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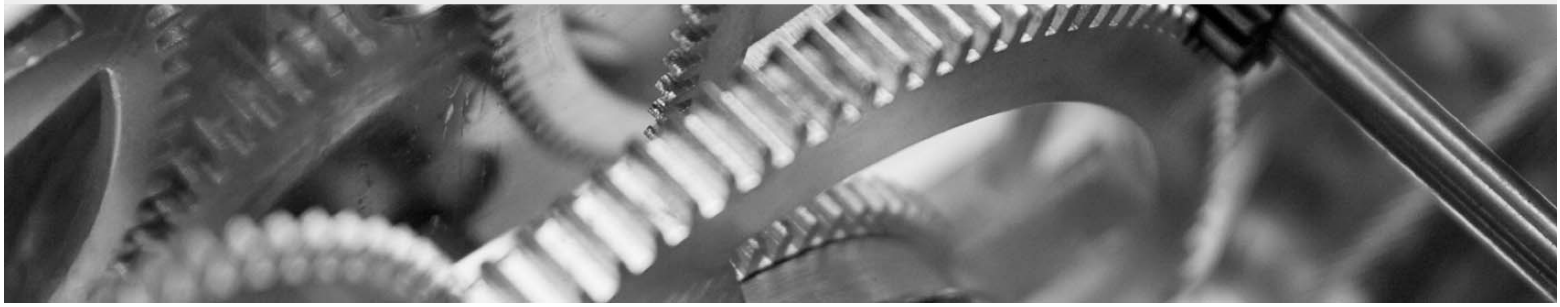

ASSERT
Whitepaper

SIGNIFIKANT

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Content

About this document

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1 Introduction to Assert

1.1 This document

This document describes the functionality, capabilities, central concepts and structures of Assert. Intended readers are IT-professionals, after-sales support experts and evaluators of IT-support for after-sales organisations. Concepts described exist in all editions of Assert, Small Business Edition, Standard Edition and Enterprise Edition though not all editions contain all functions.

1.2 About Assert

For complex products, manufacturing and construction machinery and transport vehicles it is crucial is to be able to deliver service of top quality. This puts high demands on maintenance, diagnosis as well as correct, complete and easily accessible product information which can be expensive and difficult to produce in an effective manner with high quality.

Signifikant offers IT-solutions and IT-services to increase the quality and efficiency when producing, quality assuring and distributing product information. For us it is crucial that our solution contributes to increase sales within aftermarket of our customer's products.

Our product Assert provides correct, complete and accessible information about product structures and product information, spare parts, e-shopping, diagnosis, service information and feedback. Assert, which is used to produce and distribute information is also a data warehouse for all aftermarket information and can be integrated with your ERP system, PDM system and other systems.

One core feature of Assert is the ability to integrate all after-sales information in to one central data warehouse by importing or exchanging information with PDM-system, business systems, document handling systems and other sources of after-market information. This integrated information is then refined, structured and further developed using Assert editing tools by providing additional text, documents and images targeted towards the after-market. In the Assert editing tools, the information structure is improved to enhance the navigation possibilities. The refined information is published to the users, which may access the after-market information through Assert Viewer over the internet, on a CD or as pdf-files.

- Increased aftermarket sales! With higher customer satisfaction and a guarantee of getting the right part easily and quickly, aftermarket sales may grow faster than the corresponding product sales.
- Increase the accuracy and efficiency when working with aftermarket information. The same individual can produce much more information, often new type of information or deeper information that gives increased support to the service organization.
- Direct access to all aftermarket information, regardless if the information has its origin in a PDM system, ERP system or any other system.
- The information is cleaned in Assert giving high quality information, which reduces the risk of expensive mistakes.
- Increased services efficiency. A strong tool for the service organization increases the efficiency through faster access to correct information and more complete information about the product.
- Feedback. Through feedback from the services and market organization correct conclusions can be drawn to continuously improve the products.

2 Capabilities and concepts

1.3 Major features

Assert is a standard PLM system for structuring, producing and distributing after market information as spare parts, technical documentation and other after market information. It is also a platform for your after market, with multiple components.

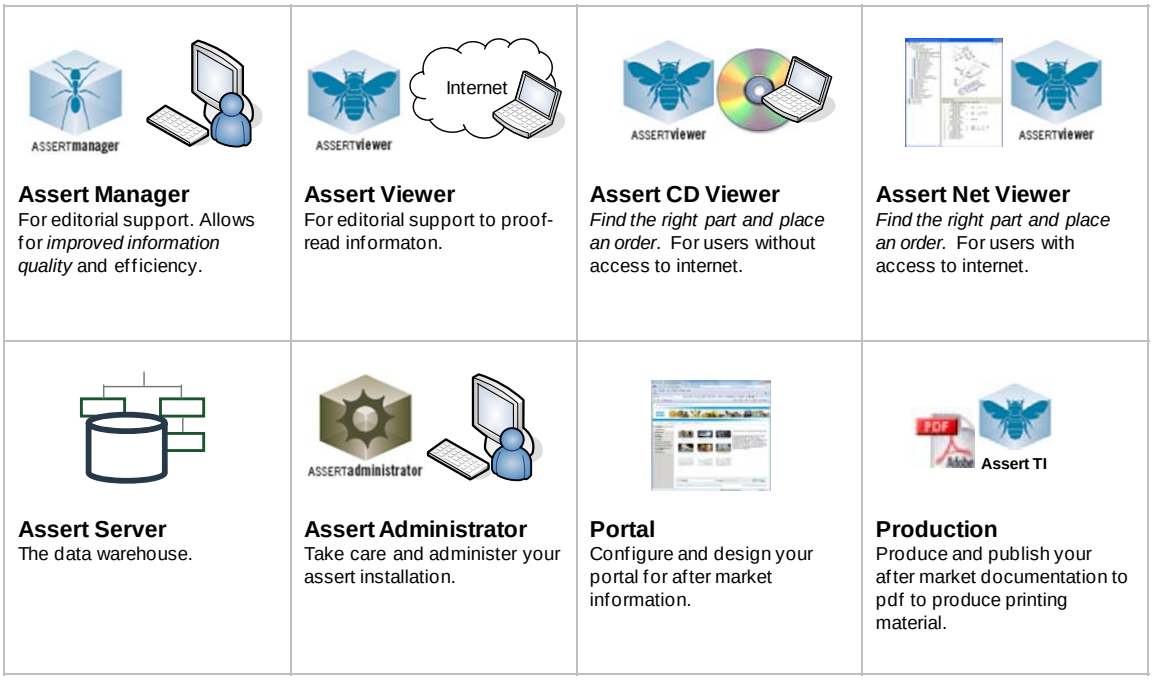


Fig. Assert system components

1.3.1 Data warehouse for product and aftersales information

In Assert, information is largely stored in a central data warehouse. This data warehouse enables collaborative team-work in a distributed organisation. It also enables a unified structure of all information. In order to provide live updates of non-structure information, as pricing information, Assert also enables direct access to base systems as to your business system.

Information is collected from the base systems as ERP, PDM and document handling systems etc. The method of collecting information varies depending on the needs and priorities of the organisation and internal policies and requirements. If information is not refined, restructured or altered in Assert, fully automated processes of integrating information (replication) may be used. If the information is altered or new information is added to improve quality, readability or similar, information is copied. Commonly, both strategies are used depending on the needs of the customers, capabilities of existing systems and other factors.

With all after-sales market information available in one data warehouse, new capabilities and business opportunities are created. It is possible to have a complete overview of all after-sales information, quality control is made much easier, lead-times are greatly improved. Signifikant's experience is also that new, previously not identified business opportunities are created, as pre-maintenance. Naturally, the data-warehouse has support for all kinds of complex queries.

1.3.2 Assert Manager - Editorial environment

Assert is based on an editorial environment, where aftermarket information and spare part catalogue is organized and produced. The editorial environment may integrate with other systems to fetch parts information, images, documentation and other information. It may also be used as a standalone solution.

The editorial environment supports work groups with an automated check in/out function and is similar to a normal windows application. The graphical interface is tuned for ease of use, efficiency and information quality.

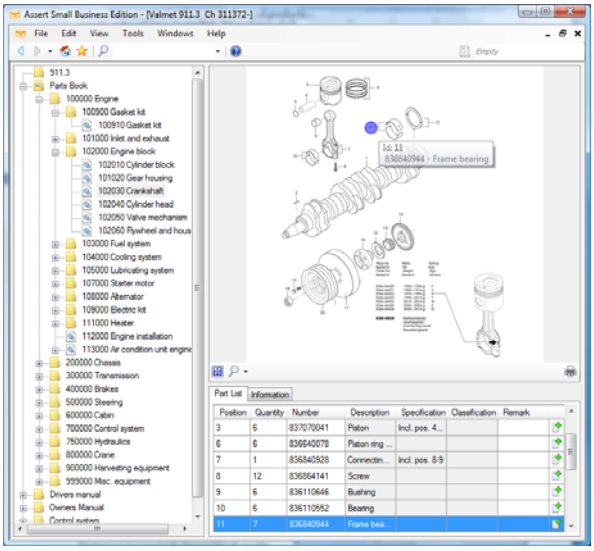
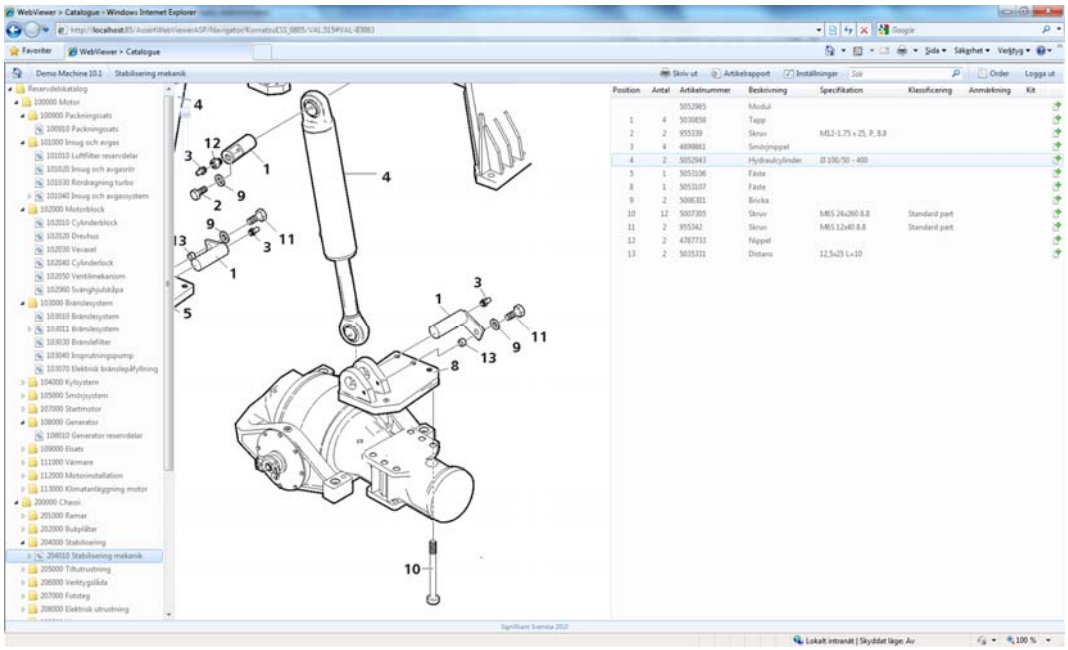


Fig. Spare parts in Komatsu's ESS system.

1.3.3 Spare-parts catalogue

The spare-parts catalogue is the most central information collection in Assert. The data is collected from your ERP or PDM-system or other system. All spare-parts information is possible to refine when integrated to Assert data warehouse, and additional information may be created. Spare parts are accessible for end users through a spare parts catalogue, which contains all necessary functionality for an interactive catalogue, including information structure and spare-parts.

To fully benefit the advantages of a spare parts catalogue, an e-shop solution is needed. In Assert, a spare parts ordering module for e-commerce, based on formatted e-mail, is included. Assert may also be configured to integrate with your existing e-commerce solution, or provided with a third part e- commerce solution.



1.3.4 Service instructions, bulletins, manuals and other information

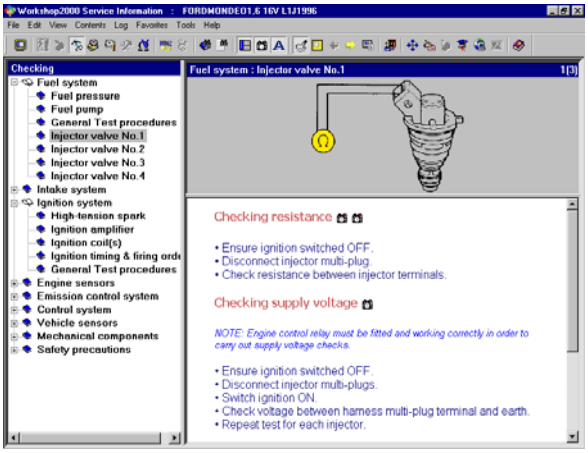


Fig. Service instruction in Workshop master.

As with spare parts, Assert will handle multiple types of information in your organisation, improve the production of the information, and make this information available to your service organisation, marketing and end users. Assert is, apart from spare parts, designed to handle standard times, marketing packages with spare parts and standard times combined, and all kinds of documents as service instructions, bulletins, user manuals and marketing material.

"Workshop master is a PC-based system designed to be a complete integrated support for service information, diagnosis, work cards and interactive training for independent workshops. The service information module provides unique support for production and distribution of all information vital and central for efficient service in the workshop."

Per-Henrik Persson, CEO, InfoCar AB (www.infocar.se)

1.3.5 Multi brand

Commonly, many manufacturers have partners, subsidies, sales agents and other organisations marketing products using a different brand at specific markets. Handling of the same products using different brands is handled in Assert. The different organisations may implement their own version of Assert and exchange information with other installations or chare the same data warehouse. When exchanging information, original information and article numbers are handled to resolve conflicts in numbering and information transparently.

1.3.6 Languages

Translation costs may be very high for manufacturers marketing products in various regions over the world. As the product documentation for each product increases and more products require maintenance, the translation costs increases.

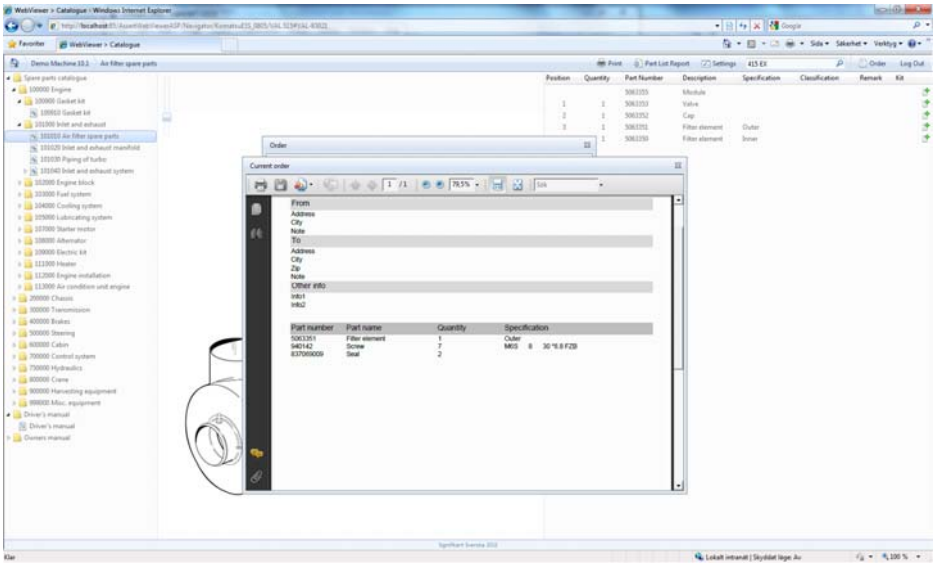
Assert has a powerful support for multiple languages. When an editor writes a language-independent text in Assert, Assert will suggest existing translated text. If an editor need to add new text, that has previously not been translated, Assert will keep track of this text and make it available for translation by preparing a translation material. The result from translation may be imported directly to Assert. The result is greatly reduced translation costs.

"The ESS-system is both stable and efficient. Since the system was introduced, we have managed to cut the costs of distributing product information for our forest machines as well as and improved the quality. Now, our customers always receive the exact right information promptly. ESS is a world-class system!"

Lars Örtengren, Product Manager, Komatsu Forest AB

1.3.7 Order

An order module is built in into the Assert Viewers. The order function may integrate with back end solutions as ERP, information hubs, send order by e-mail or generate pdf:s for printing. If integrated with ERP or information hubs, the order module may present availability and other relevant parts and order information.



1.4 Information structure

The most central part of our solution is a central data warehouse containing all after-sales information and documentation. The information is structured based on an information model, where all after-sales information is classified according to two concepts; *structure* and *information type*. The *structure* enables superior navigation within the information, while the *information type* classifies all information to make the information appear at logical places within the structure. A very important consequence of this data warehouse is automatic cross-checking and washing of all information, greatly improving the quality of all information handled. Inconsistencies in spare part lists and other information are minimized. *Filtering* provides means to find the exact information valid for a specific product based on configuration, chassis number or equivalent.

1.4.1 Structure

In Assert, structure is the navigation structure used to navigate through the product information. The structure used need to be well designed and experienced as natural to all users of the product information, from mechanical engineers to end users. The structure should also apply to all of information types, and navigation and searching should be based on the same principles regardless of information type.

Traditionally, a basic structure in two levels is used; model structure and functional groups. The model structure in this traditional approach is based on the manufacturer's model program. The functional structure is based on the product's different components. There are several standards for this structure as PLCS and J2008 for vehicles. Completely different structures may be used for navigating through user functions and sub-systems.

Assert handles multiple structures for the same information.

1.4.2 Information

The structure is only used to navigate or search for the actual information. The information is classified according to different information types. Information types always have a meaning to all users. Some examples of different information types are:

- Spare parts
- Service manuals
- Service bulletins
- User manuals
- Electrical schemes
- Hydraulic schemes
- Standard times
- Interactive education
- Marketing information
- And more...

The relationship between structure and information is; if a user navigates through the structure to a component (or function), he will have access to all information about this component. A user looking at a cylinder head for a product will have immediate access to all a spare parts available, service instructions, electrical schemes, and all other information without having to research or re-navigate.

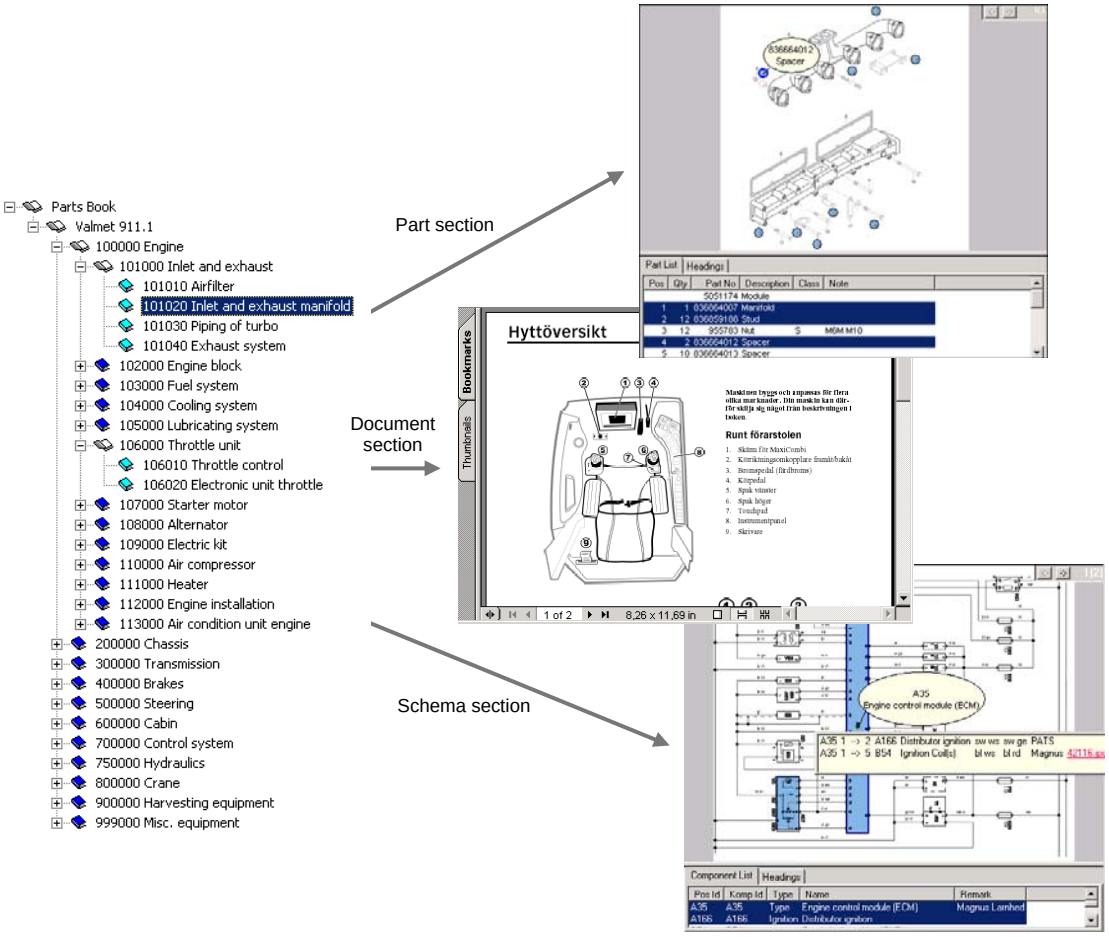


Fig. Different type of information is available in the same structure enabling easy navigation as in this example from Scania Multi.

1.4.3 Machine cards, product individuals and filtering

Filtering is a tool to further improve navigation in the information. A filter may be applied to a specific product individual. With this filter applied, only information valid for this product individual will be visible in the navigation. The product individual may be entered using any pre-defined unique id as chassis number, registration number or product number. Two methods of filtering may be used; machine card filtering and BOM-filtering.

Machine card filtering is the most powerful filtering method. In this method, each product individual has a digital machine card in Assert, containing descriptions and identifiers for all product components. All information may be tagged using these product component identifiers. The method also handles complex logical conditions based on these product component identifiers, as if a product has eight wheels, and a large engine, a specific transmission is used.

In BOM-filtering (bill of material), the product individual is specified by a list of valid information, and no product components need to be tagged. BOM-filtering may be used in combination with machine card filtering.

Product individual filtering may be based on the above methods or on creating a separate product structure for each produced individual.

3 Functionality

Assert has a strong core to create flexible structures that makes it easy for the user to orient to the correct information. To the structure different data, presentations can be linked. The information and the system are built on the same principles with a modular way of thinking that easily allows extension of the system. Starting with a small implementation of Assert, as Small Business Edition, it is easy to add on more functionality as needs increase.

Workshop solution

Assert is designed to be a workgroup solution, supporting teams working distributed in a large organisation.

Publishing

Publishing of information is possible to different types of media such as the internet, web-server, DVD and pdf.

Language

The system easily handles translations.

Multi brand

Assert can handle multi brands. In an organization with many brands one can exchange information among the companies. The articles are valid for the brand name and the article numbers does not need to be different.

Data integration

The editor can easily exchange information through an import / export function. The exported data is complete with the translated information, illustrations, etc. Easy integration based on XML or transformation to PLCS.

Handling of illustrations

Assert can handle images and videos in various formats. Images have hot-spot functionality, e.g. click on a spare part in an image and the spare part number and description will be shown.

Handling of references

In Assert one can create references to information and thereby easily link related information to each other. E.g. a hotspot in an image can be linked to a part that describes the article.

Notes / Book marks

The end user can create own notes that can be saved. Navigation to the bookmark is easy next time the user logs in to the system again.

History

The user's navigation in the system can be saved, hence, making it easier next time the user wants to find the same information.

WYSIWYG

Assert edit application shows directly the information that the end user is going to see

Security

Assert data is protected with the same safety mechanisms as for Windows NT.

Order

A simple order application allows the end user to make an order that can be sent by e-mail or printed.

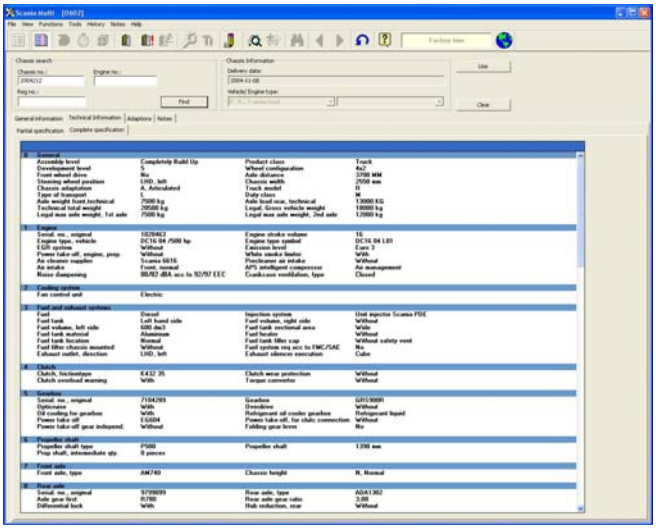


Fig. Machine card as used in Scania Multi.

1.5 Functionality – continued

Filtration of aspects

When having a lot of data it is of interest to view only parts of the data. Data may be filtered based on individual vehicle, data type or e.g. engine type.

Access control

In Assert, access control is used to control so that some user-groups only see selected parts of the information in the system. Users, user groups and roles can be given access rights to only limited functionality and information in the system, e.g. read only information.

Filtration on individual

Filtration is used when one only would like to see information that is relevant to a single individual example a specific truck. The result will be that the user only sees the information that is relevant to the specific individual. The rest of the information is hidden.

Asian language support

Support of unicoded languages.

1.6 Assert product information types

To Assert, one can connect different types of information, presentation and applications.

1.6.1 Integrated information

Assert supports multiple types of information, all available at the same location for the end user. Such information may be spare parts, different types of documents, market packages, service bulletins or interactive training.

1.6.2 Spare parts and part modules

A spare-part module consists of a list with articles and with one or more illustrations. The positions in an illustration and one article in the list can be related. If one click on an article in the list a position on the illustration will light up.

1.6.3 Documents

With a tool in Assert one can add most kinds of documents and store it in the system for easy access to the user. These documents may be used as service instructions, drivers manuals, service and operation manuals etc.

1.6.4 Schedules

A schedule (e.g. an electrical schedule) in Assert consists of an illustration. The user can easily navigate in schedules and see additional information regarding the different relations between various components in the schedule.

1.6.5 Standard times

This application handles working tasks and the time it takes to do specific tasks.

1.6.6 Package

A package is a number of standard times and spare parts. Experience gives that some combinations of spare parts are common and those have been put into a package. Example of a package would be the articles that are used to change the brakes on a truck and the time this takes. The price for doing certain jobs can easily be given to the customer.

1.6.7 Campaigns and offers

Certain types of documents has a certain validity time, an offer for example, the system will make sure that a certain document can only be read during its validity time.

1.6.8 On-demand training

The system also has an application with information on how certain spare parts should be changed and how to identify an error. One example would be how to change the brakes on a truck.

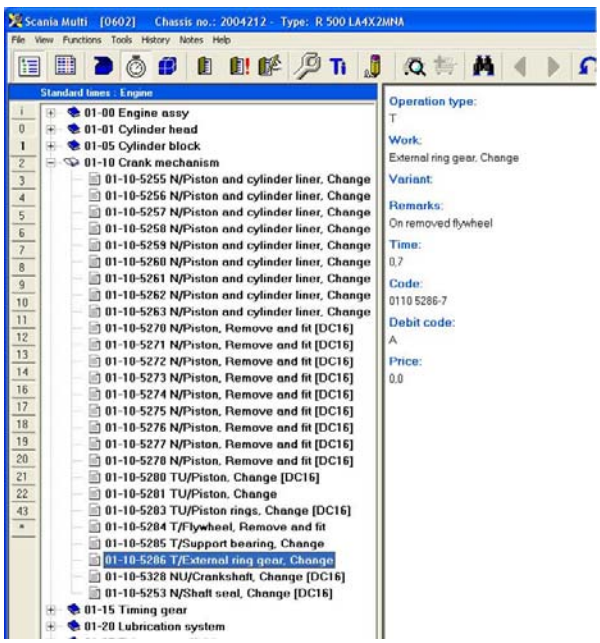


Fig. Standard-times in Scania Multi

4 Technology

The core of Assert is an information server providing a set of services and a data warehouse. The information server is based on Microsoft Windows Server technology, IIS and Microsoft .NET framework. The database is a Microsoft SQL Server. Data is stored using the SQL-database, external files for parts of your existing information and XML. Data integration is based on XML.

The architecture is designed with modern technologies as WebServices, XML and SOAP and according to the principles in service oriented architectures. Our design-philosophies are usability, flexibility, reliability and total cost of ownership.

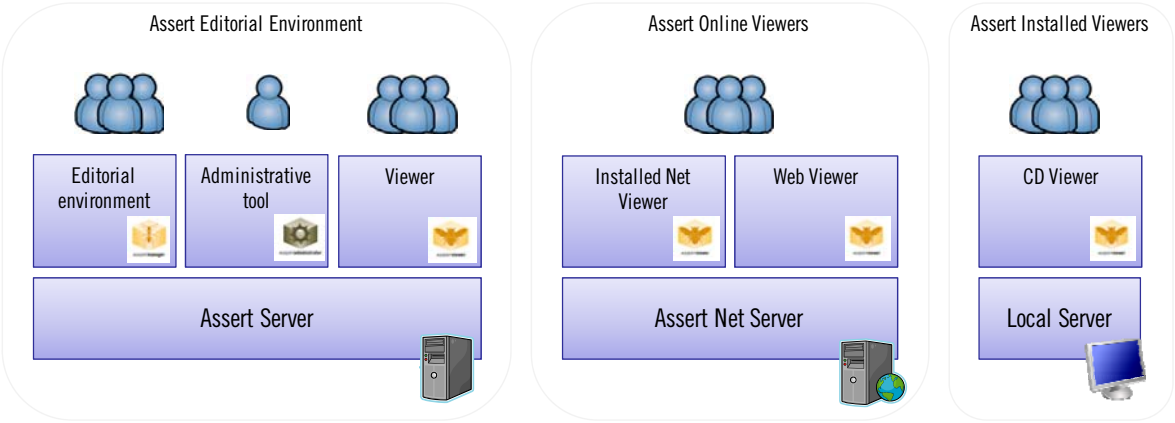


Fig. Major systems components.

The data warehouse is integrated with your base systems as business support system, MPS, PDM and information other systems. The Assert data warehouse and server may work directly towards the base systems or replicate base system data. For all information needing to be refined or restructured, replication is advisable. The Assert Editor is used to structure and complement the integrated and replicated information. The data warehouse is an MS SQL Server database and the Assert server is a Windows Server with server software running .NET framework. Communication with the Assert Editor is based on Web Services.

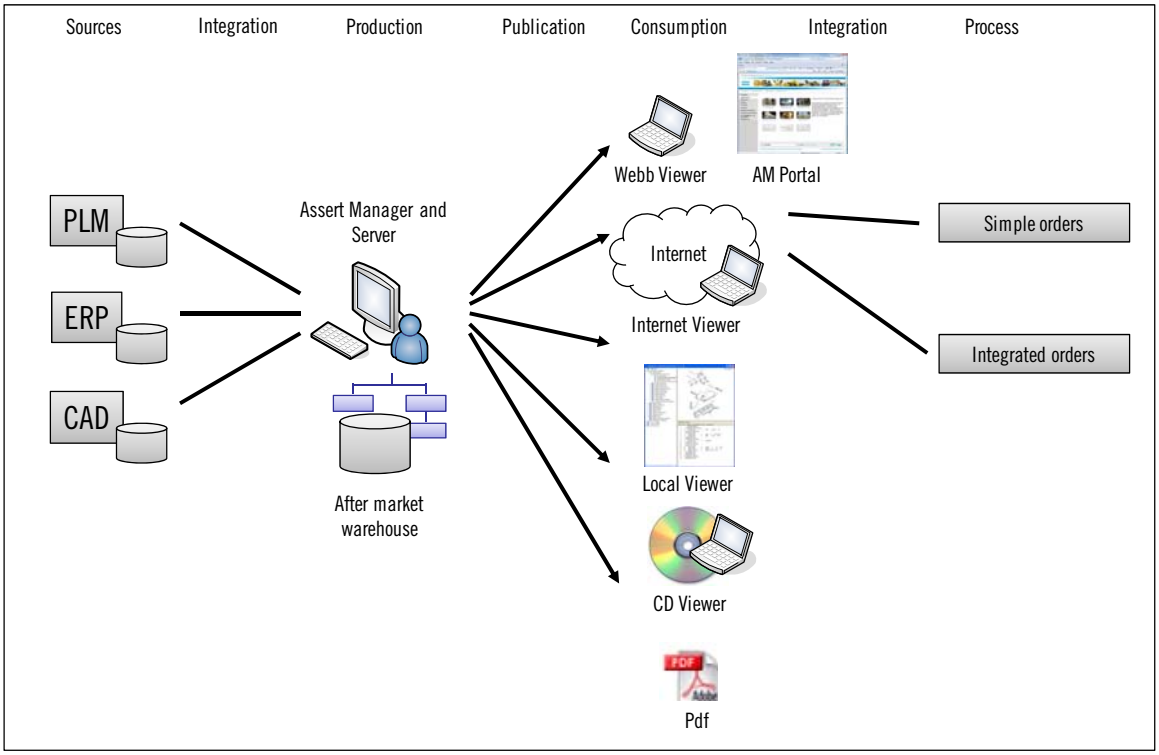


Fig. Process.

Information is made available to the end users by publishing the information to the publications database. For publications available over the internet, a web-enabled version of the Assert Viewer is used. The publications data is stored in a MS SQL Server database and the information available through an MS IIS web-server. For publications to be distributed on CD, Assert provides a stand-alone Assert Viewer.

5 Implementation

Smooth and efficient implementation of Assert in an organisation is essential to a successful usage. Signifikant has the competence and experience to plan and lead such a project without adventuring your daily business or existing information. Signifikant plans all implementations based on our Signifikant Implementation Model, Simple, with:

- Focus on the customer's business and needs!
- Taking care of the customer's experiences and existing information.
- With a pre-study to understand how Assert may be used to achieve most value for the investment in terms of efficiency and quality.
- Implement and configure Assert in defined iterations, where each iteration is evaluated.
- Start simple, be flexible!

Implementation time may vary from a two weeks up to some months depending on the amount of customization, the size of the organization, the number of systems to integrate with and the amount of data to migrate. Commonly, a first vanilla-version, may be in place within a month from project start.

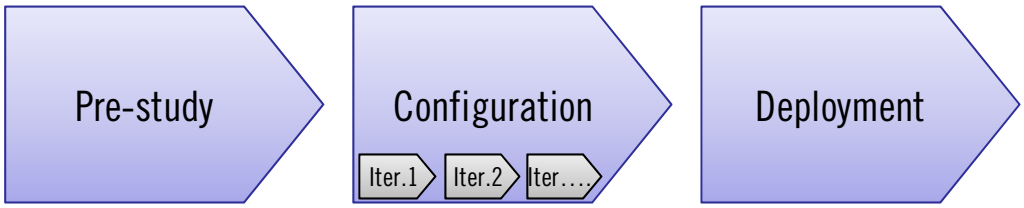


Fig. The three phases of the Simple model for an implementation project. Any phase may be divided into several phases, but normally the configuration phase is the one being planned and carried into several iterations.

1.7 Pre-study

The pre-study-phase is used to understand the exact needs of the customer's business and the ambitions of the Assert-project – your expectations and visions – and how Assert may be configured, changed or further developed to meet these expectations. The result of the pre-study is a plan for configuration, changes and development until final deployment. It is a master project plan for all further work for Signifikant and for the customer. Central is to identify project risks and handle or plan for to handle these risks. Finally, all costs are estimated.

Only if the most central aspects contributing to efficiency and quality are identified, Assert (or any similar solution) will meet the expectations.

- Identify business goals
- Select configuration
- Identify need of changes
- Try to batch-import data if needed and plan for integrations
- Risk management
- Planning and cost estimation

1.8 Configuration, changes and development

Since not all organisations are the same and best practices in business processes do differ from manufacturer to manufacturer, Assert need to be configured, changed and further developed to suit the exact needs and requirements. Assert is designed to be modular and easy to both configure and change and additional functionality may be needed. The configuration phase is used to make these changes, and to integrate Assert with your existing systems. In this, data migration and data integration is also included.

- Configuration of functionality
- Implementation of specific functionality and integrations
- Testing and quality assurance
- Data migration
- Risk management
- Begin training of super-users

1.9 Deployment

The deployment is releasing Assert in the customer organisation. The deployment is carried out in several steps, starting with limited user tests. Central is to train super-users, and to minimize all technical and organisational risks.

- User training
- Final technical testing
- Release

Continued maintenance!

Signifikant does not consider a project completed at the end of an implementation, but instead we consider it started. An efficient support and continued maintenance of your Assert implementation is your insurance of your investment in an after-sales solution!

6 Signifikant

Signifikant is an IT-company specializing in system development and system administer that strives to make our customer's business processes more efficient with help of IT-systems.

We are specializes in IT solutions and services and business development for the manufacturing industry. Through many years of industrial knowledge and experience of delivering solutions to industrial companies, we can help to improve our customers work within spare parts handling, product documentation, service and maintenance. To give our customers great additional value from our services we work with ready made solutions. We also have experience to do pre-studies, project manage and off-shore development of IT-solutions.

Signifikant's experiences in IT-solutions and services for manufacturing and dates back to 1995. Our customers have previously been large manufacturers of commercial vehicles. Since 2004, our business is carried out as Signifikant, and we offer local IT-consultancy, off-shore development, and solutions for the after market of manufacturing industry.

"Signifikant's vision is to improve the efficiency of our customer's business processes in product- and business information through efficient IT-solutions and services. We differ from our competitors by simply better understanding our customers business and needs!"

For more information, please contact

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