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# ARIS Design Platform Getting Started with BPM



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British Library Cataloguing in Publication Data A catalogue record for this book is available from the British Library

Library of Congress Control Number: 2007923594 ISBN-10: 1-84628-612-3 e-ISBN-10: 1-84628-613-1 ISBN-13: 978-1-84628-612-4 e-ISBN-13: 978-1-84628-613-1

Printed on acid-free paper

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Springer Science+Business Media springer.com

# DEDICATION

For Sally and Serena

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## Acknowledgements

It is thanks to a great many people that we have been able to write this book.

Rob would like to thank all his colleagues at BT, many of whose ideas have contributed to the store of knowledge he has built up and which has enabled him to write this book. Also thanks to the staff at IDS Scheer in Germany and the UK who have provided much help and assistance.

Eric would like to thank his colleagues at IDS Scheer who supported him with their knowledge of ARIS best practice and ideas about what should be included in a book about the ARIS Design Platform. He also thanks Karl Wagner who gave him the freedom to spend some time in writing this book and to Sinje Seidler and the ARIS product marketing team for their feedback and reviews. A very special thank you goes to Eric's wife Serena and his children Noah and Simon for their understanding and tolerance while he worked on the book.

We would like thank Springer-Verlag for the opportunity to publish the book. In particular Beverley Ford for her enthusiasm for another ARIS book; to Catherine Brett for all her help and support, and to Frank Ganz for his assistance on the book layout.

We would also like to thank IDS Sheer AG for permission to reproduce screen shots of the ARIS Platform and to use figures and text from ARIS promotional and technical documentation.

> Rob Davis Eric Bräbender

## Foreword

At the end of the 1980s, Professor August-Wilhelm Scheer developed ARIS as a meta-model for organisational modelling and to provide a procedural model for recording, analysis and optimisation of business processes and their implementation in software systems. In 1993, IDS Scheer released ARIS Toolset; the first version of the ARIS modelling software based upon the ARIS methodology.

Today, the ARIS Platform is confirmed by the Gartner Group (2001) and Forrester Research (2006) as the worldwide market leader in business process modelling and BPM software. The Platform consists of more than 20 different products covering the whole BPM lifecycle from business process strategy, to process design and through process implementation to process controlling. The ARIS products and the ARIS method are also delivered through strong partnerships with companies such as SAP or Oracle. This success shows that IDS Scheer is always aligned to the wishes and requirements of our customers and partners.

While ARIS Toolset still exists, and the ARIS methodology remains one of the pillars of successful Business Process Management, IDS Scheer offers two new version 7 products: ARIS Business Architect and ARIS Business Designer. These new products strengthen the product portfolio by providing platform independent web-enabled modelling clients based on new, but proven, technologies (e.g. Java) and which offer many new features to help customers to implement more efficient BPM. By working closely with our customers, and with well-known usability labs all over the world, our new products were completely re-designed to be more user friendly and easier to use.

Following on the success of Rob Davis' first book about ARIS Toolset, it was a must for Rob Davis and Eric Brabänder to produce this new book on ARIS Business Designer and ARIS Business Architect. Rob's expertise in ARIS is of great help in introducing the new products to both new and existing customers.

This book focuses on helping people beginning BPM with ARIS Business Designer, but also offers ARIS experts insight into the new features of ARIS Business Architect. With their practical examples, and step-by-step description of the new ARIS products, the authors enable users to get the best from the products by explaining new features in a clear and simple way. They also show how use of ARIS fits into a BPM project and the BPM organisation.

This book is a must-have guide and reference for new and existing users of ARIS Business Designer and Business Architect. The book can be used as a companion for ARIS training and as a reference for experienced users.

I wish all readers the same pleasure I had reading this practical guide to the ARIS Design Platform.

# Chapter 1 An Introduction to BPM

In this chapter we give a brief overview of the history of Business Process Management; we discuss what business processes are and why we have to manage them. We look at the lifecycle of BPM and its four phases.

### 1.1 Brief History of Business Process Management

#### 1.1.1 The Need for Business Value

When people first started living together in social groups, a few entrepreneurial people found opportunities to trade goods and services to others in the group. In later times this grew into the formal business structures and monetary systems we are familiar with today. Businesses are formed to earn profit and grow the personal wealth of their owners. This means the main objective of the owners and employees of a business is the generation of a financial return in exchange for their input. This input is mostly in the form of time, resources, and money.

Every kind of business provides products or services to their customers with the objective to generate revenue and to add value to the customer at the end of the 'value-chain'. This value can be created in different ways depending on the kind of business. For instance, the added value created by a retailer for outdoor equipment is the optimal delivery of quality products for their targeted customers, while the added value of a car manufacturer consists in producing different types and models of cars to meet the needs and wishes of their customers. With everincreasing competition for different markets, resources, jobs and skills; only businesses that can deliver value to all their different stakeholders, in an efficient and cost-effective way, will survive.

#### 1.1.2 The Production Line

In 1910, Henry Ford is reputed to have said the well-known words:

#### "A customer can have a car any colour he wants so long as it is black."

This clearly shows the target market for which he was positioning his new and highly innovative product: 'the car'. The market was at an early stage and the competition between manufacturers was mainly driven by delivery and price. The customers were not given the opportunity to express their individual customer requirements; even the colour was fixed. Ford concentrated on achieving the highest efficiency in terms of time and cost by the use of a 'production line' or 'assembly line' continually repeating the same, optimum, sequence of tasks. Using this procedure to decompose a large piece of work into small measurable and optimised tasks, Ford dramatically reduced the cost of manufacturing.

Similar ideas also came from Frederick Winslow Taylor, whose 'Taylorism', or 'Scientific Management', continues to influence us today. Taylor developed five principles of Scientific Management:

- 1. Scientifically study each part of a task and develop the "One best way" of performing it,
- 2. Select the best person to do the job,
- 3. Train, teach and develop the worker,
- 4. Provide financial incentives for workers who follow the methods,
- 5. Divide work and responsibility so managers are responsible for planning the work methods and workers are responsible for executing the work accordingly.

The sequencing of tasks and allocation of the right people and resources to produce the end result is what today we call a '*process*'.

#### 1.1.3 The Process is Your Business

Almost everything we do in business is driven by processes. They may be the very rigid processes of high-volume production-lines or the more flexible officeprocesses for the definition and sale of insurance or credit. The idea of analysing and optimising processes was transferred from manufacturing industry to other sectors such as the finance and service industries. Processes may also be the ad-hoc processes we operate in our everyday lives. Everything that operates in a company or organisation, creating value by offering products or services, is controlled by the processes. Processes are the veins or the nerves of a company.

#### "Processes are not just something your business does; processes are your business."

Managing those processes means focusing on the important activities and resources of a company, such as: markets, strategy, people, financial aspects, material management, intellectual properties, data and information, legal and many other areas.

#### 1.1.4 Business Process Re-engineering

In the late 1980s and early 1990s, many traditional businesses started to go through a period of dramatic change brought about by the opening of global markets and the removal of many legal and traditional barriers to trading. Many businesses had to change the way they operated and to think about their business processes. This situation led to the rise of '*Business Process Re-engineering*' (BPR) as a concept for optimising the efficiency and effectiveness of a business by documenting, analysing and changing the business processes. The common theme was to re-engineer a business and the underlying processes. Hence it was necessary to understand the existing '*as-is*' processes.

One of the well-known innovators of the BPR idea was Michael Hammer. In a discussion about the definition of a process he gave a good 'rule of thumb':

#### "If it doesn't make three people angry, it isn't a process."

Of course, this quote is provocative, but it underlines the basic idea of Business Process Management (BPM): not to focus on a department-oriented view, but on the most efficient way to bring all resources together in an end-to-end crossdepartmental process that adds value to the customer.

Once a model of the 'as-is' business process is available, various analytical methods can be used to check if the process delivers the product or service in the most optimal and cost-effective way. In particular, each task can be analysed to ensure it 'adds value' to the business as opposed to being a bureaucratic operation wasting time and money.

As we have already seen, even before the 1990s, many businesses had realised that automating parts or even all of their business processes could save cost and time. In the manufacturing industry this meant the introduction of automated production lines and robots. In the service industry, or in the service areas of a manufacturing company, it means the use of computer systems and electronic data interchange.

By this time many businesses had been through BPR, 'down-sizing', 'rightsizing' and many other trendy techniques prevalent at that time. The lucky ones came out the other side 'leaner and fitter', but many had gone through drastic change for little benefit. The main reason for this was businesses were frequently being optimised against the wrong metrics and often only individual, isolated, aspects of the process were taken into account. For instance, drives to reduce call-handling times in customer call centres often neglected to take into account customer satisfaction measures or the increased rework costs due to failure to resolve customer complaints properly on the first call.

Many businesses realised it was necessary to take a much more holistic approach to quality and business metrics. This was the beginning of the development of integrated management systems like '*Total Quality Management*' and '*The Balanced Scorecard*'. These approaches offered more than just re-engineering a process based on efficiency metrics. They offered a holistic and organisation-wide view of '*Key Performance Indicators*' (KPIs) and their influence on process change. Furthermore these approaches delivered reference structures and reference models for organisation-wide process architectures.

The ARIS Method and ARIS Software Platform offers support for such a holistic approach to Business Process Management allowing every aspect of a process to be analysed and optimised.

#### 1.1.5 The Growth of IT

The rapid growth in the use of computers and electronic data interchange not only transformed traditional manufacturing and services industries, but also gave rise to a completely new sector of information-based businesses. As a result, computer systems, and the data held within them, became central to the operation of most businesses. No longer was it sufficient to model and re-engineer business processes by considering systems and data just as a resource; the status of systems and data was now on a par with process. Thus BPR now encompassed process model-ling, data modelling and systems analysis.

Aligning with this trend there was the rise of new and innovative IT technologies providing IT Systems support to all areas of the organisation. More and more the idea grew of integrating the IT applications tightly together and having all the business-relevant information of the company in one central '*Enterprise Resource Planning*' (ERP) system. The key question was how to bring businessrelated functions (e.g. sales, material management, capacity management, procurement, production planning, etc.) together with technical functions (e.g. product design, construction, transportation, logistics, etc.). To answer this question, in the early 1990s, Professor August-Wilhelm Scheer developed the Y-CIM reference model for manufacturing industries (Fig. 1.1). This model was the basic idea for the later development of the '*ARIS Method*' and the ARIS Software Platform.

The necessity to describe a process and all its related data, systems and information was the starting point for developing a model-based language to describe and analyse all the information needed to describe the integrated business processes.

#### 1.1.6 Today's Process Challenges

Today we face similar challenges. In the 1990s, integrated application systems like SAP R/3, Oracle, Baan etc. offered numerous already integrated, pre-defined and standardised business processes for all the important areas of a company (e.g. sales, management, financial accounting, etc.). But, by the end of the 1990s, there were new trends and topics focusing on cross-company business processes such as '*Supply-Chain Management*' (SCM) or '*Customer-Relationship Management*' (CRM). Customers or other partners in the supply-chain were now the focus of the business.

As a consequence of this trend, the software vendors developed new types of CRM and SCM applications. However, for these 'best-of-breed' solutions to work within the end-to-end business process, they needed access to the same company-wide, or cross-company, data and information. To integrate these different application systems, 'Enterprise Application Integration' (EAI) systems were used to avoid redundant data being input into the different systems. At the user-side, portal-systems were used to integrate the different back-end systems and to give a single access-point to the business user.



# Order Product

#### Fig. 1.1 Y-CIM Model

Today, organisations face many challenges. Besides price and cost pressures, businesses are becoming global and new markets such as China are developing rapidly. Furthermore, there is rapid technological development and product lifecycles are shortening. It is no longer enough to define customers by market segment; there is increasing expectation that products will be configured for individual customer needs. On top of all these trends there are country-specific or industryspecific regulations and compliance issues to which companies must respond (e.g. Sarbanes-Oxley, FDA, Solvency II, etc.).

All these challenges are forcing companies to react to new requirements and changes using flexible business processes. The software vendors are aware of this and starting to offer new concepts and technologies to support business process flexibility. SAP is now offering a Business Process Platform based on new concepts such as 'Service-Oriented Architecture' (SOA). Oracle, Microsoft, IBM and other vendors are also supporting their IT-offerings with SOA. At this point SOA is just a technology to support flexibility in business process implementation, but increasingly BPM and SOA are becoming inextricably linked.

So Business Process Management is being driven to closer and closer integration with IT (Fig. 1.2). In addition, organisations are changing their structure to be



Fig. 1.2 The Development of Business and IT

more process-oriented, more flexible and more agile and this is being supported by IT-technologies which themselves have more flexibility and better alignment with the business.

## 1.2 Realising Business Process Management

Today everybody talks about Business Process Management (BPM), but often they have different ideas in mind. We therefore need a common understanding of what Business Process Management means and we need to work out the ideal way to set up BPM in an organisation. First we need an easy, but workable definition of a business process:

**Business Process** – the definition of the tasks, and the sequence of those tasks, necessary to deliver a business objective.

Based on our definition of a business process we see it is not easy to analyse business processes, to define them and to install them because a lot of business information is needed to understand the process. Furthermore, if businesses and business strategies are changing, the underlying business processes also have to be changed and adopted. So let us have a look at the basic concepts of BPM and the key factors necessary to consider when implementing BPM within an organisation.

> **Business Process Management** – a systematic approach to managing and improving an organisation's business by the active, coordinated management of all aspects of the specification, design, implementation, operation, measurement, analysis and optimisation of business processes in order to effectively and efficiently deliver business objectives.

This is rather a mouthful, but in short BPM seeks to make business processes more effective and more efficient in a way that is more capable of adapting to an ever-changing business environment.

This means all activities performed by businesses to optimise and adapt their processes are a part of BPM. To fulfil this requirement of adapting business processes to an ever-changing environment, BPM itself is structured like a continuous improvement lifecycle. This is the basic difference between BPM as a holistic approach and the analysis of business processes as an isolated initiative or as part of an ERP-implementation or a BPR project. BPM is not done in a project. BPM itself is a process which has to be implemented and executed inside an organisation. It has to ensure its own processes support the flexibility and changes required in the organisation.

The BPM lifecycle consists of four major phases (Fig. 1.3):

- Business Process Strategy,
- Business Process Design,
- Business Process Implementation,
- Business Process Controlling.

#### 1.2.1 Business Process Strategy Phase

Only those organisations that define and regularly modify targets can work towards them and be successful in the marketplace. The core business processes enable organisational solutions to optimally support the strategy, or as Alfred D. Chandler once put it: "*Structure follows strategy*". Therefore, the Business Process Strategy Phase forms the foundation for aligning business processes to the general corporate strategy.

Depending on the market environment, organisations adjust their strategies, often in very short time periods. These changes in strategy need to be reflected in the business processes. Thus, with every strategy change, a company must pay careful attention to the underlying business process strategy and the changes of business processes. There are various management approaches for establishing strategy management, for instance the Balanced Scorecard (BSC) approach.



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Fig. 1.3 The BPM Lifecycle

Key success factors in introducing a strategic management tool are the commitment of top management and the involvement of employees through an appropriate communications strategy. Knowledge of the company's strategy and business objectives is essential to align this with the appropriate business processes.

So, if you are defining a business strategy you will implement this strategy by changing your business; for instance, by addressing new target groups, positioning new and innovative products or by changing sales channels. Every change in your business to realise a new strategy will also have an impact on your business processes.

For example, when a PC manufacturer decides to change their sales strategy from being a normal supplier in the value-chain to direct sales via the Internet, it is clear this will have a tremendous impact on the business processes in the sales area. Furthermore, if the manufacturer decides to offer customers the option to individually configure their own hardware during the Internet ordering process, it will have a significant impact on many processes from the sales order process through the whole production process and to the suppliers in the value-chain.

This example shows how corporate strategy and its realisation in the organisation is driven through changes to the business processes. So, every time a strategy is defined, there is normally a direct impact on the operational processes. The definition of corporate strategy and objectives is, in most cases, coupled with the re-engineering of existing legacy processes. The defined strategic objectives and goals are reviewed by weighting appropriate key performance indicators related to the business processes and comparing them with the desired objective.

#### 1.2.2 Business Process Design Phase

The major goal of the Business Process Design Phase is the alignment of a company's processes to the needs and requirements of the market, including the design, analysis and optimisation of the processes as part of a continuous improvement loop. The function of the design phase is to provide transparency of the current as-is process-flow and to ensure the efficiency and quality of the processes. This requires a method-based approach and a unified, structured and understandable description language.

The design phase answers the questions: "Who does what, in what sequence, what services or products are produced and what software systems and data are used to support the process?" As part of the process analysis, organisational, structural, and technological weak points in the processes are revealed and improvement potential is identified. This can be done just by visualising a business process, but it is also possible to simulate processes to find out more detail about bottlenecks, costs and resource-problems. The results of the analysis, combined with corporate goals, are used to derive and to define target or 'to-be' processes (i.e. processes that – when implemented in IT – will help the company to create better value in the future).

The first step into professional BPM involves the related areas of design, analysis, and optimisation. Design consists of recording the actual status of existing 'as-is' processes. Processes can only be visible and subject to detailed analysis after consolidation of all the knowledge about them. This knowledge exists primarily in the minds of the employees who are in charge of, or involved in the operation of, the processes.

The analysis phase provides detailed information about the structure and efficiency of business processes. Cost centre and resource utilisation levels as well as process bottlenecks caused by media breaks and breakdowns in the underlying IT systems become evident. Evaluation and reporting (i.e. process cost analysis, what-if analyses or process simulation), provide organisations with important process indicators.

The process design phase not only includes design, analysis and optimisation of business processes; it also comprises the analysis and optimisation of other views (e.g. IT landscape, organisational structures, etc.) and the publishing and communication of the designed processes and company information. Only if all relevant process information is published to all people involved in the process can the feedback-loop be closed. The feedback from these people about the quality of the modelled processes, and ideas on how to optimise these processes, is the first step in a continuous change and optimisation process centred on the process owners and process operators.

#### 1.2.3 Business Process Implementation Phase

BPM does not end with the modelling and improvement of business processes on paper (or in ARIS software). The information technology to support, implement and improve company processes is assuming ever greater importance. More and more, IT departments are taking on the role of business process innovators through the implementation of evolving IT technology. IT must be flexible enough to cope with the rapid pace of change in the corporate environment, and powerful enough to meet the demands of changing business processes in the future.

The Business Process Implementation Phase focuses on the seamless mapping of business processes and business requirements into operating application software with minimum information loss. An organisation must first focus on the business processes to be implemented and, only then, on the actual implementation and IT systems. Because most process improvements cannot take place without IT support, the value IT brings to a company is the optimisation of corporate processes by providing transparency of execution times and costs.

Organisations today are struggling with numerous IT systems and technologies. Introducing new or modifying legacy IT solutions is very costly because, in many cases, there is no uniform description of the business processes to be supported by those systems or technologies. The implementation of business processes through underlying IT systems can be achieved in three basic ways:

- Implementation of standardised ERP-systems,
- Service-Oriented Architecture,
- Classical software engineering and individual software development.

#### Implementation of Standardised ERP-Systems

The implementation, update, or harmonisation of business management application systems, such as SAP or ORACLE, provides an opportunity to optimise existing structures and processes within the company in the context of a business process optimisation project, thus reducing costs. Implementing ERP-systems also allows standardisation of processes throughout the organisation and the re-use of well-tried best-practice for dedicated industries.

Ultimately, IT systems must be adapted to the company's strategy and business logic – not vice versa. Current integrated process and application architectures make this procedure significantly easier. Nevertheless, the most important task in any implementation project is selecting the alternative business processes relevant to achieving corporate goals from those offered by the ERP-system and adapting them to the individual needs of the company.

#### Setup of a Service-Oriented Architecture

A Service-Oriented Architecture (SOA) is a software architecture that defines the use of loosely coupled software services (software components for defined business functions) to support the needs of the business. In an SOA environment, services are made available as independent services that can technically be accessed without knowledge of their underlying platform implementation.

By setting up an SOA, business processes dictate the business requirements to be met by the services, not the other way round. Hence, an effective BPM must be the basis for a successful implementation of an SOA. This 'service focus' enables new, and above all more flexible, ways of implementing business processes at the IT level.

#### Classical Software Engineering and Individual Software Development

Despite the broad range of ERP systems and integration software available today there is still an enormous demand for customised solutions because standard software is expensive or not perceived to be flexible enough.

In some cases, the software is not available at the right time or is unsuitable for particular industry sectors. While standardised application software is often used in manufacturing industries, banking and insurance industries have their own business processes supported by in-house developed legacy IT systems.

Business-driven software engineering enables the development of customised software which maps to the business logic for all business processes and supports their execution. It is always important to communicate requirements and technological solution approaches in a manner comprehensible to project participants, to organise development projects efficiently, and to ensure custom systems can be adapted to satisfy future requirements.

In this part of the Business Process Implementation Phase, the highest value is derived by a deep integration of business process design information and software development information. There is a lot of interest in '*Model-Driven Architecture*' (MDA) approaches where the IT-logic and source-code is generated directly from process models related to the implementation technology.

#### 1.2.4 Business Process Controlling Phase

"If you can't measure it, you can't manage it." Almost everybody studying business or economics has heard this advice from Peter Drucker. Even if you have never heard it before, you can appreciate the logic of his statement. The Business Process Controlling Phase enables qualitative and quantitative measures to be compared against targets, thus revealing areas with potential for improvement and greater productivity.

The Business Process Controlling Phase involves measurement of the efficiency of the business processes implemented with help of the IT systems and the implementation of internal control systems to monitor compliance with a wide range of regulations. The basic target of process controlling is to ensure the implemented business processes are running as they were defined during the design phase and all process control steps are in place and working.

Furthermore, process efficiency is measured and analysed against targets defined for the Key Performance Indicators (KPIs) to identify opportunities to make changes to close the BPM optimisation loop. This improvement potential can be analysed on the basis of actual data, such as throughput times, return frequencies, and deadline reliability.

Complete control of operational processes allows companies to install proactive BPM. Strategic corporate goals are monitored by installing a process performance management system which continuously monitors each 'as-is' process instance against a set of 'to-be' targets. This can provide prompt warnings of deviations from planned figures and allow the implementation of appropriate countermeasures. Continuous monitoring of actual business processes bridges the gap between corporate strategy and its operational implementation. In this chapter we give an overview over the ARIS Platform and the ARIS products. The structure of the book is described with advice for different reader groups.

## 2.1 Business Process Management with ARIS

In the first chapter we discussed the meaning and evolution of Business Process Management. We described the phases of the BPM lifecycle that represent a procedural model for real-life business process management and help to handle all BPM related tasks. The '*ARIS Platform for Business Process Excellence*' from IDS Scheer (Fig. 2.1) provides all the necessary tools to manage these BPM tasks and the related corporate information.

The ARIS products are aligned to the BPM lifecycle and offered in an integrated software solution grouped into four ARIS Platforms:

- Strategy Platform,
- Design Platform,
- Implementation Platform,
- Controlling Platform.

The system architecture of the ARIS Platform allows globally distributed organisations to set up common scenarios for designing, analysing, and optimising processes, IT, and software architectures.

Web-based products such as *ARIS Business Optimizer*, *ARIS Business Architect*, *ARIS Business Designer*, and *ARIS UML Designer* can access a centrally managed *ARIS Business Server* from anywhere in the world via a three-tier architecture. These products are designed for use beyond firewall limits utilising low bandwidth connections (e.g. dial-up, ISDN, etc.). Web-based clients can be started directly from within a Web browser or, alternatively, they can be installed as a desktop application manually or by automated software distribution. In both cases, any necessary client updates can be set up and controlled centrally to facilitate the rollout process.

A central database server (e.g. Oracle) is used for data management. All ARIS clients access the database server via the *ARIS Business Server* and thus work with a common database.

The ARIS Platform offers a high level of system scalability and availability. For instance, the majority of modellers can use *ARIS Business Designer*, while a smaller number of expert users can provide central administrative functions (e.g. management of access privileges, available reports, conventions/filters, etc.) using *ARIS Business Architect*.



Fig. 2.1 ARIS Platform - Major Products

The Windows-based client products of the ARIS Platform, *ARIS Toolset* and *ARIS Easy Design*, can operate in parallel via the Local Area Network (LAN) on the central *ARIS Business Server*. As these products require higher bandwidth connections, a terminal server, such as Windows Terminal Server with Citrix MetaFrame, is necessary when the products are used in a Wide Area Network (WAN).

The integrated software solution of the ARIS Platform has two key characteristics:

- Central data repository,
- Common language and semantics.

ARIS is based on a database concept offering a central database for all modelling items (e.g. models, objects, symbols, connections, etc.) and all administration information. Everything described, designed and analysed within the different ARIS products is stored in this central data repository.

All ARIS products have been developed by IDS Scheer without the need to integrate any 'foreign' software not based on the central repository concept. This ensures every new product added to the ARIS Platform is built on the central repository.

Integration also means everything you model and describe using the ARIS Platform products is based on common language and semantics that can be understand