REVOLUTIONIZING ENGINEERING WITH INTELLIGENT INFORMATION

How Empolis Intelligent Views' content delivery portal supports market leader Bosch Rexroth with the implementation of ctrlX AUTOMATION.

EMPOLIS
INFORMATION MANAGEMENT

With over 32,300 employees in more than 80 countries, Bosch Rexroth AG is a globally leading supplier of drive and control technologies in the market segments of Mobile Applications, Machinery Applications and Engineering, and Factory Automation.

"Technical product information was difficult to find," as Berthold Strucken remembers, Engineering Project-Office and Infrastructure, Translation and Product Documentation, Bosch Rexroth AG.

In 2020, Bosch Rexroth launched ctrlX AUTOMATION, a revolutionary automation platform that offers an open ecosystem and surmounts the classic boundaries between machine control systems, IT, and the Internet of Things. The scalable platform enables the flexible design of centralized and decentralized automation topologies. With a real-time Linux operating system, open standards, app programming technology, web-based engineering, and comprehensive IoT interfacing, ctrlX AUTOMATION reduces engineering efforts by 30 to 50%, thereby reducing the time-to-market for new machines. Users can deploy Bosch Rexroth apps, as well as third-party apps or apps developed in-house. The multiplier allows third-party suppliers to expand their business models and the reach of their solutions.

The Challenge

Platform users need fast access to required information at any time. Bosch Rexroth previously provided monolithic contents in the form of PDFs for this purpose. However, this method became inadequate because it did not meet user expectations for finding and retrieving relevant information. Intuitive search input and navigation frequently did not produce the anticipated results because of abstract category definitions and redundancies.

For ctrlX AUTOMATION, this form of information retrieval was no longer fit for purpose. What users were now mainly looking for was improved searchability and faster retrieval of relevant content, as customer feedback showed:

- *"If I don't know what the name of the product is, then I can't find it."*
- *"You have to search for ages to find the right information."*
- *"There's a 600 page catalog and you find the information on page 317."*

The Goals

- Web-based provision of information
- Simple and intuitive navigation, as well as filtering options
- Fast search for technical information
- Modular information objects rather than monolithic documents
- Information structuring and knowledge modeling

The Solution

Faster access to information through a content delivery portal

With i-views content, Empolis Intelligent Views offers a web-based, central content delivery portal (CDP) that addresses precisely these goals; aggregating and integrating all contents via common metadata – legacy data, contents from other systems and from marketing documentation.

Networking contents with the knowledge graph

Users' searches are always context-sensitive; they may want to find information on fitted components or in which application is it used. What is the user's role, who has the problem?

„As a **maintenance engineer**, I would like to identify the problem quickly when a warning arises (e.g. low battery voltage, buffer battery needs replacing). I need instructions fast for problem resolution. (replacing the battery)."

„As a **commissioning engineer**, I would like to reference a drive to establish a measurement reference for an absolute measurement system."

"As a **mechanic**, I would like to set up a safety zone. For this purpose, I need an overview of the necessary equipment, the wiring and the parameters needed for the safety zone."

To provide appropriate answers, technical information needs to be viewed from various perspectives and the insights gained must be combined. This is achieved, for example, through the networking of technical documentation data as well as product and user knowledge, which will allow relevant connections between the available information and the user queries to be analyzed and revealed: Which chapters are actually relevant for the particular user? What might be the next steps the user will take in this context and how can they be supported in their efforts? When a technician checks whether a component is functioning, at which point should testing be performed as well?

From these examples alone, it is clear that results from a pure full text search may not bring the query very far. To establish this networking, the CDP uses the integrated knowledge graph technology from Empolis Intelligent Views. The semantic technology provided with knowledge graph enables comprehensive representation of a subject or knowledge area and its logic. This makes it possible to find answers to complex questions, underpinned by comprehensible reasoning. Knowledge graphs make human knowledge "machine-readable" and allow it to be represented digitally, thereby establishing content-based links between topics.

Finding information directly instead of having to search

Knowing that some required information can be found in a user manual or a repair manual does not really offer any added value to the user: it would mean having to search through both documents. Instead, the topic-oriented approach places the focus on the document context and on the actual information that is contained within a chapter. Consequently, the user is led directly to the relevant chapter with the desired information.

i-views Content supplies users with information in a context-relevant manner appropriate to both the application and user. Besides modular information from content management systems, various other information sources can be included as well. The CDP creates the right prerequisites for documentation to become part of the digital value chain. Technical documentation turns into a digital information resource that users or service employees can view and search through on mobile devices, on the machine's screen, or on the company PC. You also have the option of saving individual chapters as PDFs, collating them in a collection in a flexible manner, and subsequently making them available to your colleagues.

The metadata, which enable filtering and improved retrieval in the CDP, can, for instance, include product versions, attributes, and components, as well as target groups and applications.

There is no need to define the metadata from scratch each time because they can simply be copied from external systems such as your PIM or ERP in the process of synchronization. Company-specific and iiRDS metadata (Intelligent Information Request and Delivery Standard) are also supported and can be harmonized if required.

The Implementation

Challenges and Approach

Two significant challenges regarding the implementation of the product information portal had to be faced. Close cooperation with the Bosch Rexroth editors proved to be a major success factor in facing the challenges.

One crucial point was the provision of the so-called P&D data (parameter and diagnostic data) in the CDP.

This data includes technical documentation content that provides problem diagnostics for specific products and scenarios. These are intended to help users resolve the particular issue and provide guidance in troubleshooting. The challenge in providing the P&D information lay in the fact that readable content was not yet available for this purpose. The pieces of information that were available were located in two different systems. Thanks to effective integration, users can now receive valuable P&D content that they can put to use.

This is where the CDP's flexibility and functionalities become real assets, enabling the information from different systems to be aggregated and harmonized.

Some of the required information is created in the content management system. This involves parameterized topics with the P&D descriptions.

But it is through the aggregation with data from a separate Access database that the relevant pieces of information, such as software, hardware, and release, actually come into play.

For Bosch Rexroth, it was very important that this data aggregation does not deliver defined results, but remains flexible and dynamic. Thanks to detailed documentation of content creation in the CDP backend, authorized employees can perform modifications themselves and make additions to content, layout and structure.

Cooperation with Partners

For the creation and implementation of a new metadata model, Bosch Rexroth decided to collaborate with long-time partner Thomas Katzenmeier from Ingenieurbüro Katzenmeier in Mainz and in favor of the delivery standard iiRDS.

"It was especially important to define the use cases in the Rexroth product world and model them in the semantic knowledge network. This allows us to integrate them with other systems and platforms and create other use case scenarios."

Thomas Katzenmeier, Engineering Office Katzenmeier

Uniform metadata with the iiRDS standard

The iiRDS standard defines a consistent vocabulary for technical documentation metadata and a package format for the delivery of contents including metadata. The vocabulary describes metadata used to enrich technical documentation and converts it into intelligent information, as well as the connections between the different metadata. The package format enables exchange of information across devices, regardless of manufacturer or system.

Access from other Rexroth applications and presales activities

Another important aspect for the implementation of the information portal was accessibility from other Rexroth applications. With the CDP, providing this access is straightforward and does not require elaborate interfacing.

Excellent results were achieved very quickly; i.e. it has become possible to access the information portal and context-specific contents directly from system control units and from the online help system.

It is possible to merge "worlds" with each other. Different departments in a company often use different content management systems.

i-views Content is able to handle the different formats, convert them into iiRDS, and thus allow them to be connected and networked to grow the company's overall knowledge base.

"Now we have the "Amazon-feeling!""

"Our users no longer have to search around in manuals and look through hundreds of pages, but find the required information immediately. The expense has been worthwhile!"

Berthold Strucken, Engineering Project-Office and Infrastructure, Translation and Product Documentation, Bosch Rexroth AG.

Success

The system has been well received by the Bosch Rexroth employees. There have already been numerous requests from other departments (other product groups as well as Service) to be allowed to place their documents in *i-views Content* and make them available to users.
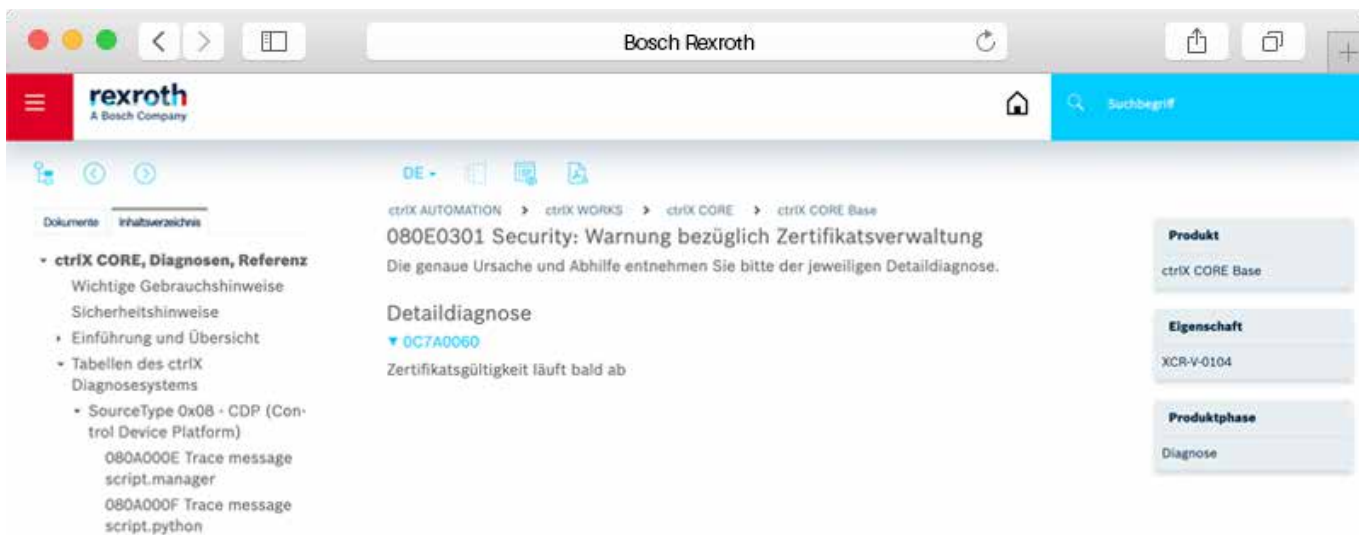
About Bosch Rexroth

As one of the world's leading suppliers of drive and control technologies, Bosch Rexroth ensures efficient, powerful and safe movement in machines and systems of any size. The company bundles global application experience in the market segments of Mobile Applications, Machinery Applications and Engineering, and Factory Automation. With its intelligent components, customized system solutions and services, Bosch Rexroth is creating the necessary environment for fully connected applications. Bosch Rexroth offers its customers hydraulics, electric drive and control technology, gear technology and linear motion and assembly technology, including software and interfaces to the Internet of Things. With locations in over 80 countries, roughly 31,000 associates generated sales revenue of roughly 6.2 billion euros ($7.3 billion) in 2019.

About Ingenieurbüro Katzenmeier

Ingenieurbüro Katzenmeier is a service company for technical communication. The company designs and creates technical documentation and supports customers from different industries in the development and construction of intelligent information systems. His particular strength is the combination of sound technical know-how with many years of experience in technical communication.

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Empolis provides solutions that enable companies and organizations to analyze, interpret and automatically process the rapidly growing amount of structured and unstructured data. They utilize their knowledge capital to improve enterprise-critical business processes enabling decision-makers, employees and customers to reliably receive precise and relevant information, situation-appropriate and task-relevant, for faster and better decisions.