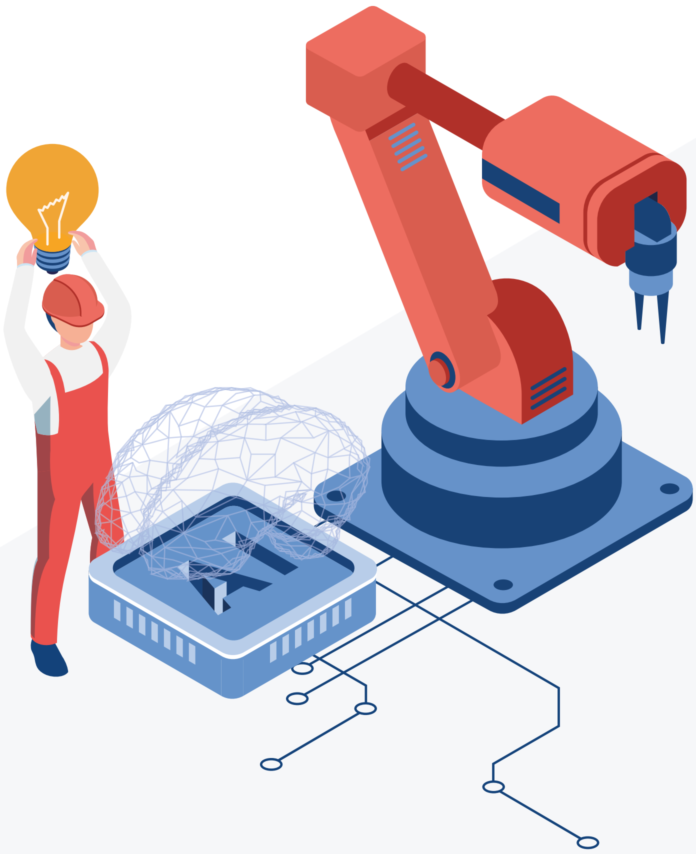
Service AI that thinks for itself

An example from the field of **technical documentation** demonstrates how AI technologies use existing data to leverage valuable efficiency gains. Manuals play an important role in this area and are very profitable treasure chests, as their content is pure gold for technicians. But mountains of documentation have so far been much like the treasures of Atlantis: mythically alluring and completely unlocatable.

AI doesn't just point the way to the data treasure trove, it already knows which jewel of information the technician needs for their specific challenge. Rather than hunting through a manual the size of an encyclopedia to find the information they need, the technician simply leaves this task to the AI.

- A service employee asks the AI a specific question about a maintenance step they need to carry out.
- The AI analyzes suitable information within the technical documentation and links this to the information available from other relevant sources.
- In response to the service employee's questions, the AI formulates detailed, meaningful answers while backing up the information with the locations where it was found. As a result, the person who asked the question can immediately carry out further research in the documents and check the answer.

This AI-based chat assistant provides valuable support at a time when we are facing a shortage of skilled workers: more and more experienced service technicians are retiring, while new employees need to gain initial experience. Quanos is already working to implement an **intelligent copilot** of this type for the InfoTwin, which technicians can use as a means of support to "talk" to technical content and gain new insights.

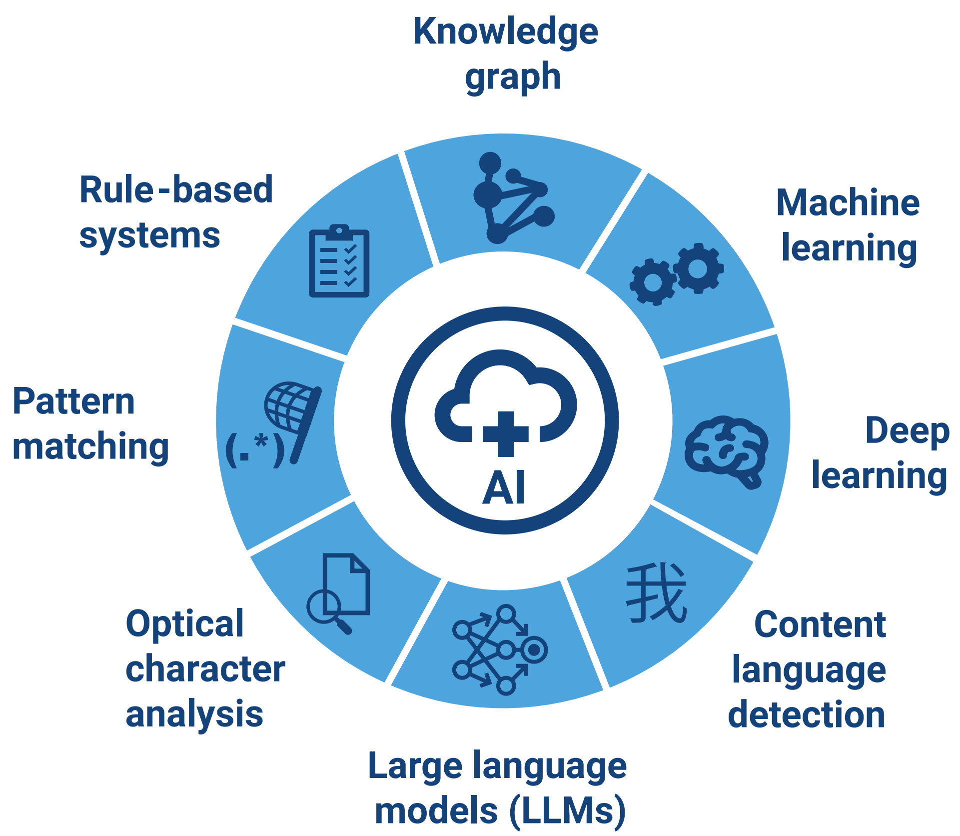


AI@Quanos: plusmeta Platform

One solution that is already available is the **plusmeta platform**. Many projects start with the task of getting the available data into a condition where it can be put to best use. This also includes integrating data, instructions, and documents from suppliers into a company's own database.

AI@Quanos is the key that unlocks the data treasure chest by giving companies the option of using the cloud-based AI platform rather than manually assigning metadata to supplier data. This platform automates information processes and helps companies digitalize their technical documents. One way it does this is by importing unstructured sets of data consisting of many different PDFs and analyzing them.

Based on the identified content, metadata are then assigned to the PDFs and they are categorized and structured. Quanos InfoTwin users who have the **plusmeta AI Connector** can also make use of these functions directly in the digital twins of their service and spare parts information.



How Quanos guarantees security, quality, and transparency when using AI

Quanos develops software solutions and AI applications for service and technical writing teams. This means that we integrate artificial intelligence into an environment that involves processing **sensitive data and documents of legal relevance**. Given these conditions, our software developers and IT specialists make sure that the AI is integrated in a secure way and delivers accurate, high-quality results:

- **Security:** An AI needs training data in order to continually improve, and some of this data is of a sensitive nature. We make sure that training data is stored in Germany and transferred via encrypted connections.
- **Data quality:** "Garbage in, garbage out" is often said when a software solution outputs poor results due to low-quality input data. Training data determines the quality of answers in the AI environment as well. Structured data with complete and correct metadata is ideal when it comes to setting up assistance systems – and Quanos has already been using the necessary processes and technologies for years.
- **Transparency:** The processes running inside an AI's "head" are complex. The more advanced the AI model, the more difficult it is for humans to check the algorithms it uses to perform tasks. We want to keep the results transparent, so our AI applications at Quanos provide the search parameters, sources, and the locations of content on which their answers are based.

Conclusion: Whether it's an electric bike, steam engine, or treasure chest, AI@Quanos delivers the impact your company needs

Machine and plant manufacturers are currently facing significant challenges. **Cost pressure** continues to be the main obstacle to growth for 82 percent of decision makers, followed closely by the **shortage of skilled workers**. In this difficult environment, there is a technology that offers hope: 52 percent of companies in the mechanical engineering sector are confident that artificial intelligence will **permanently change** their industry and can boost their **efficiency and competitiveness**.

But even though AI offers vast potential, 53 percent of industrial companies would prefer to wait and see what experiences other companies have in using AI first.

"Those who wait won't be able to play a leading role," said Bitkom President Dr. Ralf Wintergerst at the 2024 Hannover Messe. We don't want to lose any time.

If you don't want to lose time either, you need an experienced partner like Quanos that can offer you technological expertise and an in-depth understanding of specific AI applications and the AI needs of machine manufacturers.

We use our AI expertise and ability to understand data to support your AI transformation. Whether it's an electric bike, steam engine, or treasure chest, we help you find the AI solution for your challenges that will make the biggest impact and offer maximum benefits for all users.

Key AI terms at a glance

- **Artificial intelligence (AI)** is a subfield of computer science. The aim of AI is to create computer systems that replicate certain functions of the human brain.
- Like the brain, AI models are based on **neural networks**. An AI is trained by feeding its neural network with classified data, a process known as **machine learning**. When a neural network consists of multiple layers with different tasks, this is called **deep learning**.
- **Data Mining** refers to the ability of AI to search through vast volumes of unstructured data – or data lakes – for patterns that provide users with a basis for decision-making.
- **Generative AI** is capable of using learned information to generate new content.
- **Large Language Models (LLM)** are computational models capable of language generation that are trained on huge volumes of text data.

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