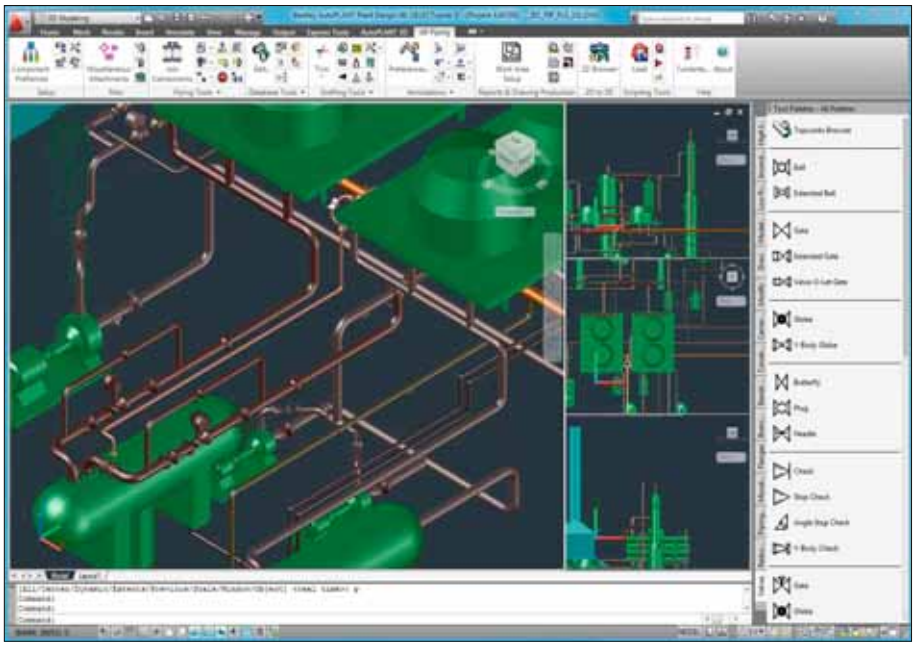


A recent Daratech study ranked AutoPLANT number 1 in a direct comparison with its competitor products. Not only on a features & functions level the AutoCAD-based software suite for plant design and plant operation has its striking pros but also on the business side.
By BERNHARD D. VALNION

THEY BECAME FRIENDS — AND VERY SUCCESSFUL

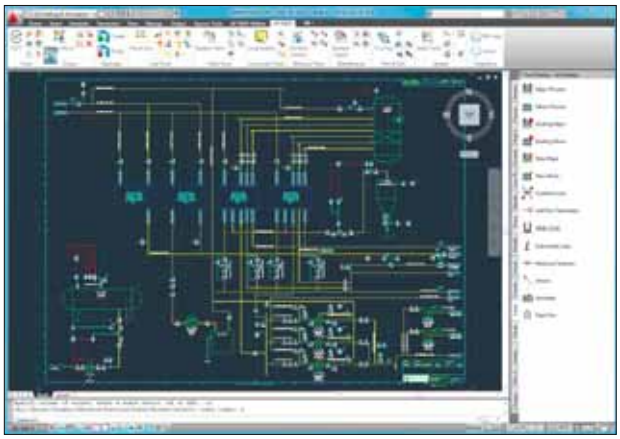
With more than seven million commercial licences, AutoCAD is the most distributed CAD application in the world. In many industry segments, like plant or AEC, you will find it as the number one in selling. From this tremendous success another application running on top of it could have been and can be benefit: AutoPLANT. This history of the most selling application suite for plant design and plant operation is at least as exciting as that of AutoCAD.

In the 1980s Jeff Hollings and Dennis Row started at the west coast in the United States with their Cal Berkeley colleague professor a company called SSD. There business activities were focused on structural analysis and on providing services to pipeline projects. They developed a product called AutoPIPE which performs pipe stress analysis — it still does it today. Over the time they firmed under the name "Engineering Design Automation" (EDA) and started reselling the CADPipe software (1989). Two years later, EDA bought a small company in the US state Louisiana named MicroCAD and began selling their line of AutoCAD-based software called "AutoPLANT". In 1993 EDA bought several products from an engineering company named Advantage and their expansion strategy went on: In 1994 another Louisiana-based company named Application Development (ADEV) was acquired by EDA. Their design tools were called ProCAD. In the deal they also got a sub-company named Pad which developed a MicroStation-based application called OmniPipe. In earlier days EDA and ADEV were bitter rivals in the AutoCAD-based market up to the merger. To avoid alienating the ProPipe user base the new combined company was named Rebis. But the shopping tour went on. In 1996 Rebis took over a company named Piecom, located in South Africa and renamed their instrumentation products AutoPLANT Instrumentation & Wiring. The 1997 edition of AutoPLANT was developed to consolidate the best features of their three design tools (AutoPLANT, ProPipe, Omnipipe). In reality it was the MicroStation-based Omni that served as the prototype for the new design. Note that Omnipipe specifications live on as the ISO 15 926-based OpenPlant specs even now! On first of July 2002, Rebis lost its indepedency but the customer base won once again. Jeff Hollings and the other members of the board decided to put the business in the hands of Bentley Systems, Inc. headquartered in Exton, US state Pennsylvania. Since in the following years the AutoPLANT business climbed up from sales record to the next this entrepreneur decision was right.

Comprehensive portfolio

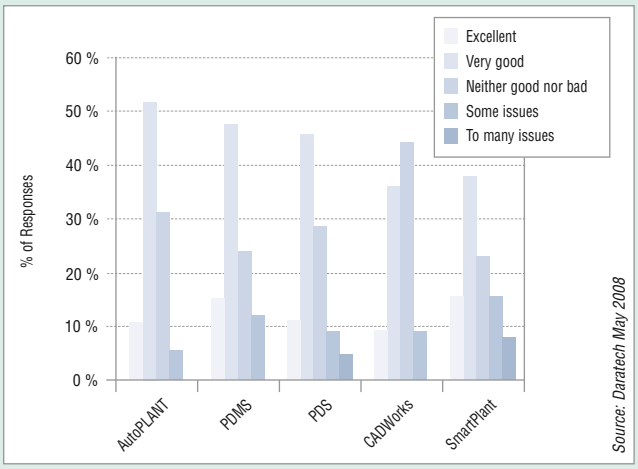
The AutoCAD-based plant design suite is used around the world on projects ranging from small retrofits and expansions to large, full-scale facility design and construction. AutoPLANT V8i — AutoPLANT Plant Design Workgroup (PDW) — provides a complete set of integrated software applications that are easy to use:

- **AutoPLANT P&IW** including Bentley Instrumentation and Wiring V8i, AutoPLANT P&ID V8i, Bentley Data Manager V8i, and Bentley Datasheets V8i for functional design.
- **AutoPLANT PDW** including AutoPLANT Piping V8i, AutoPLANT Equipment V8i, OpenPlant PowerPID V8i, Auto-



Pictures: Bentley Systems

AutoPLANT Plant Design (left) and AutoPLANT P&ID, both in the latest V8i version, in action



Up to speed as fast as one can be

In a survey, the market research firm Daratech, Inc., headquarted in Cambridge, US state Massachusetts, ranked Bentley Systems as number 1 among software platforms for plant creation and number 1 in software for conceptual plant creation.
Daratech also developed an analyzing methodology about the relative merits of 2D versus 3D plant creation and maintenance software based on the opinions of process and power industry engineers, managers, and executives engaged in plant creation, operations, and maintenance. This study found, among other conclusions, that the average time to become a proficient 3D system user was between 140 and 240 days. The fastest average learning time was for AutoPLANT software, which participants indicated had an average learning time of 140 days.

PLANT Raceways V8i, AutoPLANT Isometrics V8i, and ProSteel V8i for physical design.

- **AutoPLANT for CAE** including Bentley AutoPIPE V8i, Bentley PlantFLOW, and WinNOZL, now known as AutoPIPE Nozzle V8i. It is a set of comprehensive analytical applications for stress analysis, including pipe stress, fluid flow, pulsation analysis, and local stress analysis.

Compared to its predecessor XM the latest version V8i offers better integration with ProjectWise. AutoPLANT V8i runs on AutoCAD 2009 to 2011 (32 or 64bit).
Due to space restrictions we are not able to publish more details of all applications listed above. In the following we restricted our coverage only to a selection:

- **AutoPLANT P&ID** is an AutoCAD-based program that allows you to create intelligent piping and instrument diagrams and process flow diagrams. The latest version V8i now provides ribbon menus and tool palettes within the AutoCAD interface to enable users to insert piping components (tool palettes) and manage models (ribbon menu) in a more efficient manner. The ribbon menus contain the action, or management commands whereas the tool palettes are for placing components in the models based on the selected catalog content.

The latest version of the P&ID tool can work in a fully integrated, managed environment with ProjectWise. ProjectWise is an engineering project team collaboration system that is used to help teams to improve quality, to reduce rework, and to meet project deadlines. Moreover, P&IDs created using AutoPLANT P&ID can be reviewed and analyzed using Bentley Navigator V8i. Bentley Navigator is used by infrastructure teams to review and analyze project information.
AutoPLANT P&ID has been certified for project use with Bentley i-model Composer V8i. I-model is a container for open infrastructure information exchange and enables bidirectional feedback in dynamic workflows.
AutoPLANT Piping gives you spec-driven 3D piping design with advanced routing and editing features. Drawing production includes orthographic drawings (plans, elevations, and sections), using paper space view ports and exporting 3D model data to produce finished isometric drawings. Fully featured automated isometric drawing production features are included in the piping application. "Drawing Flattener" produces 2D drawings including elevations, plans, and sections from the 3D model.

Picture: private

Alan Leonard

AutoPLANT Equipment places equipment, nozzles, ladders, platforms, and walkways in 3D space. It provides numerous equipment, nozzle, and structure placement options, and includes primitives that may be used to construct user equipment assemblies. The use may the AutoPLANT Equipment model in the AutoPLANT Piping application to directly connect piping components to equipment nozzles.
AutoPLANT Isometrics is an intelligent piping isometric drawing application allowing either direct specification-driven drawing creation or automatic isometric creation from an piping 3D model. The combination of these two techniques ensures that for all types of piping designers have the correct tool for creating piping isometrics.
AutoPLANT Raceways is an application

for quick layout and design of intelligent 3D cable tray and conduit. This product features spec-driven conduit, cable tray and inline instruments. This application is a subset of the component modules available to the Piping application.

In April 2011, the vendor released an updated version of the AutoPLANT V8i suite, (SELECTseries 3). This version brings; new interoperability via the i-model, support for 64-bit Windows 7, and other new features. New in this release is the ability to exchange 3D i-model's based on the ISO 15 926 format and also share ISO 15 926 i-model project collaboration data via iRING. The graphical interface of AutoPLANT has been enhanced to incorporate ribbon menu's and tool palettes for more streamlined work-

"THE CAD ENVIRONMENT DOESN'T MATTER"

Senior Industry Sales Director Carsten Gerke about the underlying logic of Bentley Systems' 3D plant design portfolio and what we can expect from the nearer future.

Mr Gerke, with PlantSpace based on MicroStation, Bentley Systems already has a powerful plant design tool in the market. Why did your company buy Rebis and its AutoPLANT portfolio in 2003?
In the plant industry there are two dominant CAD platforms. On one hand MicroStation and on the other AutoCAD. To serve the important AutoCAD-base we decided to acquire the worldwide market-leader in the field, Rebis. Greg Bentley gave the strong commitment that we will further develop AutoPLANT, and we did so, just released a new version and will continue to do so in the future.

How does AutoPLANT and 3D design fit together?
AutoCAD is a 3D CAD system like it is a 2D drawing system. AutoPLANT which runs on top of it provides extra functionality for 3D planning and defines additional objects in order to optimize the plant design process. Over the last years, Autodesk has enriched the AutoCAD platform with additional 3D functionality and further enhancements like the 64-Bit support which we all support. Also a new GUI was introduced fully supported by Bentley. There is an agreement between both vendors to provide graphic libraries not only to guarantee MicroStation to AutoCAD interoperability but also to support the AutoPLANT compatibility.

There are numerous plant systems based on AutoCAD, even Autodesk by itself has launched one. In which way AutoPLANT is positioned in this highly competitive market?
Of course, the Autodesk plant suite is a direct competitor to AutoPLANT. I don't want to deny that Autodesk isn't able to develop a powerful tool for this market. But due to our tremendous experience — since the beginning of the 1990th AutoPLANT has been established in the market — we have a non negligible lead. Another aspect is its scalability: it is used for small single engineer projects as well as for the world's largest capital projects.

You mentioned the abstract term "experience". Can you give us an example?
Sure, take for example the current development activities to deliver an AutoPLANT module to design jacketed piping systems. Bentley has identified that there is a gap in the market for 3D CAD tools that deliver specific functionality to design these systems and produce the required deliverables for manufacture. To provide this Bentley has utilised the vast experience of its software development, sales and consultancy teams. Some of the guys involved are into their second decade developing, selling and supporting these design tools. That's "experience".

What has been happened to PlantSpace?
The next version of PlantSpace shall be a new version of OpenPlant. The decision was made after careful analyzing the demands of the markets and taking into future roadmap considerations. OpenPlant can be regarded as a the next generation MicroStation-based 3D plant design tool though the CAD kernel is already embedded in the system. The besides the state-of-the-art interface and functionality the new name 'OpenPlant' emphazises that the underlying data model is based on the open standard ISO 15 926 and not on a proprietary format like in AutoPLANT, PlantSpace or competing products.

Picture: Valnion

Carsten Gerke

What was the demand in doing so?
Well, the world has changed. The 21st century stands for open formats and federated data approaches – vs closed monolithic systems. It is about their data that the customers care these days and not the tool that helps them create it. The main driver is obviously interoperability – internally between various systems and externally with the eco-system. In order to achieve this the dependency on a vendor specific format and this specific vendor is seen more and more as a critical and costly path.

The new OpenPlant version is expected for Q3 of the year. What are the key features?
You are right. We will release the SELECTseries 3 of OpenPlant soon. Besides a lot of enhancements worth mentioning is that we shall deliver full DIN and EN standard support. There is no doubt that this version has reached a high level of maturity.

What is the difference between AutoPLANT and OpenPLANT on a system architecture level?
AutoPLANT is a file-based system (but of course with a database for process data) and OpenPLANT is a component-based one meaning I just manipulate objects of a database during the modeling process. The other fundamental difference between the two systems (and competitive systems btw as well) is the inherent support of distributed engineering incl the ability to work completely offline. Of course the native support of the ISO 15 926 standard describes another differentiator. However, we do also offer a mapping of the AutoPlant format to ISO 15 926 which enables all of our users to interoperate on this level. Furthermore I am allowed to say that wide parts of the OpenPlant portfolio will be usable in their an AutoPLANT environment as well. This will allow a true mix and match between different editing tools based on MicroStation or AutoCAD – not this year, but next year.

For example what?
OpenPlant Model Server can check in components of an AutoPLANT model which then can be loaded into OpenPlant Modeler for further editing. This works btw already for PDS models from Intergraph as well. We will enable a free choice in which environment the customer wants to model.

Thank you for your statements!

Interview: BERNHARD D. VALNION

flows and new pipe editing tools such as split pipe have been added.
A key aspect of this release is the ability to run in a 64-bit environment. Most users buying new hardware will be opting for 64-bit Windows 7 with 64-bit AutoCAD. AutoPLANT V8i (SELECTseries 3) is fully compatible with 64-bit Windows 7, 64-bit AutoCAD and 64-bit Microsoft Office 2010.
As the new version of AutoPLANT V8i 3D supports the creation of i-models based on the ISO 15 926 schema, AutoPLANT has increased its potential for interoperability with 3rd party plant software products. At the same time, the (SELECTseries 3) release of AutoPLANT V8i further enhanced the interoperability with other Bentley collaboration products, including ProjectWise V8i (project collaboration and document control), Bentley Navigator V8i (iterative project review), and Bentley OpenPlant, the first 3D plant modeling software to natively use the ISO 15 926 data scheme as specified by the iRING user community.
What makes AutoPLANT so very special? Our editor took a look together with Alan Leonard, corresponding Product Marketing Manager at Bentley, behind the scence of its success. "Unique is that it can be configured to a single workstation as well as that it fits into a multi-billion US dollar project environment", Mr Leonard comments the flexibility of the software. Than the Product Marketing Manager refers to the briefcase mode which was released with previous versions "Even if you are working on a huge project you can extract a little piece of it out for your own workstation — say: because you are small consultant or an expert for a special piece of the plant — and work, then come back and put the brief case back in the major model and all your changes and update are uploaded."

ISO 15 926 interoperability

The latest AutoPLANT version fully embraces the neutral data exchange standard ISO 15 926. As reviewed in (1) Bentley's OpenPlant portfolio is designed to store the data structured according to the ISO 15 926 scheme. It is positioned in the marked as a kind of a mid-range tool suite as suitable for bigger projects.
"We are not going to change the data structure of AutoPLANT internally", Mr Leonard assures. All remains as it was. But an adaptor was designed either to work in the AutoPLANT schema or to export data into an ISO 15 926 schema. "We are in an ongoing process of developing that further." More news in that way are expected in the next six to twelve months.
The advantage is e.g. that an expert working on a single seat environment at home can put his data into an ISO 15 926-compliant world. "This single engineer doesn't have to change his skills, but he can now participate in a multi-billion US dollar project." Vice versa, an owner-operator or a large EPC decides pro exchange data mechanism based ISO 15 926 scheme they don't have to eliminate the small consultant resulting in a loss of special expertise. Mr Leonard explains: "Before the OpenPlant product was launched the project owner would say: You have to deliver the data in a dedicated format let's say PDS. And really, all the EPCs had no other way of dealing with that just doing the work in PDS which not rarely eliminated all of your small EPCs in project because they cannot afford PDS!"
The AutoPLANT ISO 15 926 compliance opens the door in both ways. "The owner-operators are no longer constrained saying 'We want this high-end data deliverables from everybody so you must use this specific tool.' Now they can say: 'Use the plant design tool you are most efficient with it as long as you can deliver in ISO 15 926 format.'" Bentley is making sure, as Mr Leonard states, that contractors are able to create i-models in the ISO 15 926 schema to take over data in the OpenPlant Isometrics Manager. "That is the first step of being fully compliant working with the OpenPlant portfolio."

File handling

And what does the AutoPLANT expert recommend for the file handling? "The usage of ProjectWise is the best way because of all the security aspects, versioning of deliverables and everything else in collaboration environment are ensured." But, on the other hand, there are a lot of users using the Vision viewer which is another nice way to organize, search, and look for drawings. So, what to choose? It depends on the tasks to face with and the budget: "ProjectWise is a great and very powerful tool but there are costs associated with", Mr Leonard admits. Many customers working on multi-billion US-dollar projects using ProjectWise as their repository and they are very happy. "If there is a single AutoPLANT user he can connect into that ProjectWise managed environment." This user doesn't have to change his skill set to participate in a large ProjectWise-base project because he needn't to run his own ProjectWise server.

Infocorner
(1) digitalPLANT 6/2010, pg. 53, Göller, Baden-Baden
For further information visit
www.bentley.com/en-US/Products
