User Story

COSCOM User:	Berg & Co. GmbH (Bielefeld, Germany)
Date of Composition:	1 April 2026
Length of the Press Release:	1.600 words excluding company introduction, 10.819 characters including spaces

Central Data Platform Connects the Shop Floor and Increases Efficiency

Faster and more productive machining of workpieces while minimizing incidental expenses — BERG enables a seamlessly integrated flow of information from ERP to the shop floor with the COSCOM ECO-system.

An expert view of the shop floor reveals that the desire for end-to-end digitalization is often much greater there than in the office environment or development departments. This is hardly surprising, as the pursuit of end-to-end process design has a long tradition in manufacturing. It provides an answer to the shortage of skilled workers and helps counter cost pressures through increased efficiency.

BERG from Bielefeld, Germany, decided to introduce a **digital process network with a central COSCOM data platform in order to connect its previously isolated IT solutions in production into a powerful overall system**. All production information is now clearly presented via a single user interface. Data from various applications — including the ESPRIT Edge CAD/CAM system and the HAIMER tool presetting device — is consolidated and displayed at a glance in a task-oriented manner. Production data is visualized via COSCOM InfoPOINT terminals located directly next to the turning and milling machining centers.

Reliable, Innovative Pallet Clamping

BERG is known for its low-profile clamping heads and zero-point clamping systems. These systems act as an interface between the machine table and the pallet, making them particularly suitable for automated pallet changing. The aim of these designs is always to generate high holding force with minimal applied force.

The company specializes in the design and high-precision **manufacture of modular clamping systems for all standard interfaces used in gear and motor spindles**.
Another component of the product portfolio is rotary unions for transferring media such as cooling lubricants, air, or hydraulic oils. BERG's machine park includes a total of **18 turning and milling centers as well as grinding machines**, some of which operate in double shifts and are run by around 30 employees.

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A modern building complex houses approximately 5,000 m² of production space. The company is also particularly proud of its extremely low manufacturing tolerances of ±1 µm for four jointly manufactured zero-point clamping systems — a level of precision that is difficult to replicate.

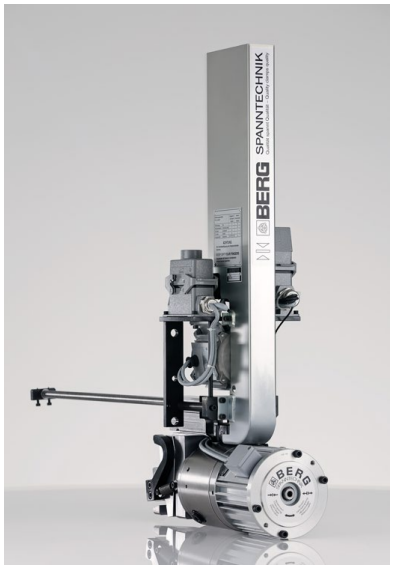

Image 1, 2: BERG designs and manufactures modular clamping systems for forming and machining machines that are used at a wide range of stationary and rotating interfaces. The entire machine tool industry sources its products from this flagship company.

At the Forefront – Also in Terms of Digitalization

The implementation of the COSCOM ECO-system represented a major step for BERG. The previously used DNC service from DLoG could no longer be installed after the transition to modern computer and IT structures. Support had also been discontinued after the supplier was acquired by a larger company.

The previously used tool management system also caused difficulties. A mandatory upgrade from the manufacturer would have been in the same price range as purchasing a completely new system.

“Experience forced us to look for alternatives. That’s when we came across the concept of satellite connections with a central platform and the modular solution offered by COSCOM in Ebersberg near Munich. We quickly realized how much this could move us forward. COSCOM’s promise of long-term support also confirmed that we had made exactly the right decision,” recalls **Oliver Oberkoch** (CAM programming / production planning).

Dirk Deppe adds:“We knew we were embarking on a longer journey toward digitization and that there would be a lot of work involved. But we were pleased to have a single point of contact.” After all, internal data first had to be harmonized and interface issues clarified with the providers represented within the company. “It would have been extremely difficult for us to handle this on our own,” recalls the member of mechanical manufacturing.

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Ingo Kolberg, Senior Sales Manager at COSCOM, also looks back on that time: "On our recommendation, BERG decided not to simply replace one tool management system with another. Instead, we emphasized the advantages of using future-proof processes and data — including production information, machinery, NC programs, tool management, and production-related ERP data — all controlled via a central data platform." The focus was placed on the complete article reference of the production order, from the NC program through to machining — in other words, the entire process chain. "And what was promised was delivered. Today, everything is clearly structured. For each article, all relevant process information is displayed centrally in a single digital production data sheet," says Oliver Oberkoch enthusiastically.

Image 3: The machine park at BERG comprises a total of 18 turning and milling centers as well as grinding machines. Production data is visualized via COSCOM InfoPOINT VM terminals directly at the NC machines.

Image 4 (from left to right): Ingo Kolberg (Senior Sales Manager, COSCOM), Dirk Deppe (Mechanical Manufacturing, BERG), and Oliver Oberkoch (CAM Programming / Production Planning, BERG).

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Everything Revolves Around the Central COSCOM ECO-system

COSCOM's new process network connects the internal system landscape with its "satellites" on the shop floor. The central data hub is **FactoryDIRECTOR VM** (Virtual Machining), where all production information is stored in a structured manner. This includes article master data and work plan data from the ERP system. BERG uses APplus as its leading ERP system. All data and information generated on the shop floor is now assigned to the versioned production item and the corresponding work sequence within the work plan in the central database.

FactoryDIRECTOR VM serves as the operational hub for integrated application systems such as:

- the ESPRIT Edge CAD/CAM system
- virtual machines
- turning and milling machining centers
- the HAIMER tool presetting device

Production data is visualized exactly where it is needed via **InfoPOINT VM** terminals located close to the machines.

All Together at One Table

Integrating satellite systems cannot be taken for granted. In fact, it requires significant coordination and project management – areas in which COSCOM has built up extensive expertise for more than 40 years.

"To ensure that all systems work together smoothly, many different interests must be aligned and coordinated," explains Ingo Kolberg.

The project team therefore included internal project management and shop floor users at BERG as well as system providers such as **APplus**, **Pimpel (ESPRIT CAD/CAM system)**, and **HAIMER Microset** (tool presetting device).

Taking the lead in process integration is essential. As Kolberg notes, "many system providers focus on selling their products but do not employ their own process integration specialists." Numerous satisfied customers and integration partners demonstrate that **COSCOM has earned its reputation as a "director" of complex digital production environments**.

"Renowned system, tool, and machine manufacturers now approach us to ask how their data should be provided so that it can be optimally used for shop floor digitization. We rely on modern REST services and other contemporary communication technologies to connect these systems effectively," says Kolberg.

The company also maintains close cooperation with CAD/CAM providers. "Some even have their interfaces certified by us. But we don't talk to customers about interfaces – we talk about the benefits of integrated processes to achieve their specific digitization goals."

For BERG, this integration brings clear advantages. **Digital twins of tools** help optimize setup times and increase tool reuse by providing transparency about which CNC programs previously used a specific tool.

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ToolDIRECTOR VM can also **communicate directly with the CAM system**, allowing tools to be exchanged as needed during programming.

Another highlight is the intelligent process network within the COSCOM ECO-system. The CAM system enables bidirectional information exchange – even “backwards” if tools were changed during the execution of a CNC program.

Further benefits arise in the programming workflow. The ESPRIT CAD/CAM system can be launched directly from the COSCOM ECO-system together with the associated manufacturing data. When the CAM session ends, all tools used during programming are automatically documented and stored transparently.

Transforming tool data into a process-ready digital twin requires significant expertise. Because interfaces between integration partners evolve over time, this expertise must be maintained continuously.

COSCOM therefore provides professional project management for process integration. Its Dortmund office also hosts a specialized team dedicated to these tasks.

Everything Clean and Organized

Shop floor digitization at BERG has made impressive progress.

More than

- 5,000 items
- 15,000 CNC programs
- over 1,000 digital tool twins

are now managed within the system.

“In the past we sometimes created duplicate tools simply because we lacked an overview – the same tool might exist under two different master data records,” recalls Dirk Deppe. That problem has now been eliminated.

A built-in name generator within the COSCOM ECO-system ensures consistent tool naming conventions. These identifiers are automatically generated and later transferred to the ERP system for storage in the corresponding tables.

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Image 5: The HAIMER tool presetting device is also integrated into the process and exchanges data with the central COSCOM tool management module, ToolDIRECTOR VM, from the setup center.

Cost Optimization Through Tool Usage Transparency

The data flow from the ERP system to the COSCOM ECO-system is already working smoothly.

“However, we still need to verify whether the reverse data flow works reliably, because significantly more shop floor-relevant data can be generated in COSCOM than in the ERP system,” explains Oliver Oberkoch.

Additional ERP integration is planned via **COSCOM warehouse functions**. The COSCOM warehouse modules extend ToolDIRECTOR VM and enable direct communication within tool logistics processes. Storage location management, inventory control of tool components and complete tools, and automatic identification of missing parts all contribute to improved tool availability. Connecting these functions to the process-controlling ERP system completes the tool logistics chain.

“ToolDIRECTOR VM provides transparent usage reports,” explains Kolberg. “You can see exactly in which articles, CAM or NC programs, on which machines, and with which tool components specific tools were used.”

This transparency enables detailed evaluations of:

- tool consumption
- procurement planning
- actual process costs

The experience gained from this continuous process knowledge can then be used economically in future production planning.

High Acceptance Among Employees

Oliver Oberkoch is satisfied with the progress achieved so far. “All activities are displayed in a single user interface. Employees no longer have to search for information across five different systems. This has significantly reduced the training effort.”

Initially, some workers were skeptical about the new digital environment. However, this quickly changed. “Employees soon realized that the COSCOM system actually works very well – even better than the previous solution. Networked information can now be documented directly in the digital information sheet or used during shift handovers, for example to record recurring issues when running CAM programs.”

Image 6: On the digital setup sheet displayed at the InfoPOINT terminals, operators can see all the information they need to process the job.

At a Glance – The COSCOM ECO-system at Berg & Co. GmbH

The tasks:

- New tool management and DNC connectivity following the transition to a modern IT infrastructure
- Paperless information and graphical visualization directly at the machines
- Central database for manufacturing and tool data, including the tool presetting center
- Reliable NC program management with audit-proof change tracking
- Integration with the APplus ERP system
- Standardization of drawing and NC program management
- Reusable and process-reliable machining workflows

The solutions:

- Replacement of legacy interfaces with modern REST-based communication between ERP and satellite systems
- Implementation of ToolDIRECTOR VM for comprehensive tool management
- Modular system architecture enabling scalable digitalization
- FactoryDIRECTOR VM as the central platform on the shop floor
- Single source of truth and digital thread across all connected systems
- Data visualization via InfoPOINT VM directly at the NC machines

About Berg & Co. GmbH:

In the high-tech region of East Westphalia-Lippe (OWL) around Bielefeld and Paderborn, business and science work hand in hand, e.g., in close proximity to companies such as HAIMER Microset, DMG MORI, etc. In the “it's OWL” initiative, over 170 partners work closely together to develop intelligent products and production systems. Bielefeld is also the headquarters of Berg & Co. GmbH Spanntechnik (“BERG Spanntechnik”). Decades of experience in implementing application-specific clamping technology and a team that consistently surprises its customers with creativity in meeting technical challenges have contributed significantly to the company's enormous reputation. Today, BERG Spanntechnik is a recognized partner of the machine tool industry throughout the world.

The company was founded in 1918 by Wilhelm Berg. In 1956, Karl Bernhard Grautoff took over the company from his father-in-law, and today it is managed by Georg Grautoff, the fourth generation of the family. Of the approximately 150 employees, ten work in product development, who are also involved in Industry 4.0. For example, sensors are installed in clamping systems to collect data on the condition and clamping process. Regular collaboration with Fraunhofer IWU also ensures product innovation. The production area covers 5,000 m2 and the vertical range of manufacture reaches up to 100%.

Further information is available at: **www.berg-spanntechnik.de**

About COSCOM Computer GmbH:

COSCOM – Software, Consulting and Projects – for Digitalization in Machining

COSCOM is a leading software system house that standardizes, networks, and optimizes production data in the machining industry. The connection between the ERP system and production is a top priority. Projects are implemented around the CNC machine in tool management, tool and data management, CAD/CAM and machine simulation, as well as with Infopoint/DNC networking. Competence in consulting and goal-oriented project management are the basis for mutual success – one contact person, one responsibility, one successful project!

The networking of COSCOM software products creates integrated, interface-free process solutions for connecting all participants on the shop floor. The main benefits for users are a more efficient machining process with better product quality, higher adherence to delivery dates, and lower production costs.

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COSCOM offers everything from a single source – from software development, process consulting, sales and project management with implementation to training/coaching, service, and support.

COSCOM has been active on the market since 1978, making it one of the most experienced providers in the field of manufacturing automation and digitalization in machining. Currently, around 6,000 COSCOM solutions and approximately 25,000 machines and systems are networked with COSCOM systems across Europe. COSCOM as a partner means investment security, future security, and innovation security for its customers.

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If you have any questions, please do not hesitate to contact us.

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