FUNCTIONAL DEPENDENCY BETWEEN THE LOGISTICS SECURITY SYSTEM AND THE MySAP ERP IN METALLURGY

MySAP ERP - *Enterprise Resource Planning* (system - solution which provides a whole set of functions for the business analytics, finance, human resources management, logistics and corporate services) has developed from SAP R/3. It is one of the main products of the SAP AG German multinational company and as such, it is a very important element of the international industrial and technological security system. By defining the functional dependency between the security systems (logistics security systems) and the IT (My SAP ERP) systems in metallurgy, a concept for designing MY SAP ERP system in metallurgic industry is defined, based on the security aspects.

Keywords: metallurgy, logistics, security system, mySAP ERP

INTRODUCTION

Contemporary information technology systems (MySAP ERP) depend on the financial, economic, political, technical and technological, construction and design, security and many other aspects. The above mentioned systems define a concept-approach to designing and implementing the contemporary IT system (My SAP ERP).

By studying security and metallurgic aspects as separate categories and by isolating the basic elements of the metallurgic industry, security of the data related to the metallurgic industry, systemic and corporate security and many others, we define a whole set of elements which, either directly or indirectly, influence the approach to designing and implementing the contemporary IT system (MySAP ERP).

By determining the contemporary IT system (MySAP ERP) as a current integrated software solution contributing to the increase in the system efficiency and effectiveness, the controlled "need" for the concept of the designing model for MySAP ERP system in the metallurgic industry, based on the security aspects [1].

MySAP ERP

SAP AG is the greatest European software company and the third in the world (after Microsoft and IBM), with its head office located in Walldorf, Germany. SAP AG offers ERP solutions; it has revenue of 9,4 billion dollars a year and employs 39 300 people. SAP AG was established in 1972 by five IBM engineers in Mannheim.

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SAP AG`s set of products includes:
• mySAP Business Suite

It represents a set of adaptable business solutions which enable optimisation of the critical business processes and which are built on the SAP Net Weaver platform, including Customer Relationship Management, Enterprise Resource Planning, Product Lifecycle Management, Supply Chain Management and Supplier Relationship Management.
• SAP xApps

It is a set of applications which are executed in the existing heterogeneous systems by means of their integration into the whole business systems which provide more efficient management.
• SAP Manufacturing

It is a software solution for real-time work and it enables more efficient and quicker adaptation to the market changes.
• SAP NetWeaver

Is a technical basis for mySAP Business Suite and SAPxApps which provides a complete, open and flexible infrastructure and enables smooth integration of SAP and non-SAP applications.

My SAP ERP is a business information system which provides companies with the accurate and detailed account of their business operations. It is possible to include the overall business operation of a company in the system, either its business processes or some parts of them, in other words modules which comprise MySAP ERP system [2].

MySAP ERP system comprises modules presented in Figure 1.

According to their use, modules are divided into:
• SAP finance; logistics; human resources

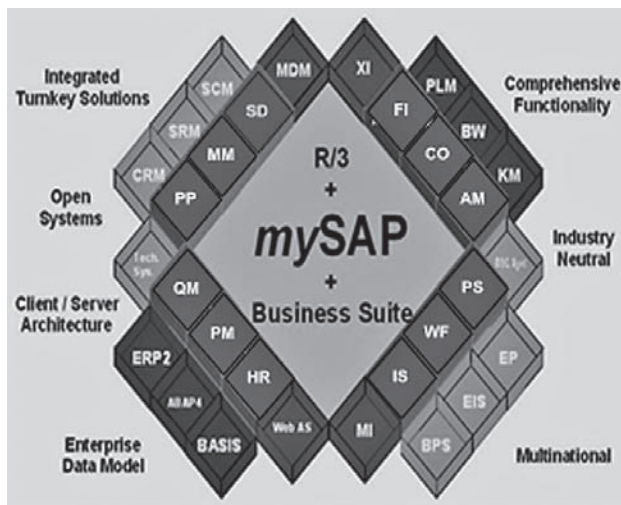Modules of the MySAP ERP system are based on the concept shown in Figure 2.
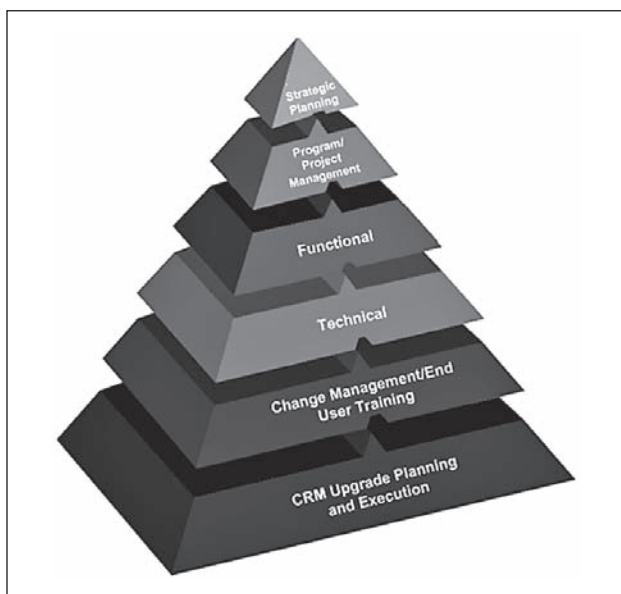
Figure 1 MySAP ERP system model [3]

Figure 2 Concept of the MySAP ERP module [4]

SECURITY SYSTEM MODEL

Security system is a comprehensive set of elements defined by their mutual interaction and the choice of concept. By analysing the macro and micro models of project and industrial security systems in relation to the development of the integrated software solutions, we come to the definition of the basic model of the security system shown in Figure 3.

The basic model of the security system comprises the following basic elements:

- Contextual elements are the first level of the security system and they are conceptually defined by formulating the basic "framework" of the system, its problems and problem-solving approaches.
- Conceptual elements are the second level of the security system and they are conceptually defined by formulating the overall systemic strategy.
- Logic elements are the third level of the security system and they are conceptually defined by formulating the form of the system and its effects.
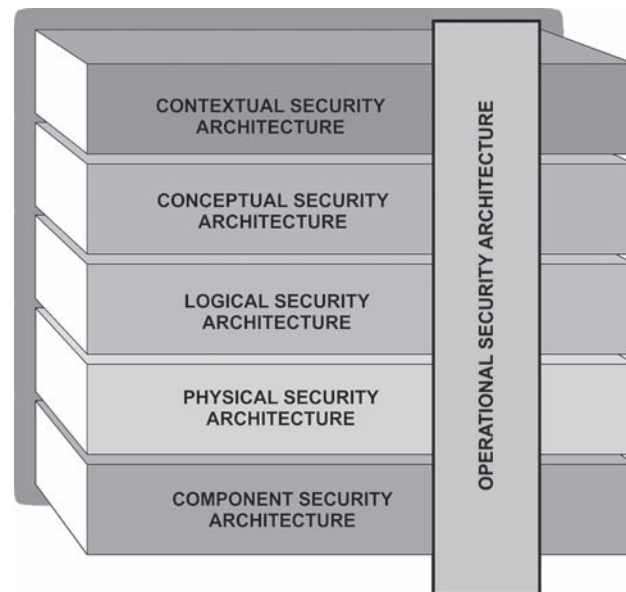

Figure 3 Basic model of the security system [5]

- Physical elements are the fourth level of the security system and they are conceptually defined by formulating the form of the applied resources and system carriers.
- Component elements are the fifth level of the security system and they are conceptually defined by formulating the consistency in the original form of resources and system carriers.
- Operational elements are the sixth level of the security system and they are conceptually defined by formulating the effects of the system management.

METALLURGY

Term and Division

Metallurgy is a science (branch of industry) of metals and procedures for obtaining and processing the metal and its compounds from ore, salt and waste material and it is defined by the general model with its basic features shown in Figure 4. Metallurgy includes refining, alloy production, shaping, metal finishing and study of the structure, composition and the features of metals [6].

Metallurgy can be categorised in many different ways. Depending on the technological process, it can be sub-divided into:

- pyrometallurgy (melting at high temperature),
- hydrometallurgy (extraction of metal from raw material using aqueous solutions),
- electrometallurgy (electrometallurgic ore processing),
- electrothermal (ferrous metals) and
- electrochemical (non-ferrous metals).

The most common division of metallurgy is the division into:

- Ferrous and
- Non-ferrous metallurgy.

Ferrous metallurgy includes obtaining pig iron and steel, their purification, production of ferroalloys and alloyed steel and the corresponding semi-products while non-ferrous metallurgy includes the production and purification of all the other (non-iron) metals and corresponding semi-products.

TERM AND DIVISION	METALS AND ALLOYS	PROCESSING AND REFINING PROCEDURES

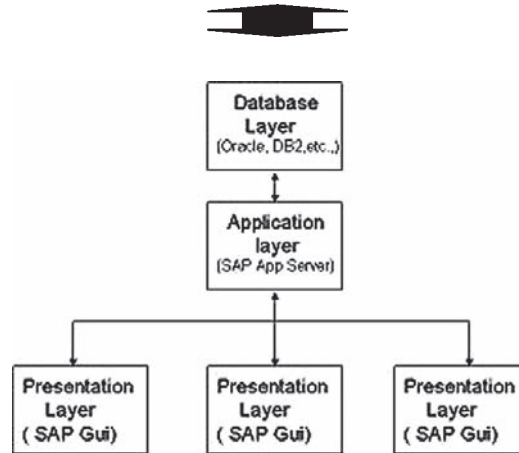**Figure 4** General model of metallurgic features

Figure 5 Basic architecture model for MySAP ERP

Matrix	Property (What?)	Motivation (Why?)	Processes (How?)	People (Who?)	Location (Where?)	Time (When?)
Contextual elements	activity	risk model	process model	organization	system positioning	time positioning
Conceptual elements	characteristics	aim	strategy	model of an entity	domain model	deadline
Logic elements	information model	policy	services	entity scheme	domain scheme	process cycle
Physical elements	information system	procedures	mechanisms	entity interface	domain platform	time structuredness
Component elements	information structure	standards	tools	identity	position	time
Operational elements	management	risk management	strategic management	human resources management	operational management	time management

Figure 6 Matrix of the basic security system model elements

Figure 7 Model concept for the design of the MySAP ERP system in metallurgic industry based on security aspects

Metals and alloys

Metals represent a very significant group of materials used for the production of wide range of products. In this process, some specific features of metals which depend on the structure of their atoms and their interrelations (crystal lattice) become more apparent.

An alloy is a mixture of two or more elements, at least one of which is a metal.

In metallurgy, metals are most commonly processed by casting and plastic deformation. Other procedures of processing and refining are frequently applied in various branches of metal processing industry.

- Metal casting

Casting is a process of shaping in which melted metal material is poured into metal ("moulds") or sand casts. After it is cooled and solidified, the metal cast permanently retains the shape of the mould cavity.

In this manner, we can relatively easily and economically obtain very complex geometric shapes which do not have to be additionally processed or just need a finishing touch.

- Metal processing by plastic deformation

Plastic deformation can be used in processing of all metals and alloys. The procedures can be carried out at standard or high temperature (cold and hot procedures).

The most significant plastic deformation processing procedures are: metalsmithing, pressing, rolling, and extraction.

- Thermal metal processing procedures

The aim of thermal treatment is to maintain the structure of metal existing at high temperature in the cooled down metal as well. Thus we obtain a better quality product.

The most common thermal processing procedures include: annealing, hardening and relaxation [7].

DESIGNING THE MySAP ERP SYSTEM

The main architecture of the MySAP ERP system is based on the integrated concept of levels shown in Figure 5 [8].

- Presentation layer is the interface of MySAP ERP.

- Application layer is a level at which the set user interface actions are implemented in accordance with the original (programmed) code.

- Database layer is a central MySAP ERP database which provides logistical support.

The security aspect, as a key concept for the MySAP ERP system in metallurgy, is determined by matrix elements of the basic security system model shown in Figure 6.

By defining the essentials of the MySAP ERP security system in metallurgy, we formulate a model framework for the design of the MySAP ERP system in metallurgic industry based on the security aspects. The concept applied for the implementation of the above mentioned demands the integration of security system model, basic architecture of the MySAP ERP systems and main features of metallurgy Figure 7 [9].

CONCLUSION

Design model for MySAP ERP systems in metallurgic industry based on the security aspects is defined as one of the most elaborate engineering concept based on the definition from the most prominent book "Logistical systems", which states that the synthesis of all human activities is a special logistical sub-system [10].

By establishing the functional dependency between the security system and the MySAP ERP system in metallurgy, the macro-micro problem of designing the integrated MySAP ERP system is formulated.

The model for designing the MySAP ERP systems in metallurgic industry based on security aspects is a unique new logistical concept of the approach to designing the contemporary IT systems.

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