



TSM - Time Series Manager



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Energy data management

TSM software was designed to analyse and evaluate time series data for energy markets. The tool can be used by energy supplying enterprises in various fields. The HAKOM Framework provides an extensive function library for managing time series and additional functionality for specific tasks.

TSM administrates the following data in multiple increments, units and levels of aggregation:

- Meter data
- Load profiles
- Meteorological data
- Calendar information
- Consumption forecasts
- Price information
- Conversion factors

Data management performance

TSM supports various high-performance relational databases and was developed using the latest Microsoft tools. TSM provides a powerful database for processing huge volumes of data extremely fast. To exploit all possibilities for runtime optimization, parallel processing is used.



Fig.1: Parallel processing for data access

Standard user interface

TSM integrates the user interface in Excel as an Add-In and thus offers the full functionality for spread sheet administration.

Graphical display of the time series

TSM has a graphical display of the selected time series in the main window that comes with a zoom function.

Furthermore a state of the art visual exploration of data according to the latest findings in the field of Visual Computing is possible in an own module.



Fig. 2: Status display of time series



Fig. 3: Pairwise correlation analysis of time series

Reporting

With the help of the built-in template concept reports can be created in MS Excel very fast and simple. There is also a „Life Reporting” function available, which enables the positioning of time series data at any point of the reports for individual evaluations.

Import and export capabilities

TSM offers simplified import and export facilities of selected master data of the time series to MS Excel, whereby mass data processing of master data is supported. In addition, the time series can be easily imported in CSV format for further processing, results can later be re-exported. Recurring processes and settings for data exchange can be saved in import/export configurations.

Formula Editor

With the formula editor, calculated time series can be created and edited. They can be calculated by standard arithmetic and logical functions using time series as parameters. It is also possible to supply specific user-defined functions.



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Fig. 4: Enter formulas using the formula editor

Plug In concept

TSM is completely based on .Net technology. This allows the individual development of plug-ins for special applications such as the creation of special load profiles or the access of data from third-party systems.

User rights management

TSM comes with a flexible user rights management to control access rights.

Process automation

TSM provides an API (Application Programming Interface) which allows inserting the entire TSM functionality into automated processes. The main functions of the HAKOM Framework for processing time series can also be automated by using its own API (Application Programming Interface) for individual requirements. These APIs can be accessed from .Net, Powershell and via WebServices. In addition, the TSM API is also available as COM component in the Windows script host, as well as in VBA (Visual Basic for Applications).

Integration platform

TSM offers direct access to time series of other surrounding systems from different business areas with various technologies.

Bi-directional:

- Database procedures
- TSM Plugins via API or Web Services

Read-only:

- Database views

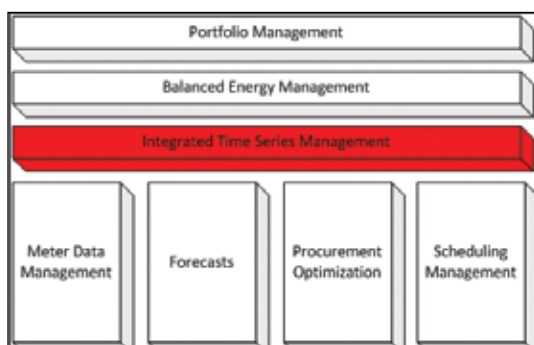


Fig. 5: Integrated time series management

Experienced producer

HAKOM has gained long-term practical experience in the field of energy data management. Since the liberalisation of the energy market in 2001 TSM and the HAKOM Framework is in productive use at a number of renowned European energy supplying enterprises.

Integration in standard systems of other producers

The HAKOM Framework is part of the current version of the BoFIT solution platform of ProCom GmbH from Aachen, the leading European manufacturer of optimization software.



We maintain an intensive partnership with Robotron Austria GmbH, a joint Austrian subsidiary with Robotron GmbH in Dresden, market leader in the field of EDM in Germany and of Switzerland. TSM is available integrated in the **robotron*~~e~~count** product line via a special connector.



The enTrader suite of Trayport Contigo Ltd. from Birmingham innovatively supports companies from the energy sector in the procurement process, trading and risk management. The TSM connector allows an easy integration of the trading system to forward and downstream systems and the integrated representation of time series-based information from the ETRM system in TSM.



The Virtimo AG from Berlin is focused on realizing complex, process based energy applications. Delivering products for market communication, nomination management and their Publication Framework Virtimo offers best in class solutions for all upcoming requirements. The service-oriented integration of TSM expands the portfolio of Virtimo in the areas of time series management and analysis.

