CASE STUDY

Bayer AG digitalizes P&IDs and 3D models

Key facts:

Company: Bayer AG

Website: www.bayer.com

Industry: Life Sciences

Country: Germany

Octave products used: Facets P&ID *(Intergraph Smart P&ID)*, Forte 3D *(Intergraph Smart 3D)*

Key benefits:

- Increased efficiency in plant operations by improving the quality of the technical plant documentation
- Improved time-to-market and increased efficiency in project execution as current, uniform and trustworthy technical inventory data is now available for project teams
- Data-centric and standardized database for setting up a digital factory

Bayer is one of the largest global life science companies, consisting of three divisions: Pharmaceuticals, Consumer Health and Crop Science. This case study discusses how Bayer standardized engineering and operations data management and digitized its P&IDs in a quick, efficient manner with high quality deliverables.

Bayer has a wide network of locations and facilities all over the world. Most of these facilities had different legacy engineering solutions, and the work was often executed in a siloed manner. This had a negative effect on efficiency and the quality of project execution, as a lot of time was spent verifying documentation and updating data to the correct formats.

"It is important for us to execute projects quickly and efficiently, while improving time to market," said Albert Becker, Head of CAE & BIM Support at Bayer Engineering & Technology. "If we do not have reliable asset documentation in a standardized and digital format at the beginning of the project, we have to invest a lot of valuable time to prepare the data for operations. Because of these challenges, Bayer started a digitalization project to introduce standardized tools to be used across sites and teams for creating, editing and managing P&IDs and 3D models. The project's goal was to migrate the P&IDs from the legacy systems into a centrally managed new solution, ensuring compliance with Bayer's generic and site-specific requirements and all industry standards.

The project had a tight schedule and budget and had to include all essential drawings and documentation. In addition, engineering and operations would no longer be managed separately from one another, but in a common world with a project area and an as-build area. This is to ensure that the technical documentation will be up to date and trustworthy at all times.

All migrated data had to be made accessible across different functions and would serve as the basis for the new standardized engineering data management and an integrated engineering tool landscape.

Overcoming challenges

At some sites, the legacy systems in place were almost 30 years old. Some of these systems were not supported by the latest operating systems and had to be updated urgently. At the same time, many of the Bayer sites also used different tools to create and manage the P&IDs. This made project execution and overall productivity enhancements challenging, as the project teams lost a lot of time verifying the received documentation and updating it to the latest file formats.

The project scope included the migration of the documentation, across different locations, into a common data format and structure, in new software. Extended correction, review and consolidation of the data was also done before migration.

"The lack of standardized and digitalized project execution capabilities can have a huge impact on efficiency, as the engineering teams have to invest valuable time to review and verify data."

Albert Becker
Head of CAE & BIM Support, Bayer Engineering & Technology



Bayer AG started a digitalization project to introduce standardized tools to be used across sites and teams for the creating, editing and managing P&IDs and 3D models.

"The lack of standardized and digitalized project execution capabilities can have a huge impact on efficiency, as the engineering teams have to invest valuable time to review and verify data," Becker said. Collaborative design and engineering approach with the automation of the deliverables, including bills of material, allowed it to meet these combined challenges.

Realizing results

The first step of the project was to find a successor for the existing legacy CAD systems used across the different sites. Bayer's management team started by capturing the requirements from key users in the different locations. After this, the budget and timeframe for the project were set. After a period of careful consideration, Bayer chose Facets P&ID as the future go-to solution for creating and managing the P&IDs for engineering and operations. The solution was chosen mainly because of the following reasons:

- Intelligent software capabilities that support a data-centric approach
- Having current and trustworthy P&ID data available for engineering and plant operations in one environment and in a shared format
- The flexibility of integration of the solution enables a long-term roadmap for future development of the engineering environment
- The ability to make P&IDs available in a virtual environment allows collaboration between external and in-house teams
- Ability to set rule-based control of the diagrams

The next step included creating a shared configuration of the solution across the different Bayer locations and any upcoming projects. To make the migration easier, Bayer chose the standard configuration of Facets P&IDs for the new projects, which facilitated the migration as all the newly created P&IDs were in the correct format automatically.

At the same time, the migration of the old P&IDs into the new system started in the six key Bayer locations. The migration work was carried out in two phases: the first step was a small number of selected P&IDs (30-50) from each location. This was done in a virtual environment during the COVID-19 pandemic. A digital migration tool was developed and refined during the migration of the first 300 P&IDs and the quality of the migrated documents was checked by an external consultant.

After the successful pilot, the initial migration began and covered more than 5,000 P&IDs. This included more than 100 million data records. "In our migration project to Facets P&ID, we have exceeded our expectations and achieved our goal of 100% data quality! And not only did we migrate the data, but we also fixed potential legacy issues from previous years to create a true digital representation of our facility.

"My most important recommendation is to not do this [an engineering data migration project] process on an ad hoc basis in individual projects but approach the work in a consistent and centralized manner across the board."

Albert Becker
Head of CAE & BIM Support, Bayer Engineering & Technology

This made it easier for our operations department to get started and to accept the new software solution.

"In our migration project to Facets P&ID, we have exceeded our expectations and achieved our goal of 100% data quality! And not only did we migrate the data, but we also fixed potential legacy issues from previous years to create a true digital representation of our facility. This made it easier for our operations department to get started and to accept the new software solution.

Facets P&ID will support us to digitally represent the current, as-is, status of our facility and keep it up to date," said Martin Tork, Head of Technical Documentation at Bayer Pharmaceuticals. "We were pleased with the collaboration with Octave – the transparency of information and clear communication left little to be desired."

Moving forward

After the migration, all the Bayer sites continue to use Facets P&ID for creating and managing technical asset documentation. The software is used to create, edit and manage P&IDs across the different lifecycle phases of the facilities, as well as for the new CAPEX projects. Smaller tasks are done in-house by the CAD department, but most of the drawing work is done by external service partners (EPCs). Due to the digitalized approach and the efficiently designed engineering workflows at Bayer, external contractors and Bayer in-house teams can collaborate in the same virtual environment, which is provided and managed by Bayer.

This enables Bayer to maintain control and ownership of its data while saving time as no complicated data transfer between different environments is



needed. "Facets P&ID helps us to avoid inconsistencies and deliver high-quality deliverables," Mr. Tork said.

"With the implementation of Facets P&ID and Forte 3D, we have already received a good basis for digital and sustainable asset documentation. Our next step will be to establish an integrated and connected engineering tool landscape and to create a data-centric, integrated asset documentation. Quality assurance and easy data access are also very important to Bayer, and we are working to optimize automation of the processes," Becker said.

When asked about what is key when starting an engineering data migration project, Becker had precise advice: "Switching to a new system or migrating data will take time, but it's not rocket science. In our experience, most of the time will be spent reviewing and consolidating the as-built data, while the actual migration can be a controllable process if the work is carried out in a structured manner. My most important recommendation is to not do this process on an ad hoc basis in individual projects but approach the work in a consistent and centralized manner across the board." Martin Tork, Bayer Pharmaceuticals

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

©2026 Octave Intelligence plc and/or affiliates. All rights reserved.