BUSINESS WHITEPAPER

Knowledge Management for Service

With intelligent solutions, your employees can resolve problems more quickly and have the latest service documents at their fingertips at all times. The result is more efficient customer service and a measurable reduction in processing and repair times.

Contents

CHAPTER 1

Management Summary

Technical service is becoming increasingly important in the manufacturing sector as an operation with its own strategic focus and a rising share of revenue. The shortage of skilled labor and demographic change are the largest challenges facing those responsible for providing this service – especially in the context of digitization and the trends of "Industry 4.0."

Service managers and team leaders are under a great deal of pressure to take appropriate steps to optimize efficiency and service quality and meet the increased expectations of customers. At the same time, the measures commonly adopted, such as continuous optimization of processes and training, can only partially mitigate the impending shortage of skilled labor.

With the help of intelligent software, service can be provided across multiple channels. The most important objectives here are as follows:

- Rapid and automated handling of simple and recurring customer inquiries
- A higher rate of first-contact resolution
- A reduction in the rate of escalations to the next support level
- Effective preparation of field-service assignments and prevention of repeat visits

To achieve these objectives, those in charge of service must introduce effective measures that support short-term successes and at the same time help attain strategic company goals. In the process, the following approaches should be considered:

1. Make service knowledge accessible at a central location
Needed information is often found in lengthy instructions and operating manuals. Customer service employees spend too much time looking for information. With the help of modern software, an internal company knowledge portal should be set up across all available data sources, greatly speeding up and simplifying the process of searching for the right information. Ideally, AI-based technologies will be used for this, in order to locate all of the relevant information in the context of the search query.

2. Introduce software-based diagnostic processes
Being able to handle customer inquiries more quickly is tied to resolving more cases at the first contact. Service workers in 1st- and 2nd-level support can use software-based diagnostic processes to resolve far

more issues right away and escalate fewer of the cases they handle. This has the positive effect of reducing the burden on higher support levels, which can then concentrate on resolving more complex cases.

3. Encourage the digitization of service knowledge
Putting service knowledge in digital form can result in a long-term reduction in the workload of individual experts and bring it to a more normal level. When all service workers learn from one another and share their knowledge, they can increasingly resolve similar cases on their own.

KEY TAKEAWAY

To counter the various risks of knowledge loss with effective strategies, managers should introduce an intelligent solution that covers several areas, such as the availability of information, system-based diagnostic processes and knowledge transfer. Because of the complexity of technical customer service and the high quality standards involved, knowledge management software like Empolis Service Express is an excellent choice.

In addition to all of the features mentioned above, the off-the-shelf software Empolis Service Express also offers other options, such as a mobile app for data access independent of the user's location, and integration to common CRM/ERP systems.

The software is designed specifically for technical service and is updated on a regular basis. Customers can therefore rely on extensions to existing functionality and a solution capable of performing well now and in the future. That is one of the reasons why more than 700,000 enterprise users worldwide work with Empolis software day in and day out. What's more, the software is incredibly flexible and adaptable with regard to performance and costs, which means that entry-level packages can be attractive for companies with as few as 20 service employees.

CHAPTER 2

Challenges in Service

Increasing importance of customer service

More and more, technical customer service is becoming a crucial factor for business success. In a world of nearly interchangeable products, it offers an important opportunity to set oneself apart from the competition. Moreover, services have a substantial effect on revenues and cash flow. However, when it comes to supplying service information with the necessary efficiency and quality, traditional service systems quickly reach their limits – especially in the case of complex customer inquiries.

So it isn't surprising that the primary cost driver in customer service has shifted. Whereas in the past, a large proportion of service costs resulted from routing and case tracking, approximately 80 percent of the costs of a support query now result from the process of gathering information about the context of the problem and identifying a solution. This changed proportion is a consequence of four key factors:

Impending loss of service knowledge

As a result of the acute shortage of skilled labor and the departure of experienced employees, companies risk losing a great deal of their accumulated stock of knowledge, especially in service. According to the Federal Statistical Office of Germany, about 2,500 workers in Germany will enter retirement every day from 2020 onward, and the working population will shrink more rapidly than ever before in the coming years. This will lead to a deficit of 352,000 workers in just one year. That would equate to the combined workforces of the two giant corporations Daimler and Deutsche Post.

Shorter innovation cycles

The complexity of equipment and systems is constantly increasing, while innovation cycles are becoming shorter. This is leading to an almost exponential increase in the number of product variants for which a company has to offer service.

As the configurability of systems grows, so too do the requirements for the documentation of customer-specific systems, which are reinforcing the trend toward tailor-made products as standard. Complying with regulatory provisions also requires corresponding measures with regard to documentation, and legacy systems are often not adequate to the tasks involved.

New products with IT services

In the course of technical progress, physical products are increasingly being combined with IT services, which is making it more difficult to gather reliable information for identifying problems, with the result that purely technical expertise is no longer sufficient for troubleshooting. At the same time, the necessary training cannot be carried out adequately amidst a large volume of support queries.

From 2020 on, about 2,500 employees will retire every day

As systems and equipment become increasingly interconnected in the framework of "Industry 4.0" or "IoT," more and more data about status information and error messages must be processed and taken into account. Existing systems are coming up against their limits here too. But the use of new systems creates new data silos that make handling cases more laborious and time-consuming.

Distributed know-how

The service knowledge at companies is often stored in a variety of file formats in data silos that have evolved over time, and it usually isn't formulated with uniform, consistent terminology. As a result, information is difficult to access, and new employees can hardly find it. Even carefully planned information systems can soon be undermined when businesses enter into partnerships, there are takeovers, or additional systems are integrated.

Alongside technical hurdles, globalization brings with it a need for worldwide yet localized access to information – but the specialists with solid expertise are present at only a few locations. Despite a willingness to travel, the associated costs, the elaborate planning and preparation needed, and the amount of time required are out of all proportion to the incoming service orders. Providing service at the international level is also made more difficult by language barriers and time zone differences.
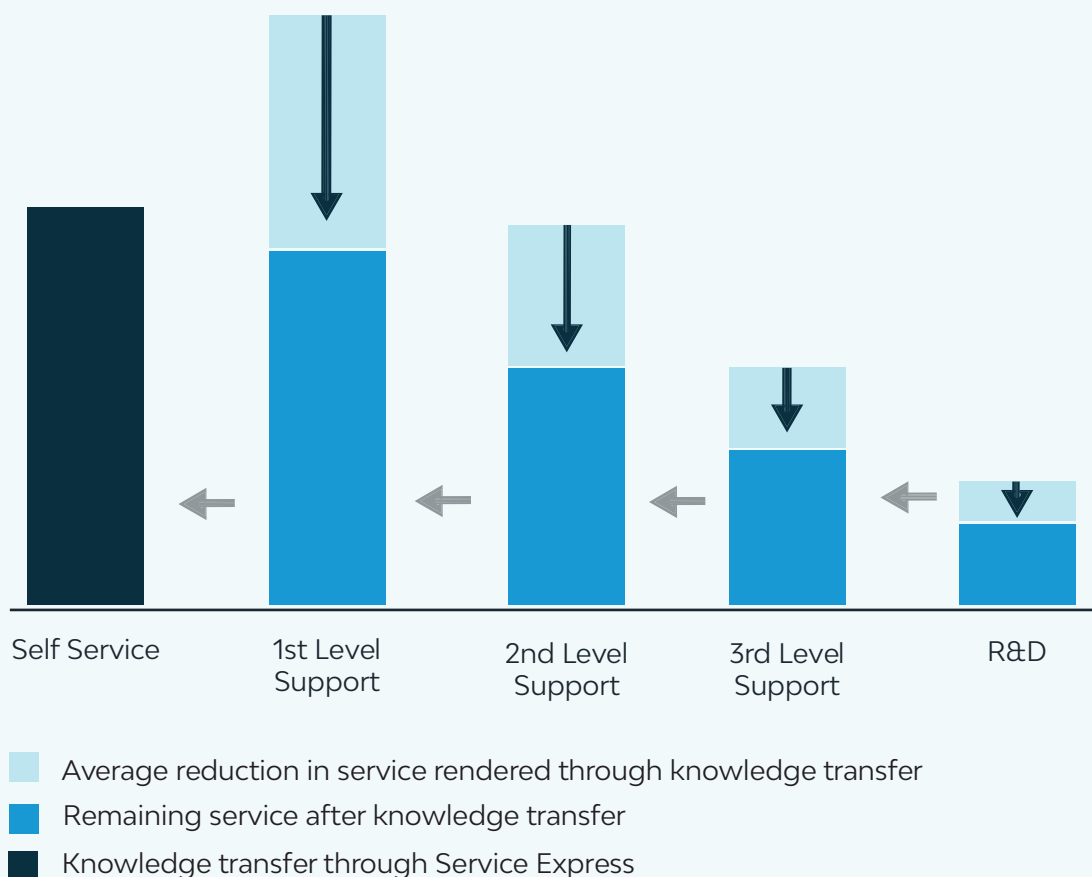
Service as a selling point

In a market setting with a high level of competition and interchangeable products, customer service is an important instrument for increasing customer loyalty and succeeding over the long term.

It also plays a role in certain new, disruptive business models in which the manufacturer takes over the operation of the products and systems that are sold and generates revenue by charging customers based on usage.

Through features like self-service portals, these operator models offer customers key added value while allowing manufacturers to generate new revenues. They represent a major opportunity for the suppliers – but to a great extent, the services needed for this are based on digitized service knowledge which is often not available in this form, resulting in the failure of such projects.

Service is shifted through knowledge transfer

Self Service · 1st Level Support · 2nd Level Support · 3rd Level Support · R&D

■ Average reduction in service rendered through knowledge transfer
■ Remaining service after knowledge transfer
■ Knowledge transfer through Service Express

Long-term reduction in the rate of escalations

Before
without knowledge transfer

36%

64%

After
with knowledge transfer

20%

80%
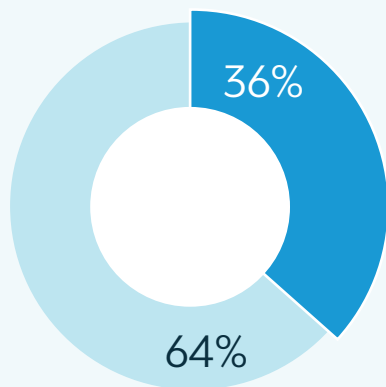
■ Escalation to next higher support level

■ Direct solution

The need for intelligent solutions

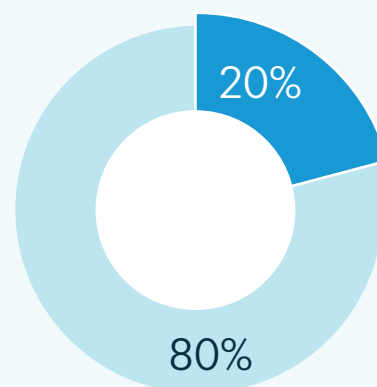The many different challenges that service managers are now confronted with illustrate the urgency and importance of solutions for modern knowledge management. It will be essential for companies to equip their customer service with these systems and continue to upgrade them. If they do not, they will no longer be able to meet basic customer needs in the future and will no longer be competitive.

At the same time, the impending generational change is resulting in the loss of valuable expertise, and this can only be counteracted through the digitization of service knowledge. Furthermore, knowledge management systems are the only way to handle the increasing complexity and sheer mass of data involved, so that the needed information can be usefully structured and supplied in the form required.

Empolis Service Express was developed specifically in order to deal with these challenges in technical service through innovative and intelligent technologies. Its cloud-based system enables fast and direct access to the required information and permits reliable and documented diagnostics in the service process. Since quality-controlled service

knowledge is supplied systematically to users with various levels of training, the first-time fix rate can be increased by up to 55 percent.

With Empolis Service Express, service workers in 1st- and 2nd-level support can take over more cases from 3rd-level support and resolve them independently, since they can rely on the digitized expert knowledge.

This helps to remedy the disparity in typical service structures between high numbers of users and small numbers of experts, because service cases can be distributed more evenly, reducing the workload for individual experts. At the same time, this allows companies to achieve long-term improvements in strategic KPIs.

Solution Overview
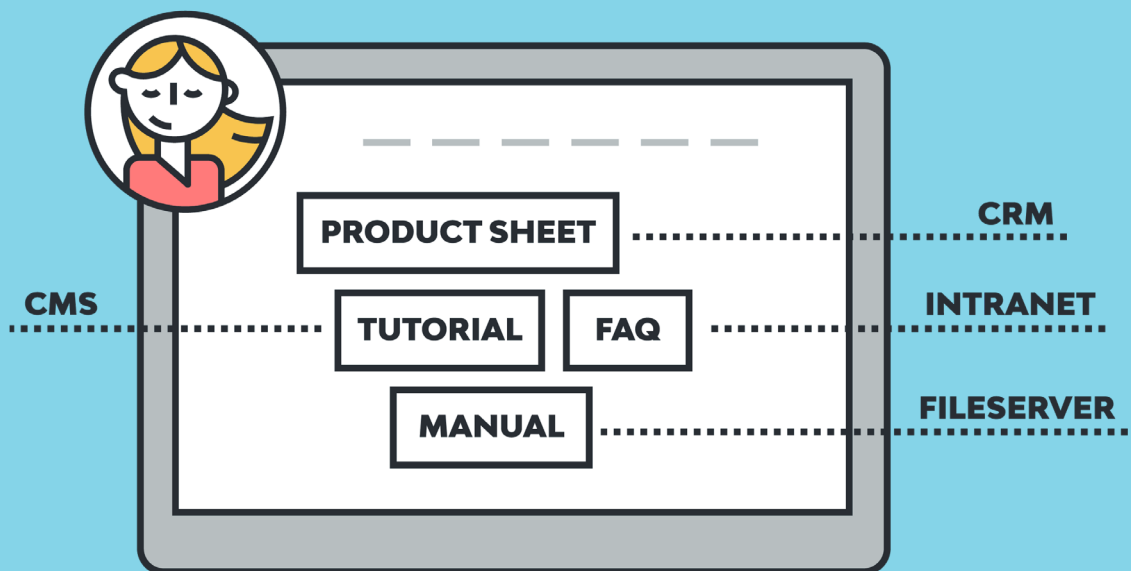
Many different functions

Empolis Service Express supports service employees in the field and in the office by quickly supplying all the relevant context-specific information. Empolis Service Express generates a consistent view of the information, even when the data available for troubleshooting is heterogeneous and the processes involved are of average to high complexity. The system accomplishes this through a variety of different functional modules that can be used by service workers in 1st-level support, on-site engineers, experts or customers themselves.
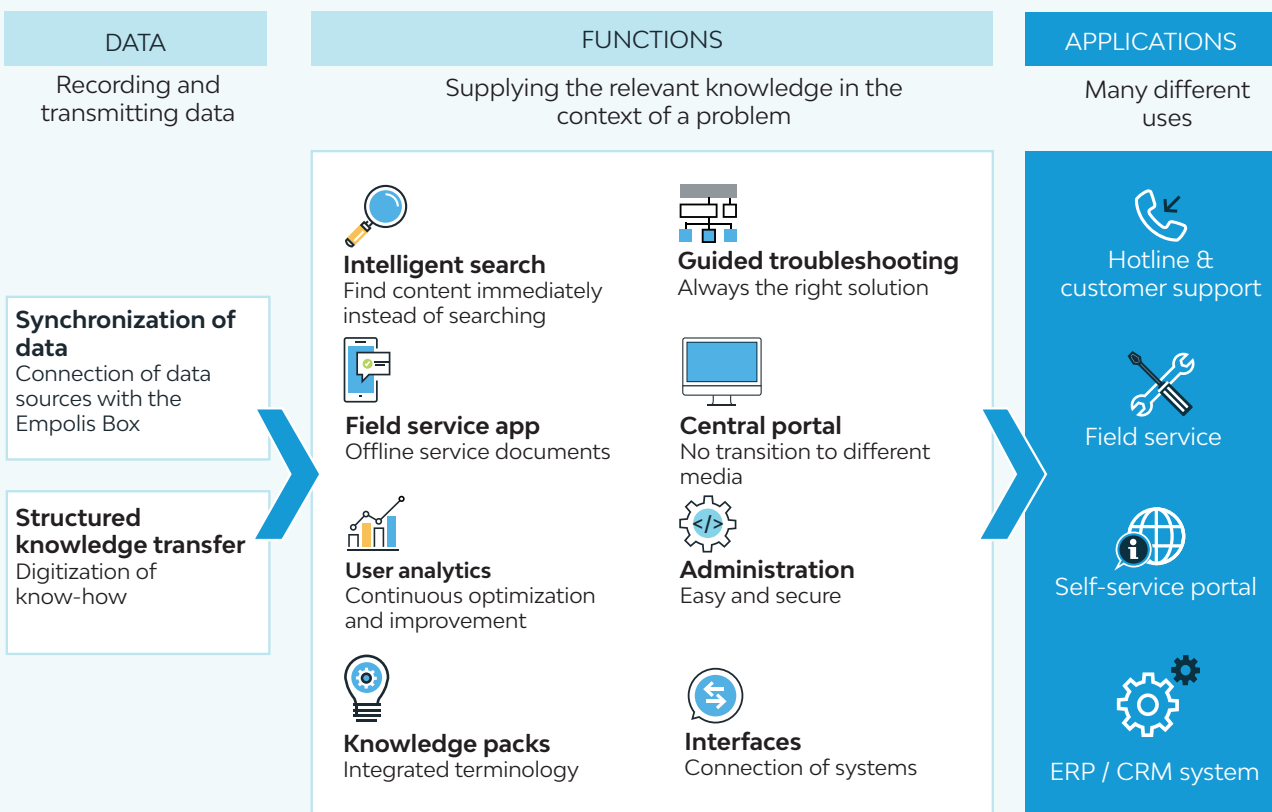
Maximum benefit thanks to AI

Users access all relevant information through an AI-based, natural-language search feature that presents neatly arranged results sorted by relevance. The system employs self-learning techniques and adapts to the needs of the user. Less-experienced employees are simply guided to the right solution, one step at a time.

Experts, on the other hand, can engage in more complex research, switching seamlessly among the information objects in order to determine the appropriate solution by either evaluating the existing data or narrowing down the issue using the tools and visualization options available.
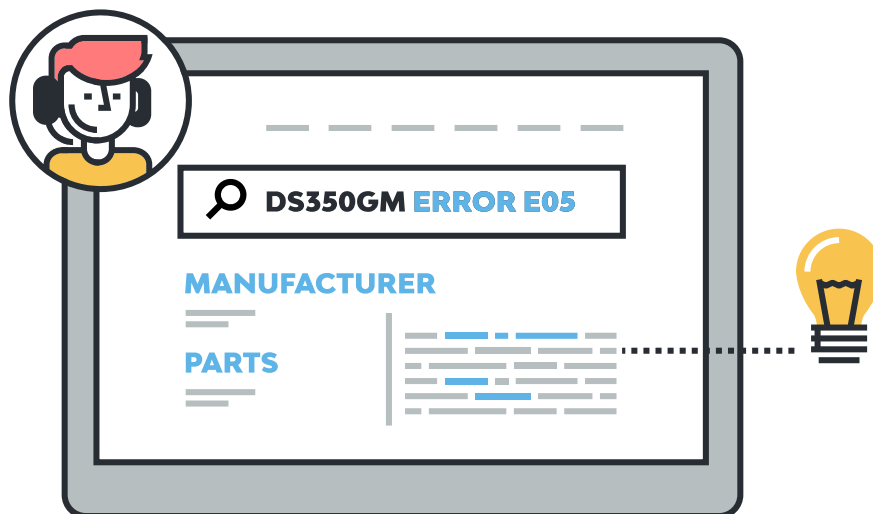
Continuous improvement

Empolis Service Express continues to improve with use. To that end, the software logs and evaluates all interactions. This makes it possible to identify knowledge gaps, such as when information is lacking with regard to certain problems. Based on the reports generated by common business intelligence tools, users can find out which queries have been made most often, and the subjects for which more information is required during a certain period of time.

Comprehensive functionality of Service Express

DATA	FUNCTIONS	APPLICATIONS
Recording and transmitting data	Supplying the relevant knowledge in the context of a problem	Many different uses

Synchronization of data
Connection of data sources with the Empolis Box

Structured knowledge transfer
Digitization of know-how

Intelligent search
Find content immediately instead of searching

Field service app
Offline service documents

User analytics
Continuous optimization and improvement

Knowledge packs
Integrated terminology

Guided troubleshooting
Always the right solution

Central portal
No transition to different media

Administration
Easy and secure

Interfaces
Connection of systems

Hotline & customer support

Field service

Self-service portal

ERP / CRM system

Intelligent search

Central access to all information

With the intuitive, intelligent troubleshooting, service employees obtain access to all the relevant information. The natural-language search query can be narrowed down through navigation and additional filters. The two techniques can also be combined.

The intelligent text-mining engine takes into account both semantic and linguistic information, including word stems and synonyms. The right answers and solutions, according to context, can therefore be provided to a large variety of users from self-service portals, help desks or field service teams. One key benefit is the access to data stored in external file systems, databases and ticketing or document-management systems, so that the same data never has to be maintained or saved in multiple places.

Access can be controlled for each user through a system of rights and permissions. For example, 2nd-level support can access information that hasn't been subject to quality assurance measures and is not shown for customers or partners in 1st-level support. Typically, this involves documents such as service reports, documentation, manuals, repair guides for hardware and software, FAQs or solution

specifications. Depending on the requirements, content can be processed according to certain criteria before being presented to users, such as when only selected chapters or pages from voluminous documentation are required, or when the contents need to be prepared for display on a mobile device.

WHAT YOU STAND TO GAIN

Increase in first-call fix rate

Empolis Service Express transfers the needed knowledge to various support levels. It can increase the first-call fix rate, because the service specialist has all of the relevant information for troubleshooting and repair at the very first call or visit.

In addition to increasing customer satisfaction, this also reduces the service costs from expensive escalations and repeat visits.

Guided troubleshooting

Step by step to the right solution

The guided troubleshooting uses step-by-step instructions to enable the help desk and 1st-level service staff to respond from within their comfort zone at all times and always provide the same level of service. All incidents are dealt with consistently and systematically, while taking into account the context of the query or the customer.

In parallel with the diagnostic process, additional information is gathered to systematically narrow down the causes of whatever problems are involved. Data from third-party systems or information from the initial problem query is also taken into account.

To ensure a high level of service quality at all times, less experienced users can be required to follow a quality-controlled diagnostic process. If the need arises, experienced users can display all the known solutions even before fully answering all the questions in a step-by-step procedure in order to identify the correct solution right away.

Guided troubleshooting procedures are created, maintained, and managed using a web-based editing environment that requires no programing skills. This tool is intuitive in its operation, and all its features are available to the user without any system discontinuity.

WHAT YOU STAND TO GAIN

Increasing and standardizing service quality

With Empolis Service Express, you ensure that all of your employees always follow a quality-assured path to the right solution. This allows you to raise service quality and consistently provide customer service to a high standard.

Without any additional training, 1st-level support can then work through more cases or quickly put together all the key information for efficient resource scheduling. In this way, you offer your customers expert support during the first contact and increase customer satisfaction over the long term.

Field service app

Mobile data access for your field service – offline too

With the mobile Field Service App of Empolis Service Express, field service workers always have the latest documents at their fingertips on their tablet or smartphone.

The app is intuitive in its design and can be used by service workers straightaway without any training. After logging on with their user data, they have immediate access to all the relevant service information. With the search and filter feature, the required information can also be located with ease from the field – by entering the search term in the conventional way, or through a QR code or voice input.

By means of a favorites feature and the synchronization of frequently used documents, all of the functions can be used in offline mode too, so that service technicians in the field are no longer dependent on cell phone reception.

The distribution of new or updated information is performed by Empolis Service Express automatically, and right on the mobile devices of service engineers. Information is encrypted in transit and supplied in accordance with access permissions, with only authorized users being granted access to sensitive data.

WHAT YOU STAND TO GAIN

Reduction in costs per visit

With Empolis Service Express, service engineers can solve the problem at hand during their first visit to the customer, because they're carrying the entirety of their company's service knowledge in their pocket.

That shortens repair times and prevents expensive repeat visits. Distributing service knowledge in this way also makes it easier to train new employees. At the same time, the automated distribution of information minimizes update cycles, making it possible to respond quickly to new requirements.
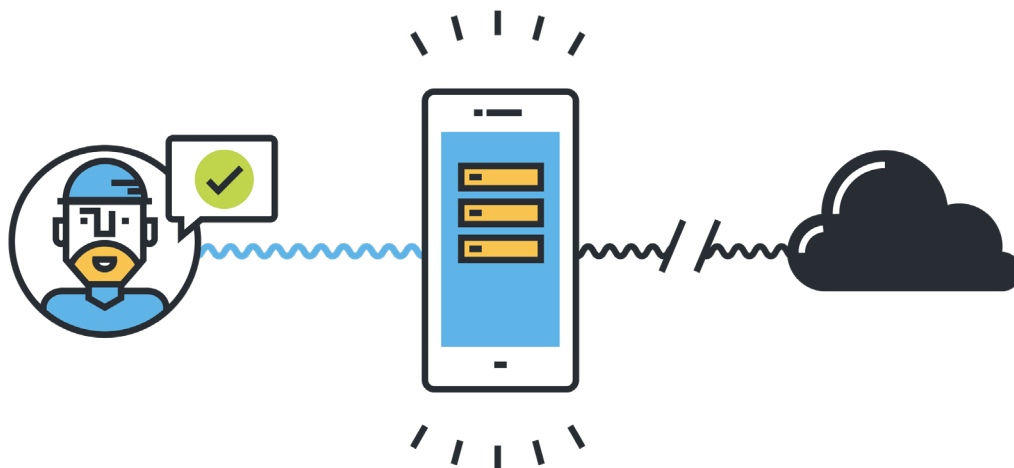
Structured knowledge transfer

Digitize knowledge with ease

Empolis Service Express provides you with all the important features needed to record service knowledge quickly and easily – regardless of the terminal device used. Predefined templates can be filled out by employees in a structured manner and then supplemented with images, videos or documents. A subsequent manual approval process for newly created content guarantees the correctness of the input and safeguards the quality of the data.

After the content is approved, there follows a centralized process of synchronization and indexing, and new service knowledge is then available for all employees in just a few minutes. During the input process, the system adds metadata to the content in order to display it at the right places in response to searches.
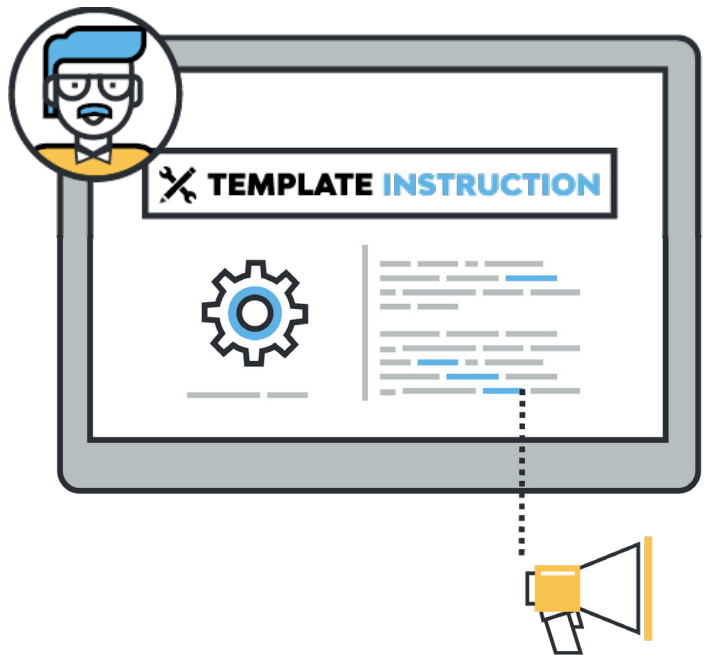
WHAT YOU STAND TO GAIN

Effectively preventing the loss of service knowledge

The effects of demographic change can be felt across all industries in the form of a shortage of skilled labor. New, inexperienced employees need an opportunity to familiarize themselves with existing service knowledge by means of appropriate documents.

With Empolis Service Express, you can digitize this knowledge quickly and easily – which gives you an effective tool for the transfer of know-how. Furthermore, preparing and sharing service knowledge ensures that your organization can continue to function and takes some of the burden off individual experts, since more employees can carry out specific activities. Release cycles for new documents are also shortened.
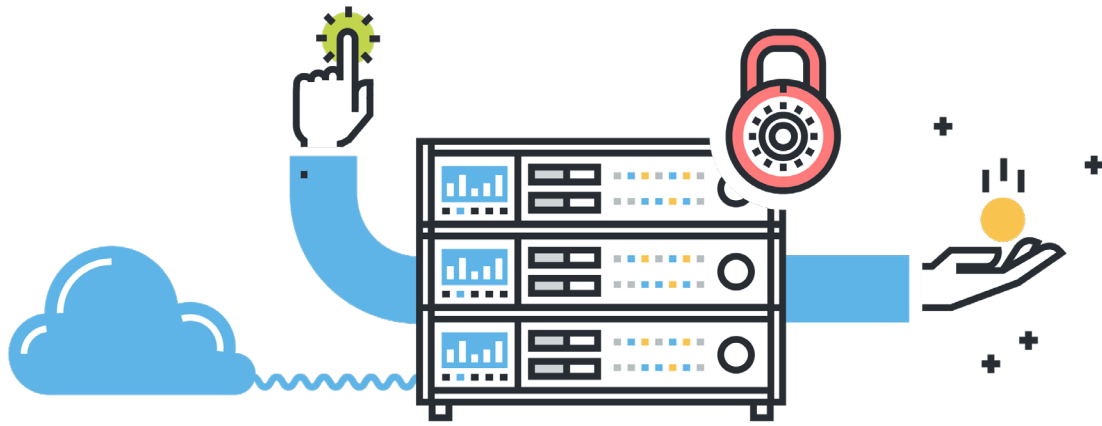
SOFTWARE-AS-A-SERVICE

All features at the click of a button

Empolis Service Express is available at the click of a button according to the software-as-a-service model and can be extended and scaled as desired to meet the functional requirements of the customer. Users can therefore access the application and its data from any location, around the clock, and with any device. This eliminates the high costs of buying, installing, maintaining and updating hardware and software. New versions and updates to Empolis Service Express are released regularly, so that users are always working with the latest version of the application.

The system is run in quality-controlled computer centers in the Frankfurt am Main region. The computer centers and services are certified in accordance with the standards ISO 27001, ISO 27017, ISO 27018 and the German Cloud Computing Compliance Controls Catalog (C5) of the German Federal Office for Information Security (BSI). The standard ISO 27001 defines the requirements for establishing, implementing, operating, monitoring, inspecting, maintaining and upgrading a documented management system for information security in the context of the totality of business risks of an organization. Ultimately, the standard thus ensures best practices for security processes that help protect information resources.

EMPOLIS BOX

Easy access to existing data

The Empolis Box provides open interfaces for the synchronization of arbitrary data sources with Empolis Service Express. Examples include folders on file servers, support-ticket data from databases, and system notifications from news feeds.

Generic connectors can be used to link up existing systems via common exchange formats and interfaces (e.g., Fileshare, RSS, JDBC). Intelligent delta indexing allows the Empolis Box to identify changes in data that has already been transmitted in order to guarantee efficient synchronization between Empolis Service Express and the system in use.

The Empolis Box allows the definition of rights and access restrictions so that users will only ever find the content they have the permission to view. This is crucial, particularly in order to allow simultaneous use of content in the contact center, 2nd-level support, intranet, self-service and field service.

Start today!

Get a first impression of Empolis Service Express in just a few minutes! With the free test account, you can find out how you too can quickly optimize your customer service.

service.express/test-now/

CHAPTER 4

Application Scenarios

Customer support & hotline

For companies that offer their customers, partners and end users a help hotline, Empolis Service Express offers sophisticated and effective support for the employees on the phone. Comprehensive support is provided for the entire process — from call acceptance through tips on how to communicate with the customer through actions to conclude the call and document the solution. The help desk personnel work within their comfort zone as they have all the relevant information available at all times.

Numerous innovative features further optimize cooperation between various departments, such as when it comes to storing information temporarily or escalating issues. The solution has been designed to make integration with third-party systems quite easy. For example, this can make it possible for the service specialist to interact with the customer while starting additional diagnostic processes or fetching extra status information. Depending on the customer's preferences, there are several options available for the concrete visualization.

Field service

Service engineers at the customer's premises need any and all relevant information and have no influence on whether they can work online or offline. Often, engineers may find it difficult to access and exploit information, because only specific devices, laptops, tablets, etc., can be used, or very detailed information is needed for diagnostic processes.

Empolis Service Express offers an outstanding solution in this respect, in that the service app can be used even without an Internet connection. Here too, the ease of linking up third-party systems makes it possible to integrate ERP systems to see to resource scheduling or check the spare parts catalog while handling a service order. At the same time, all the information from the field service can be fed back

into the system, in the form of service reports or feedback, in order to initiate further improvements and continually expand the system.

Self-service portal

One common application where Empolis Service Express comes into its own is self-service via a website. Through special permission structures, documents or paths within decision trees can be selectively published.

This enables customers (or external partners) to independently resolve as many issues as possible and ensures that only reliable and reproducible information is published. Such a platform also offers excellent opportunities to interact with customers, to record their issues and preferences, and to establish a customer dialog that goes far beyond the mere provision of information.

It is also easy to create intelligent assistants such as chatbots, link them with Empolis Service Express and integrate them into your website. Your customers are hereby given effective tools to help themselves and can resolve many queries by themselves. In this way, you also reduce the number of inquiries at the Support Center and can then concentrate on complex cases.

Selected Customer References

INNIO JENBACHER GMBH & CO. OH

INNIO is a leading supplier of technology for gas engines and energy systems, and of a digital platform and associated services in the field of power generation and gas compression. Through a large network of service providers, the company is represented in more than 100 countries and offers professional customer service throughout the entire service life of the more than 48,000 gas engines supplied to customers worldwide.

Effective help in technical support
Based on Empolis Service Express, the company introduced the "Service Expert System," which supports its service engineers and the technical support team by supplying decision trees and providing service documents for troubleshooting and service visits.

Easy integration of existing data
It was crucial here to ensure that it was possible to incorporate the existing database with the diagnostic trees that were already available. The system currently has 1,000 users, and growing.

> "
> Empolis had the best vision of the future – and we were on board.

Bruno Plattner
Lead Project Management Specialist
INNIO Jenbacher GmbH & Co. OH

HOMAG GMBH

By its own estimation, HOMAG Group is probably the world's leading manufacturer of machinery and systems for the wood and woodworking industries. There are 1,100 service technicians across the world and a 35-man team at the headquarters in Schopfloch working around the clock to keep the machines running.

Their most important resource is the knowledge base eSupport based on Empolis Service Express. This intelligent system gives technicians quick access to what is now 2.1 million documents about several thousand machines. eSupport has reduced the time needed for a service order by some ten percent on average – something that makes customers happier and reduces costs.

eSupport pays for itself quickly
By conservative estimates, this investment was recouped through the time saved by technicians alone after two years. It was important to use the unstructured data that was already available in the company – without having to spend years painstakingly building up databases.

New documents can now easily be archived on a drive. They are then automatically indexed and are searchable in eSupport a short time later.

This was the only way it was possible to increase the document count by two million files from the CRM and ticketing system, machine documentation and remote service in just one year.

Used reliably worldwide
In addition, the software allows users from more than 100 countries to respond to service requests themselves. eSupport is optimized to understand the users' vocabulary, which of course differs from the language of the service professionals. Empolis Service Express uses intelligent search technologies for this, such as root word analysis, synonym resolution and similarity searches in six languages.

" Our aim is to improve the quality of our service handling and, of course, reduce the time it takes. And we are making measurable progress with Service

Peter Stoll
Head of Service Knowledge Management
HOMAG GmbH

PHOENIX CONTACT GMBH & CO. KG

Phoenix Contact is a global market leader for components, systems and solutions in the field of electrical engineering, electronics and automation. A family-owned company, Phoenix Contact now employs approximately 14,500 persons worldwide and had a sales volume of 1.91 billion euros in 2015. The product range comprises components and system solutions for the supply of power, including wind and solar, and the construction of appliances, machines and switch cabinets.

Intelligent knowledge management

Phoenix Contact introduced a knowledge management system based on Empolis Service Express. This centralized system is used by 16,500 employees and customers in over 40 countries who can access it from anywhere at any time.

Central portal for end customers

It was important for Phoenix Contact to be able to share its service knowledge with its end customers in a self-service portal called "Knowledge Base." This allowed the company to keep its processes streamlined and avoid setting up anymore hotlines in support. It also meant that it could offer its customers new services and thereby lay the groundwork for opening new communications channels.

16,500 employees, 40 countries 1 portal

Powered by Service Express
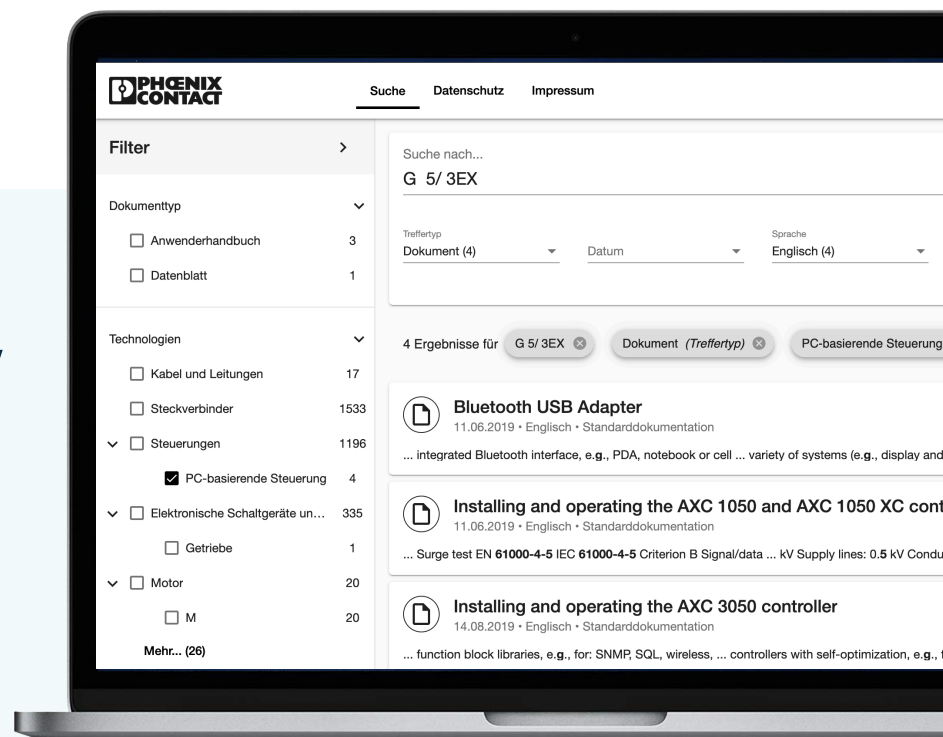
WEISS UMWELTTECHNIK GMBH

At Weiss Umwelttechnik GmbH, one of the most important manufacturers of machines for environmental simulations, stability assessment and emissions testing, the service department alone has 463 service staff and 29 hotline workers at 15 locations on 4 continents. These employees are engaged in preventive maintenance, servicing and calibration of the machines, in addition to ensuring a reliable supply of spare parts.

Up-to-date at all times

Based on Empolis Service Express, Weiss introduced the cloud solution "Cloud4Service" as a central, company-wide service portal. It supplies all the needed documents for troubleshooting and maintenance around the clock and guarantees that the latest software version is always installed and available for any given piece of equipment.

Access to data from any device

With Cloud4Service, every service employee has a central storage location for all documents, and he or she can access them around the clock on any device, whether it be a tablet or laptop, from anywhere in the world. This is a way for people to quickly help themselves. The documents are no longer scattered across multiple folders; they are available on a single platform with a modular structure. Cloud4Service now comprises 4,558 documents, in 7 languages, which are accessed by 419 users from 22 countries on 4 continents. With the portal, 10 service technicians save 30 minutes per day when performing troubleshooting tasks and searching for information: 10 hotline workers save 15 minutes per day when troubleshooting and answering routine questions; and 10 sales staff save 15 minutes per day when carrying out routine work. The result is savings of approximately 220,000 euros per year in the service field including the cost of advanced staff training.

"

> Getting the right information at the right moment every time is priceless. That sort of investment pays for itself immediately!

Marco Becker
Serviceteam Hotline Technical Support
Weiss Umwelttechnik GmbH

About Empolis

Empolis is the leading provider of smart information management software. Many notable national and international companies and public sector institutions rely on Empolis solutions, based on more than 25 years of industry and process experience.

Smart information management
Smart information management refers to the comprehensive creation, management, analysis, intelligent processing and provision of all relevant information needed for business processes, regardless of source, format, user, location or device.

Content created and managed in a component content management system is combined with the knowledge concerning products, customers, their profiles, suppliers, etc., that is stored in a knowledge management system or newly generated. The result is smart content that delivers added value.

Optimization of business-critical processes
Decision makers, experts, employees and customers are hereby supplied with precisely the knowledge that is relevant to their work, based on the situation and the task at hand.

What drives us:
The right information at the right time to the right person on the desired device.

The objective of all knowledge management and content management solutions is to optimize critical business processes, to facilitate sound decision-making in dynamic markets, to better understand current developments, to reliably recognize events and problems, and to react properly and promptly.

The quantities of data (volume) involved in these processes are increasing constantly, as are data complexity and diversity (variety), as well as the demands regarding processing speed (velocity).

Intelligent data processing
"Big data" — especially the exponential growth of unstructured data of the kind found in texts, business and PDF documents, web content, social media, video, audio, and graphics — confronts companies, managers, and executives with two particular challenges:

- The quality challenge: to deliver the required information with the greatest possible precision
- The quantity challenge: to process the greatest possible volume of information in real time

Data mining and traditional business intelligence systems have been processing structured data, such as that appearing in ERP systems and databases, for quite some time.

Smart Information Management plays a new, key role as a cross-system technology, allowing business applications to intelligently process information that comes from any source and occurs in a great variety of formats, some largely inaccessible before now. Its purpose is:

- to optimize business processes,
- within existing workflows,
- automatically and in real time, this significantly increases quality, productivity, and speed, making new business models possible.

CHAPTER 6

Appendix

List of Figures

Source

Statistisches Bundesamt - Demografischer Wandel (last retrieved on October 1, 2019)
https://www.destatis.de/DE/Themen/Querschnitt/Demografischer-Wandel/_inhalt.html