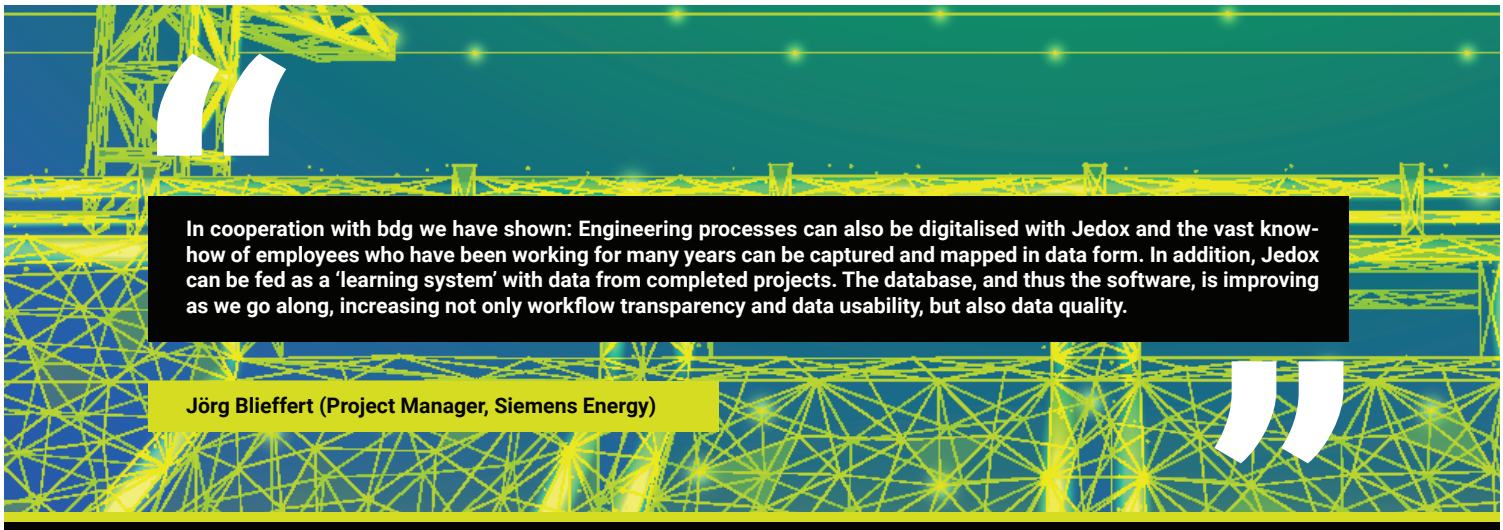
Success Story | Siemens Energy

NEXT LEVEL DIGITISATION: DATA-DRIVEN COST CALCULATION IN POWER PLANT CONSTRUCTION

“JEDOX REFINES EXCEL, BDG REFINES JEDOX” – SIEMENS ENERGY AND BDG DIGITISE ENGINEERING PROCESSES IN JEDOX



> In cooperation with bdg we have shown: Engineering processes can also be digitalised with Jedox and the vast know-how of employees who have been working for many years can be captured and mapped in data form. In addition, Jedox can be fed as a 'learning system' with data from completed projects. The database, and thus the software, is improving as we go along, increasing not only workflow transparency and data usability, but also data quality.

Jörg Blieffert (Project Manager, Siemens Energy)

About Siemens Energy

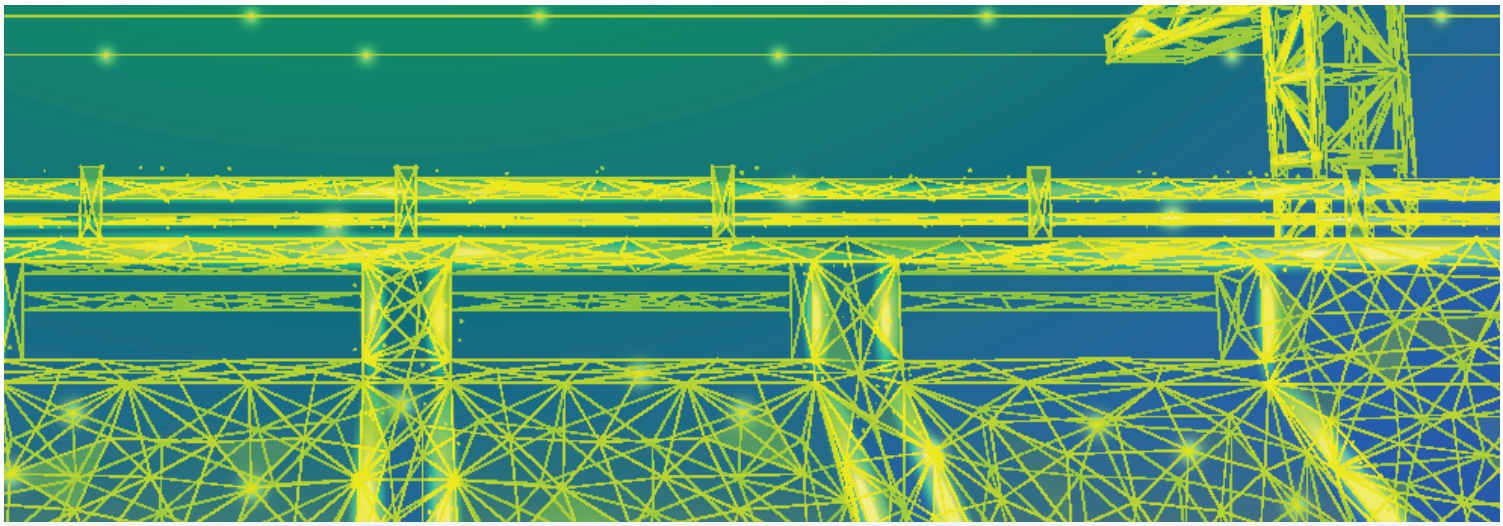
Siemens Energy is one of the world's leading energy technology companies. The company works with its customers and partners on the energy systems of the future, supporting the transition to a more sustainable world. With its portfolio of products, solutions and services, Siemens Energy covers almost the entire energy value chain – from power generation and transmission to storage. The portfolio includes conventional and renewable energy technology, for example gas and steam turbines, hydrogen-powered hybrid power plants, generators and transformers. More than 50 percent of the portfolio is already decarbonised. Through its majority shareholding in the listed company Siemens Gamesa Renewable Energy (SGRE), Siemens Energy is one of the global market leaders in renewable energies. An estimated one-sixth of the world's electricity generation is based on Siemens Energy technologies. Siemens Energy employs more than 90,000 people in more than 90 countries worldwide and generated sales of approximately €27.5 billion in financial year 2020.

Executive Summary

- Agile development of a modular hardware cost calculation in the quotation process
- Establishment of process digitalisation and automation in the preparation of quotation projects
- Significant time savings through database-supported cost calculation
- Mapping of individual calculation logics down to the material level
- Realisation of a "Data Driven Calculation" through the use of historical data from completed power plant configurations
- Workflow and reporting functions increase transparency as well as information quality and security

Brief Profile

Customer	Siemens AG / Siemens Energy
Region	Munich, Germany
Sector	Energy, Manufacturing
Number of users	30 (planned 100)
Department	Engineering in the area of Gas and Power, Generation Solutions
Software	Jedox
System environment	Jedox Cloud (Azure/Windows Server)



STARTING POINT

Traditionally, the calculation of hardware costs in the quotation process for power plant construction at Siemens Energy was carried out using self-developed MS Excel-based calculation sheets (so-called "back-sheet tools").

Hardware costing is a technical process in the bidding process, in which experienced engineers first design the technical solution and, based on this, determine the costs for a power plant construction – an essential step in the bidding process. Beyond the pure cost calculation, quantity structures for the logistics and assembly units are also generated in this process to enable their cost calculations as well. The processes of the individual departments are synchronised in a global process for quotation generation and order placement.

It is therefore a collaborative process in which many different trades in the supply chain are involved. The calculation basis of the backsheet tools is mainly composed of empirical values, data from reference projects and multi-purchase agreements. They were continuously adapted within the individual engineering trades to their respective costing requirements.

In addition to data from reference projects, quantity structures, procurement data and supplier data, project-specific data must also be included in the cost calculation, which is often based on the engineers' experience – for example, prior knowledge from power plant construction under unusual technical boundary conditions (for example, specific fuels).

Such a calculation is therefore a highly complex data mesh. Now the cost calculation in tender projects was to be realised on the basis of a database-supported tool. For the tender of this project, Siemens Energy drafted a catalogue of requirements and investigated various database solutions. The decision-making process was to be supported with various PoCs (proofs of concept). In this process, bdg convinced the Siemens Energy selection committee. The multidimensional database system from Jedox was selected as the software.

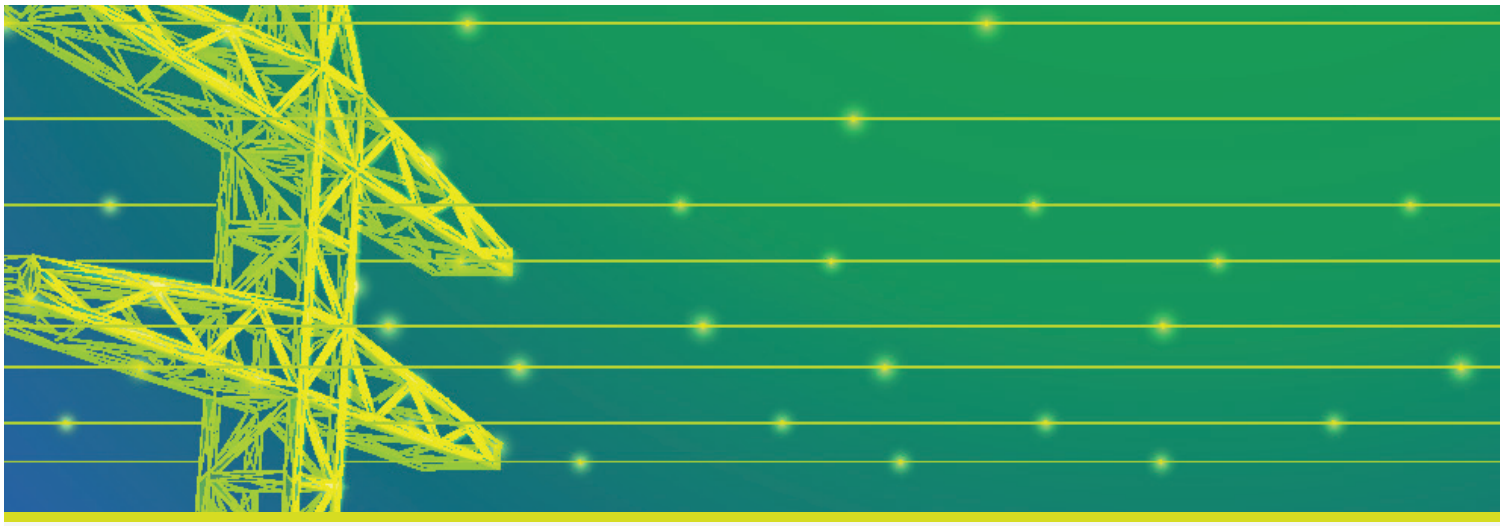
Competitive offer calculation and supplier selection form the basis for economically successful projects. The planned optimisation and digitalisation of these business processes thus represents a significant component of the value chain.

PROJECT GOALS

The first defined project goal was the creation of a prototype for the electrical engineering trade: bdg specifically used the standard functions of the Jedox suite to be able to realise the needs and individual calculation logics of Siemens Energy.

In order to achieve this goal, the engineers' many years of experience were to be integrated for the various trades. The Excel data sheets used so far were to be replaced by an automated Jedox solution with the same functions in order to reduce the time spent by the staff, increase the quality of information and integrate the collaborative processes in a technical platform.

This also meant reducing the number of interfaces and thus sources of errors and improving communication and information exchange. In addition, Jedox as a central data platform should contribute to a reduction in isolated applications.



Competitive offer calculation and supplier selection form the basis for economically successful projects. The planned optimisation and digitalisation of these business processes thus represents a significant component of the value chain. The project is emblematic of an important and value-adding contribution of digitisation projects in the BI environment. Flexibility and integrity in particular are important properties of the Jedox BI/CPM suite and thus the basic prerequisites for being able to map individual and complex processes in a data-driven platform.

APPROACH AND SERVICES PROVIDED

The work of bdg Consultants initially took place during a phase of reorganisation within Siemens. This brought with it some special challenges. Among other things, the responsibility for the project changed to another organisational area within Siemens; the decision to use Jedox as the software for the database-supported cost calculation then had to be reconfirmed. bdg and Jedox were once again able to successfully convince Siemens Energy.

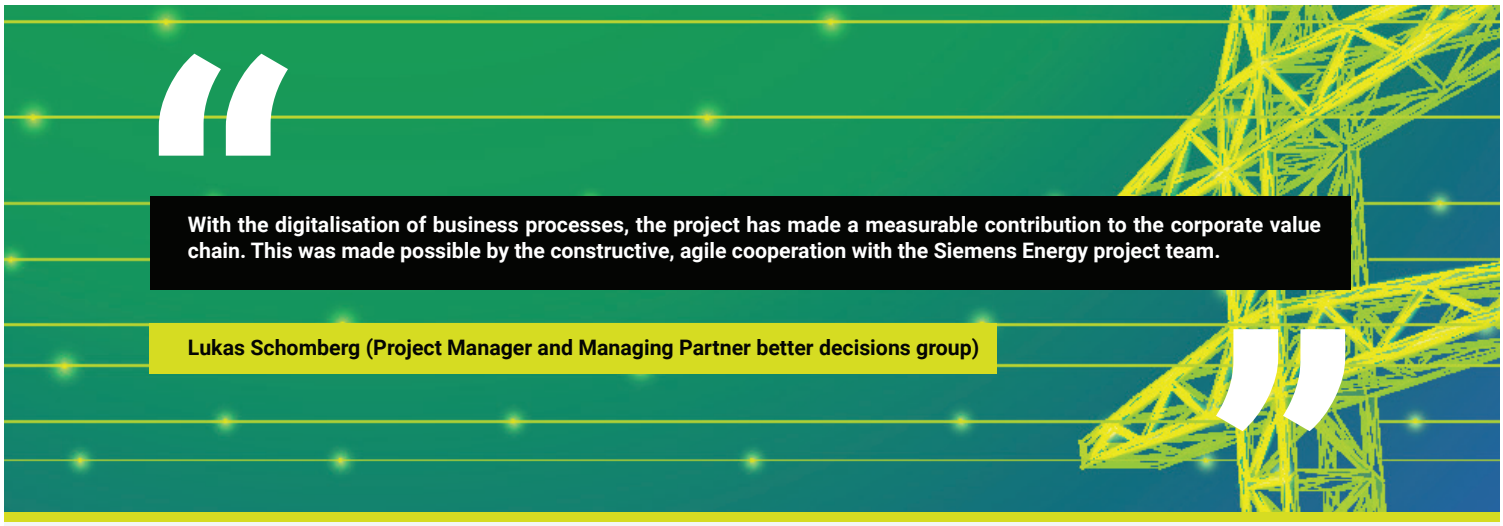
Siemens Energy and bdg then set up an agile project team and established collaboration processes to jointly realise and further develop the customised software solution in Jedox. The project manager and the product owners of the affected trades acted as the core team. In addition, the future users of the system, tender managers and cost estimators, were involved in the development from the very beginning. In this way, all requirements could be comprehensively taken into account and the acceptance of the users for the new system was promoted from the outset.

The scope of the database solution includes various mechanical and electrical components and systems. In addition, enquiries with suppliers and comparable procurement processes from the area of SCM (Supply Chain Management) are also integrated.

The project team deliberately chose the agile SCRUM approach as the project management model, in consultation with the specialist units. The development is divided into cycles. For each development cycle, the so-called sprint, interim goals were defined in advance by the product owners. During the sprint, the developers and consultants from bdg implemented the goals. Tasks that arose in between were included in a worklist, the so-called backlog. At the end of a sprint, bdg presented the results, which were approved by the respective product owner. Functions that were unfinished or needed to be improved were transferred to the next sprint. This procedure corresponds to the best practice experience of bdg and Siemens Energy and can be backed up with a lot of detailed knowledge from this side.

Through regular coordination, the participants can test on MVPs (Minimum Viable Products) that have already been created. This approach greatly facilitates coordination between product owners and developers, as the testers constantly generate actionable feedback. As a side effect, the project team can transfer partial solutions into operational use at an early stage. Instead of a monolithic tool that is only released for use by all users at the same time after it is completely finished, partial modules are continuously created that can be used successively by the end users.

During the project, the electrical engineering department was the “spearhead”. This is where the first operational experience was gathered, which was then fed back into the development cycle. A procedure that benefited both the electrical engineering itself and the other trades.



With the digitalisation of business processes, the project has made a measurable contribution to the corporate value chain. This was made possible by the constructive, agile cooperation with the Siemens Energy project team.

Lukas Schomberg (Project Manager and Managing Partner better decisions group)

This interdisciplinary way of working also had the very desirable effect of establishing an improved exchange of information between the trades, which had not taken place to the same extent with the previous Excel stand-alone solutions. Thus, the new system enabled increased best practice sharing.

Templates for new calculation modules could be derived from the partial solutions already developed. In this way, a "toolbox" with Siemens-specific templates was created, which subsequent projects can fall back on. The result: a continuously increasing efficiency in development.

The bdg experts trained the system users already during the development and later on the completed partial solutions of the application. This also improved the participation of the system users in the development process itself. In addition to power users, who can participate in the development themselves after thorough training, end users are also trained to acquire solution-specific knowledge without developing themselves.

The close cooperation between bdg and Siemens Energy during implementation was an important success factor.

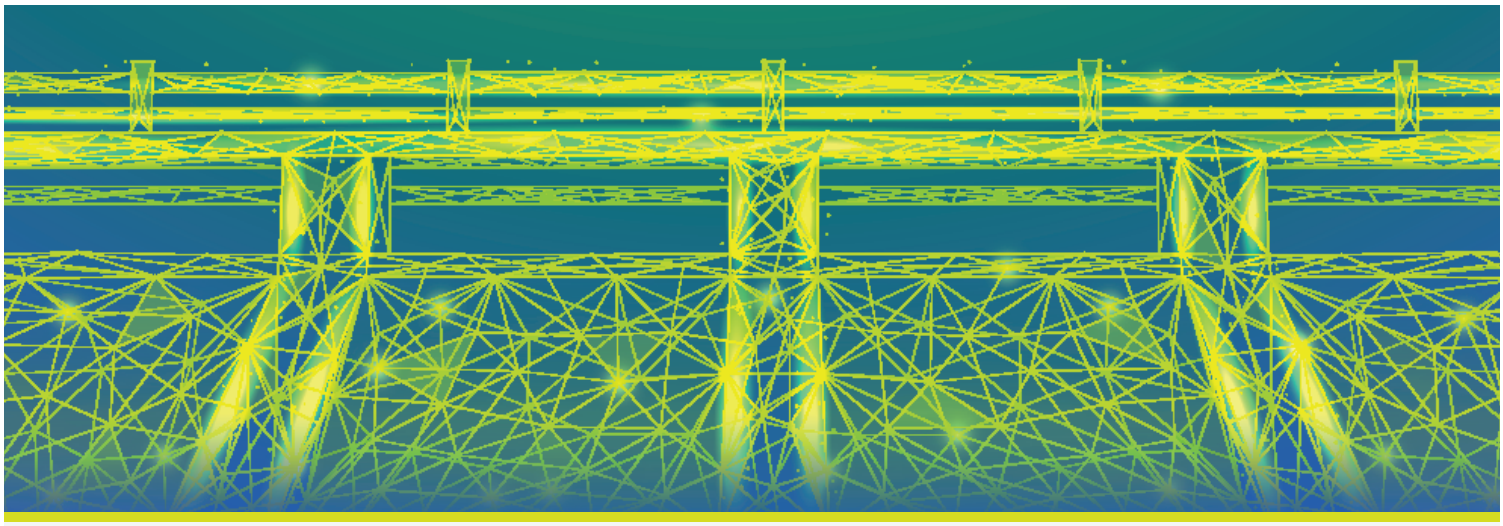
Siemens is a major international corporation with a matrix organisation. Navigating within the corporate structure and ensuring goal-oriented communication was initially a challenging task for the bdg consultants. The aforementioned restructuring led to changing responsibilities within the company and changing contact persons in a project where many detailed questions have to be clarified, these are particularly big challenges. Through intensive cooperation in a spirit of partnership, a culture of communication was established that made a lasting contribution to the success of the project. Siemens Energy and bdg built up the joint team in a targeted manner, the engineering department defined contact persons and clear project ownerships and provided the bdg developers with all the necessary information. The cooperation with the engineers was outstanding. The data required here is highly specific, so an extensive exchange of knowledge is absolutely essential.

bdg set up consultant teams that impressed with their Siemens-specific understanding of processes and systems. The Siemens Energy specialists were prepared to explain their work with patience and depth. This allowed bdg's IT experts to fully develop their quality and familiarise themselves with the specific Siemens Energy topics. The consultants' broad professional background proved to be an advantage – several have a background in engineering. A strong basis of trust and mutual appreciation also had a positive effect on the course of the project – during development as well as in the actual application and training. The cooperative approach was a decisive factor for bdg to establish itself as a strong Siemens Energy business partner.

THE RESULT

In the project with bdg, a successful database-supported system for cost calculation in the bidding process for power plant construction has been established at Siemens Energy. The previous calculation based on Excel data sheets has been functionally replaced and the development is currently entering its next phase to take advantage of further benefits of the Jedox application.

Jedox as the software used for this purpose is generally enormously versatile and capable of mapping almost any requirement. In addition to numerous standard functionalities, prefabricated function modules (e.g.



workflow or navigation) of bdg ONE were used in the project – "Application as a Service" solutions developed by bdg based on best practices – among others for the energy sector. These module components of bdg were supplemented with customised Siemens Energy calculation logics, which are also available for future further developments. In the project described here, bdg made use of the full functionality of Jedox and proved it: In addition to controlling processes, Jedox can also digitalise comparatively complex engineering business processes – if the software is implemented by a team of experts.

A major benefit of the new system is that it becomes more powerful as it is used: Information from quotation processing and project handling continuously increases both the scope and the quality of the database, as the appropriate costing approaches can be selected and compiled on a project-specific basis from a constantly growing amount of data. In addition, cost analyses can be created and the costing effort reduced, as the costing basis is constantly being made more precise.

With templates from bdg ONE, a workflow element has also been implemented to increase transparency about the status of quotation processing. In addition, input and query permissions can be set up, improving information quality and security. With specially developed dashboards and reports, it is possible to query the current data stock at any time. And all this in real time. Time-consuming enquiries and queries are no longer necessary, leaving more time for value-added work. The data research of the different system users is also no longer necessary.

Another advantage: In the future, transfer work that was previously necessary in the case of media discontinuities can be avoided, as the entire workflow can take place in the Jedox system. The harmonisation of sub-processes within one platform has thus been achieved, the One-Platform principle realised with Jedox as the core: this leads to a reduction of isolated applications. Jedox also has an extensive "out of the box" interface functionality that enables the integration and connection of other IT systems without any problems.

The success of the project has shown in summary: Even concrete engineering processes can be digitalised with Jedox and the know-how of long-standing employees can be captured and mapped in data form. The software can therefore act as a significant component of the value chain in the business process. In addition, the Jedox database can be filled with data from completed plants as a "learning system". So the system is getting better and better as it goes along.

In the future, other Siemens Energy divisions are therefore to be integrated into a globally oriented Jedox application landscape – in proven cooperation with bdg. Jedox applications are currently being developed for the digitalisation and automation of procurement processes (Supply Chain Management department) and for assembly (Erection Commissioning), which are to be integrated into a uniform process together with the engineering solution presented. In addition, bdg is developing applications for the areas of Finance & Controlling together with the Siemens Energy Division "Transmissions".

Jedox

Jedox is the world's most adaptive planning and performance management platform, enabling organisations to create plans that exceed expectations. Over 2,500 companies in 140 countries rely on Jedox to model any scenario, integrate data from any source and simplify cross-organisational plans across all business systems. With Jedox, you can respond quickly to change, plan for opportunities and uncover possibilities you didn't know were possible.

bdg has been an authorised partner of Jedox since 2008, underlining our extensive experience and a special position in the Jedox partner network.

The better decisions group

bdg is an international consultancy for Corporate Performance Management (CPM) and Business Intelligence (BI) solutions. We are a long-standing partner of various CPM and BI software providers and implement flexible solutions for planning, reporting and analysis.

Medium-sized companies as well as large corporations and public organisations are among our satisfied customers. It is our mission to create a solid data and information basis for our customers and thus enable them to make better decisions and achieve greater business success. To this end, we implement customised out-of-the-box applications as well as individual BI & CPM solutions in the areas of Finance & Controlling, Marketing & Sales, Procurement and Human Resources.

Our focus is on the retail, energy, financial services and manufacturing sectors. We support our customers both professionally and technically, from the selection of suitable BI technology and joint strategy development to the definition of company-relevant KPIs and complete implementation. Our range of services is rounded off by practice-oriented training and customer-oriented service.

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