ENTERPRISE INFORMATION SYSTEMS

- System Integration

System Integration

Literature:

- SODOMKA, Petr, Klčová, Hana. *Information systems in entrepreneurial practice*. 2nd edition (segments 42 and 43) 2. Brno: Computer Press, 2010. ISBN 978-80- 251-2878-7. Pages 459 - 474.
- GÁLA, Libor, Jan POUR and Zuzana ŠEDIVÁ. Business informatics. 2nd edition (segments 42 and 43) 2. Prague: Grada, 2009. ISBN 978-80-247-2615-1. Pages 353 - 380.

System Integration

System integration:

Integration in the enterprise economy means an act or process by which we combine, interlink and merge various enterprise IT resources into a higher unit, whereas the components mutually collaborate and share data without any discernible delay and coordinate their functionality in such a combination that seems to be a unified system to the user. Gála 2009.

System Integration

System integration:

Enterprise Application Integration (EAI) is one of the key issues in the implementation of IT projects. Many organisations, especially large branched organisational structures and detached workplaces have in recent years accumulated a variety of information technology solutions. They often use many different hardware devices and a variety of mutually incompatible software applications.

The costs will rise in those organisations where it is necessary to work with a fragmented applications structure, where the business data are not processed in a targeted manner as well as where the system deficiencies are caused by inefficient management of the business processes. Sodomka 2010.

System Integration

System integration:

This is the merging of various software components, subsystems, into a single functional unit. The objective is for this unit to work as most efficiently as possible, i.e. from the viewpoint of the individual subsystems so that communication between them runs according to the defined schemata and any errors and anomalies were included in this schemata.

The basis of system integration is purposely designed infrastructure focused on support of specific processes.

A

with the integration platform. System integration takes care of the interlinking of the individual subsystems. Wikipedia.

System Integration

Reasons for system integration

- Inconsistencies in corporate data
- Higher IT/ICT administration costs
- Fragmented infrastructure
- Difficult manageability of IT projects
- Low efficiency of IT projects
- Mass and unsystematic deployment of computers

System Integration

Evolution stages of IT integration:

- Software integration - early stages when the design of monolithic applications stopped and it was necessary to mutually interlink finished software modules, function and procedure libraries
- Common database - closely related to the development of the database systems, which allow various applications to share a common database
- Packages - onset of type application software where comprehensive solutions are created by interlinking of a series of modules. Individual modules share common data
- Middleware - onset of objects and components, which make it possible to integrate the software developed in various environments - JAVA, C#, Visual Basic, etc. The package thus comprises heterogeneous components and the capability of the specific technologies is used to the maximum.
- Integration of the enterprise applications, which are components of various application packages from various suppliers
- Integration of inter-company applications, which are operated by various organisations, for instance, those involved in the supply chain.

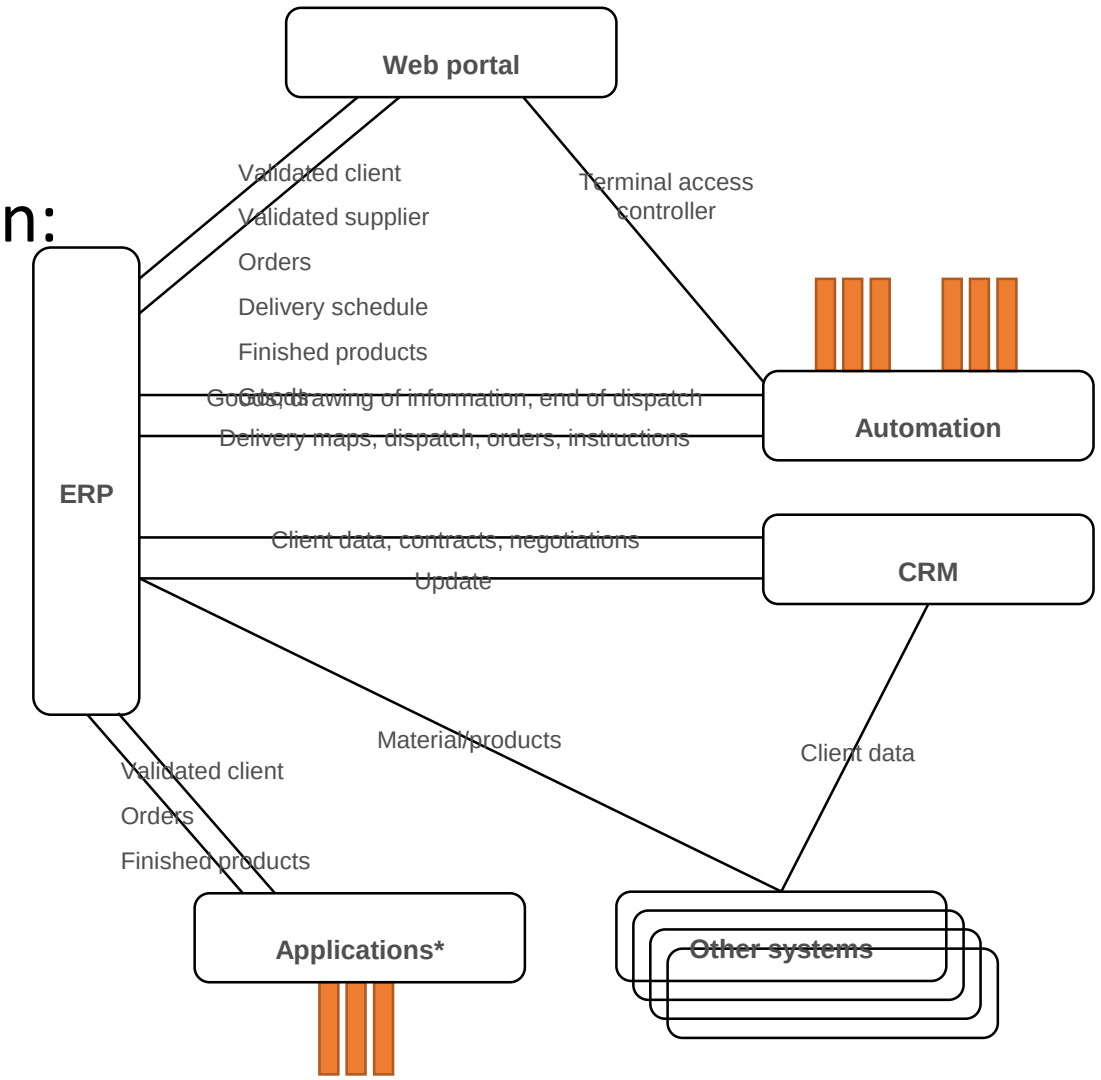
System Integration

Practical examples of integration:

- A graph created in MS Excel, or OpenOffice can be shared in other applications - for instance, in the text editor, web, etc.
- A security system is used at the company’s gatehouse and besides this also a fire system and the events in both systems should be visualised directly on the building plan
- The application that maintains the customer records has the task to verify the existence of this subject in the appropriate registers - ARES.

System Integration

Practical examples of integration:



* applications that register phone orders since individual orders generate several transactions to ERP and CRM must be answered immediately

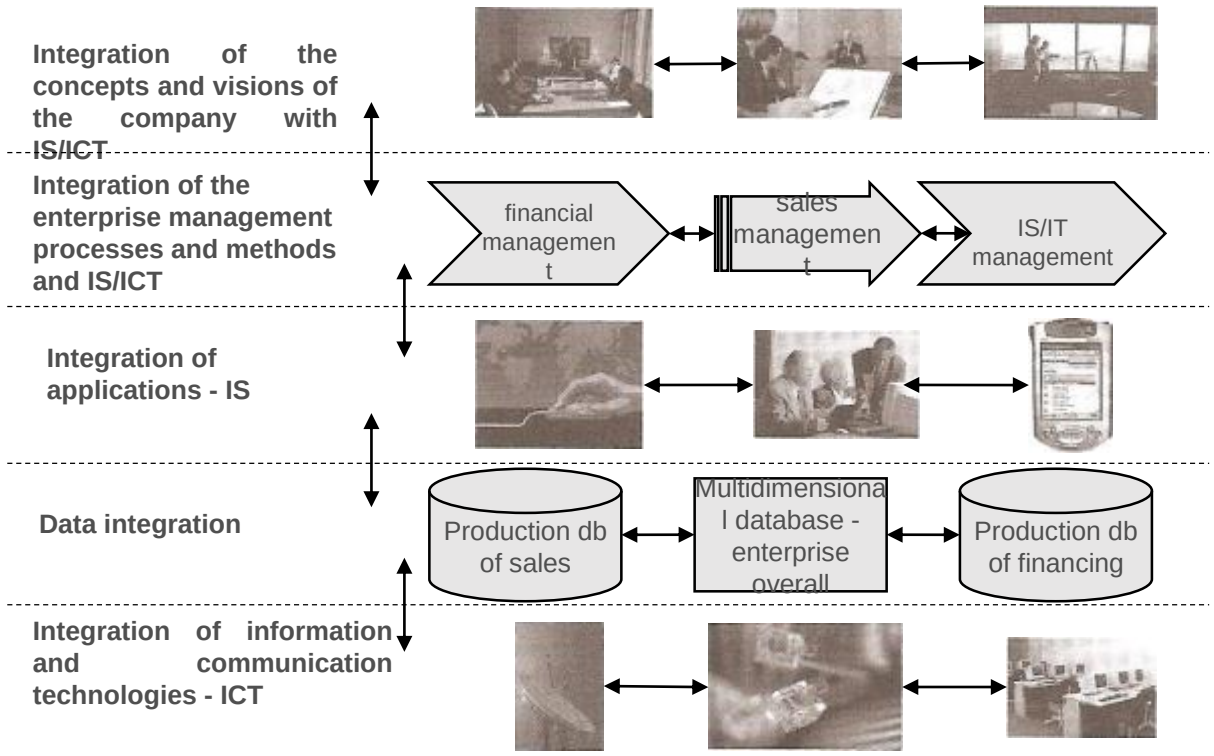
System Integration

Scope of system integration

- Data integration
- Integration of applications
- Integration of business processes
- Graphical User Interface
- Methodical Integration
- Technological Integration (HW, network, etc.)

System Integration

Scope of system integration



Source: Gála, p. 378

System Integration

- **Point to Point Integration -** separate integration of each monolithic application with each other
- **Middleware -** is software that is between the operating system and the applications and offers a versatile set of services that form the operating environment of the system, which allows the processes, software and applications to mutually interact in a distributed system.
  - Communication Middleware - mutual communication of the software regardless of whether they are components of any application
  - Data Management Middleware - enables access of software to data stored in various data resources
  - Platform Middleware - a suitable operating environment with a set of generally applicable services

System Integration

Middleware (basic):

Communication middleware - provides a protocol for transmission of messages or data between the software and the interface through which the software accesses the communication services. It focuses on support for synchronous and asynchronous communication between the software and uses various communication patterns.

Synchronous communication - the calling software waits for a response from the called software

Asynchronous communication - the calling software does not wait, it transfers the request to a specialised system, which guarantees delivery of the request

System Integration

Middleware (basic):

The resources for management of access to the data allow transparent access of the software to the remote databases. They ensure the conversion of the software request to a language that is comprehended by a specific database

RDA - Remote Database Access

RFA - Remote File Access

Examples: ODBC - Open DataBase Connectivity, OLE DB - Microsoft Object Linking and Embedding Database, ADO.NET - Active X Data Object

System Integration

Middleware (basic):

Platform Middleware - Initially provided transaction processing services in a three tier client-server model - for instance, Microsoft Transaction Service.

Resources were subsequently created that provide standardised and recurring services for applications so that the application implements only application logic functionality.

System Integration

Functionality of integration middleware:

Technical adapters - suitable interface between the system components

Securing information - provision of syntactic and semantic conversion of the data, which are transmitted between the applications

Transparent approach to heterogeneous data - creation of a consistent logical view of variegated data

Intelligent routing between applications - to the appropriate recipient

Support of BPM (business process management) - activities related with analysis and definition of the process, its actual execution, monitoring and administration

It allows process management based on the Business Rule Engine (BRE)

Business Event Management (BEM)

System Integration

Service Oriented Architecture

SOA - Service Oriented Architecture

SOA introduces application technologies in which the functional logic of the application is arranged in modules (services) with clear identity, purpose and interfaces accessible to the software. The services behave like “black boxes”. Their inner structure is independent of the type and nature of the environments in which they are used. In service oriented architecture, the data and functions are encapsulated in the modular components with the documented interfaces. This method simplifies the design of the applications and provides the option of their incremental development and future expansion. The integration of applications developed in SOA with various externally acquired applications can be significantly simpler than applies to the monolithic applications.

System Integration

Effects of system integration

- Ease of system operation and administration
- High level of scalability and parametrisation
- Shortening of the enterprise’s total response time to stimuli from the environment
- Integration of corporate know-how
- Reduction of the error rate and inconsistency of information

System Integration

System integrator

- This is a person who is a member of the implementation team, or is independent
- He solves requirements that transcend the possibilities of the informatics team itself
- He has competences that transcend informatics
- He communicates with all company departments
- He co-creates and integrates corporate processes in the IS

System Integration

System integrator functions:

- Collaboration in the information strategy creation process
- Creation of the initial study - specification of products, services, time, finance
- IS/IT architecture design
- Document management
- Testing and evaluation of the quality of components, services and complaints
- Project planning and creation of the schedule and project management
- Consulting and optimisation of business processes
- Securing HW and SW deliveries and installation
- Co-ordination of sub-deliveries
- Guarantee of functionality and quality

System Integration

System integration in the Czech Republic

- www.cssi.cz - Czech Society for Systems Integration - established in 1994
- The society has several professional sections, which are thematically oriented. This concerns:
- Information Systems Research Centre - www.cvis.cz
- Professional Legislative and Legal Team
- Professional Service Oriented Management Team