



UniversalReporter – generate complex reports easily

Introduction:

UniversalReporter provides a complete solution for reporting and supports a number of different engineering systems. It is simple to use and allows the rapid generation of report templates using Microsoft Excel without the need for programming skills or deep system knowledge of the native applications. **UniversalReporter** allows users to generate reports across a number of applications simultaneously for the purpose of data validation or the generation of a composite report.

Common issues:

Report generation is a key requirement for all engineering projects and is required from most applications used. Some of the key issues relating to report generation are as follows...

- As databases have become necessarily more complex in structure, the level of knowledge needed to be able to generate reports has also increased. This has led to needing highly skilled people with considerable SQL experience and deep knowledge of the database structure of the native application. These people are not always readily available meaning that report template generation may be delayed.
- Even if people are available with the relevant skills and experience, generating the report template can still be a timely (and costly) exercise to perform.
- The systems used within engineering may have different reporting engines or setup requirements, even if the systems are supplied by the same vendor. This adds to the complexity and skills needed for report template generation.
- It is difficult, and sometimes impossible to be able to verify changes in engineering content between two specific dates.
- Generating a composite report where data is held in more than one system can be challenging.
- Verification that data is consistent when information is held in several systems can be difficult.
- Most people are familiar with Microsoft Office products like Excel and Excel is widely used within the engineering community. Despite this, Excel is usually a final output rather than a tool that is used for the creation of report templates.
- Even if report templates have been made available at the beginning of the project, there is a regular need to generate ad-hoc reports. Projects cannot afford the time delay to wait for a new report to be written and provided to them, but the generation of such a report is likely to be too difficult for most engineering users.

UniversalReporter has been specifically designed to address the above issues.

Report- and EditAdapters - one adapter for many uses:

Data is made available to the **UniversalReporter** by ReportAdapters and EditAdapters therefore there is a pre-requisite to have at least one of these for use alongside it. The **ReportAdapters** are off-the-shelf solutions that access the native applications and provide a cache of data that can be used by a number of applications developed by CAXperts. They are not stand alone applications in their own right and are intended to be used in conjunction with **UniversalReporter**, **Universal Plant Viewer**, **ProgressXpert** or **QualityAssuranceModule**. Investing in a **ReportAdapter** for one of these applications means that it can also be used with the others without additional cost.

CAXperts **EditAdapters** extend the capability of the **ReportAdapters** for some applications to allow data to be edited in a spreadsheet style interface and then written back to the application. All of the functionalities of the **ReportAdapter** are available within the **EditAdapter**.

Contact & information:

CAXperts GmbH
Carl-Zeiss-Ring 4
85737 Ismaning – Germany

P.: +49 89 96 97 72 0
F.: +49 89 96 97 72 11
E.: info@caxperts.com

Intergraph:

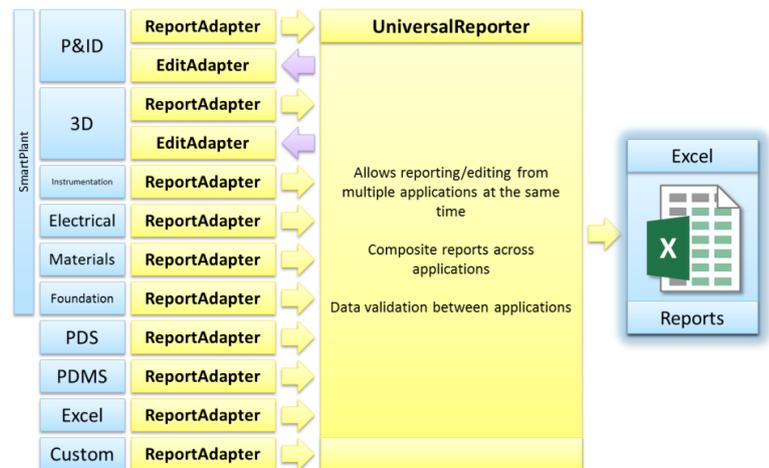
- SmartPlant® P&ID (also data editing)
- SmartPlant® Electrical
- SmartPlant® Instrumentation
- Smart 3D (also data editing)
- SmartPlant® Materials
- PDS®

AVEVA:

- PDMS

Others:

- It is relatively straight forward for CAXperts to provide a custom **ReportAdapter** to enable access to data from any other commercially available or in-house developed system. Please contact CAXperts to discuss your requirements further.

**Flexibility of data usage:**

The data cache produced by the **ReportAdapters** can be regenerated at the time the data is needed providing access to up to date, real time information. In some cases there is a major benefit to archive the data caches to enable comparisons between the statuses of data over different points in time. The ability to archive the data and access it externally to the original application also provides the capability of distributing the data to other parts of your organisation or indeed to completely different companies for them to use.

Any cache of data that is stored for use off-line can also be time stamped with an expiry date to ensure that any use of data is in line with corporate information management policies.

Systems supported:**Benefits:**

- The **ReportAdapters/ EditAdapters** provide an off-the shelf solution to connect CAXperts applications to a number of commercially available systems
- Man-hour savings when editing data through a spreadsheet style user interface (EditAdapters)
- Data caches can be archived to allow comparisons between the statuses of data over different points in time
- The data structures produced are simpler for data reuse outside of the original application
- Data can be portable to allow distribution without the need for the native application

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Writing changes back (EditAdapters):

Any values that are changed will be written back to the application using the application program interface (API). This helps to ensure that all changes are applied correctly and that data that should not be changed will not be.

There are two options available for writing back P&ID data, either with or without system editing. When system editing is selected, all changes will also be propagated to connected items as defined in the rules.

Certain values cannot be changed, for example any value that would instigate a geometry change within the 3D model such as bore size within SmartPlant 3D.

After updating and depending on necessity, it may be necessary to refresh the cache to see which values were changed additionally because of rules being applied within the application.

Composite reports:

UniversalReporter has the ability to open data sources from multiple applications at the same time. This opens up the possibility to generate composite reports using data from within the different applications such as combining P&ID and 3D model data.

This also allows companies to validate the consistency of data that is held within the different systems and there is specific functionality within **UniversalReporter** to compare, contrast and highlight inconsistencies.

What has changed?

The data cache generated by the ReportAdapters can be saved and archived at any point in time. These represent snap shots of the data as it was on that date. If this is performed regularly, then the opportunity of generating a comparison report between two specific dates becomes possible. This enables the ability to audit the engineering content from a progress/change management perspective.

Common reporting interface for all applications:

UniversalReporter provides a simple, single environment to generate ad-hoc reports and templates irrespective of which application is being reported on. Report setup is identical, whether you are reporting on a 3D model, a P&I diagram or an electrical system. The interface is intuitive and easy to use, requiring very little training.

Easy template generation:

UniversalReporter fully utilises Microsoft Excel for the generation of report templates. The system will even generate an unformatted template based on the content you require for the report into an Excel spreadsheet. Once this is done, all that remains is to format the columns and rows using standard Excel functions which are familiar to most engineering staff to achieve the desired look, feel and layout. Any templates that are created can be saved for re-use.

Even complex report templates with multi-lines or multi-pages can be generated quickly and easily using this approach meaning that any ad-hoc report can be generated in minutes without the need for a report writing specialist to be involved.

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Powerful query builder:

The Report- and EditAdapters present data to the **UniversalReporter** in a much simpler structure than it is held within the native application.

Queries can be built up using CAXperts' patented "drag-and-drop" query technology, which completely removes the need for writing complex SQL queries to generate the reports you require. This not only speeds up the report creation process but also puts it in the grasp of most engineering users.

View related documents:

Sometimes, it can be advantageous to actually review the drawings related to the queries and reports being built or generated. For example, you may want to see the piping isometric or P&ID that relates to a valve that is included on a report. **UniversalReporter** automatically allows access to any related P&I diagrams and isometric drawings and these can be launched and viewed directly from the report grid.

Data quality:

UniversalReporter comes complete with an in-built quality assurance check to highlight any inconsistencies with off page connectors (OPC) on the P&I diagrams.

Additionally, there is a **QualityAssuranceModule** that allows users to check the quality of the data against specific naming conventions or design rules. This can be configured to report and enforce corporate and project data management standards.

Benefits:

UniversalReporter provides the following benefits:

- Fast and simple creation of complex reports
- Comparisons of data differences between two dates is possible
- Composite reports across multiple applications can be generated
- Validation of data consistency across multiple applications is possible
- Report templates can be created without detailed knowledge of the application data structure and without the need for extensive SQL writing experience
- A single user interface and approach to report generation for most engineering applications
- Ad-hoc reports can be generated quickly to suit project demands without delay
- Data consistency can be validated
- Man-hour saving on data editing using the EditAdapters

Next steps:

If you believe that **UniversalReporter** may be of value to your organisation, please contact your nearest CAXperts office for further information. We will be happy to provide more detailed information and discuss your individual requirements in more depth.

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