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PROJECT INFORMATION SYSTEM

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Abstract: Information system must provide data, information and adequate information technology for: the running of the business process, management (subsystems and business functions etc.), expertise basics for management decision-making and, main business system management. In business systems three dimensions determine management, namely: executive body management, adaptation and development, which includes business processes as well. Therefore we can distinguish two basic business system application fields: a) information executive body subsystem, b) information subsystem development. Information subsystem development provides all the necessary data and information required for the adaptation projects carried out by managers and personnel as well as for the business system development. These projects are carried out on the business system and subsystem level. Information system project is an information system aimed at fulfilling information demands of the main system project, of the maintaining system project, as well as of the project system management. These projects are the result of strategies carried out within business systems. They are aimed at transforming strategies into projects, which are then carried out by business systems in a determined period of time. The quick transformation of strategies into projects together with the quick and higher quality performance, give rise to an advantage in business system competition.
Key words: business system, information system, information technology, information subsystem development, project information system, project information subsystem, business process, management.

Sažetak: PROJEKTNI INFORMACIJSKI SUSTAV. Informacijski sustav mora osigurati podatke, informacije i odgovarajuću informacijsku tehnologiju za: potrebe izvođenja poslovnih procesa; potrebe menedmenta (podsustava i poslovnih funkcija i sl.); potrebe izrade stručnih osnova za menederske odluke; i potrebe vodećeg menadžmenta poslovnog sustava. U poslovnim sustavima menadžment određujemo kroz tri dimenzije i to: menadžment operative, prilagođavanja i razvoja a time i poslovne procese. U skladu s tim razlikujemo dva osnovna aplikativna područja informacijskog sustava: a) informacijski podsustav operative i b) informacijski podsustav razvoja. Informacijski podsustav razvoja pruža sve neophodne podatke i informacije potrebne izvođačima i menadžerima koji su zaduženi za izvedbu projekata prilagođavanja i razvoja poslovnog sustava. Ti projekti se izvode na nivou poslovnog sustava ili nekog od njegovih podsustava. Projektni informacijski sustav je informacijski sustav za zadovoljavanje informacijskih potreba vođenja glavnog sustava projekta i sustava skrbništva projekta te za potrebe vođenja i izvođenja sustava izvođenje projekta. Projekti su rezultat procesa izvođenja strategija u poslovnim sustavima. Ide se za time da se strategije pretvore u projekte, koje poslovni sustavi u određenom vremenskom periodu izvode. Sa brzom pretvorbom strategija u projekte te njihovim brzim i kvalitetnim izvođenjem postiže se namjena projekta tj. strateška i konkurentna prednost poslovnih sustava.
Ključne riječi: poslovni sustav, informacijski sustav, informacijska tehnologija, informacijski podsustav razvoja, projektni informacijski sustav, projektni informacijski podsustav, poslovni proces, menadžment.

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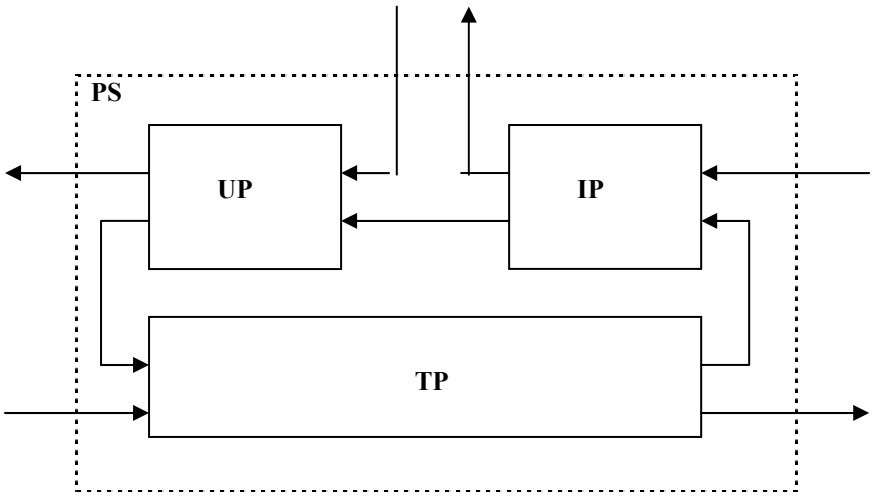
INTRODUCTION

Successful management of business systems is becoming a more complex business activity these days. Intuitive management of business systems, in more complex market conditions is becoming more difficult and insecure. This is why even the smaller business systems are forced to develop (introduce) information systems which provide management with adequate information for planning, organizing, running and controlling the executive body management and business process development. This paper examines project information system within business processes that take place in business system development.

INFORMATION SYSTEM DEFINITION

Every business system must have an information system that gathers, stores, saves, processes and delivers information, i.e. communicates within it self and with its surrounding. Information system is thus a subsystem of a business system. (See picture 1.).

Picture 1: Business system as a whole combined by basic, information and management subsystems.



Organizing business information system does not mean organizing a single subsystem (namely information subsystem) among other subsystems that combine a business system, but rather organizing the entire business system from an information point of view. Thus it is not possible to isolate the information perspective neither from the basic process or the management process nor from its connection to the surrounding. (Kajzer S. 1987. p.39-41).

The aim of the information system is to deliver the right information in the right place within the business system, at the right time, while creating minimum expenses in order to meet the needs of business process execution and business system management.

Given the market orientation of business systems it is clear that they need constant, daily and instant input of information, as well as the assessment of the relation between gathering, processing and delivering information on one hand, and the value that the information has, or will have, on the other. (Srića V., 2000. p.8).

In theory and in practice we come across different definitions of information system within the business system. These definitions refer mainly to the information systems upheld by information technology. The development of information systems moves quite quickly and therefore the term information society is no longer unknown. We are all aware that the key resource in business system is knowledge (information in the wastes sense of the word), key technology that will enable the flow and the spreading of information is information technology.

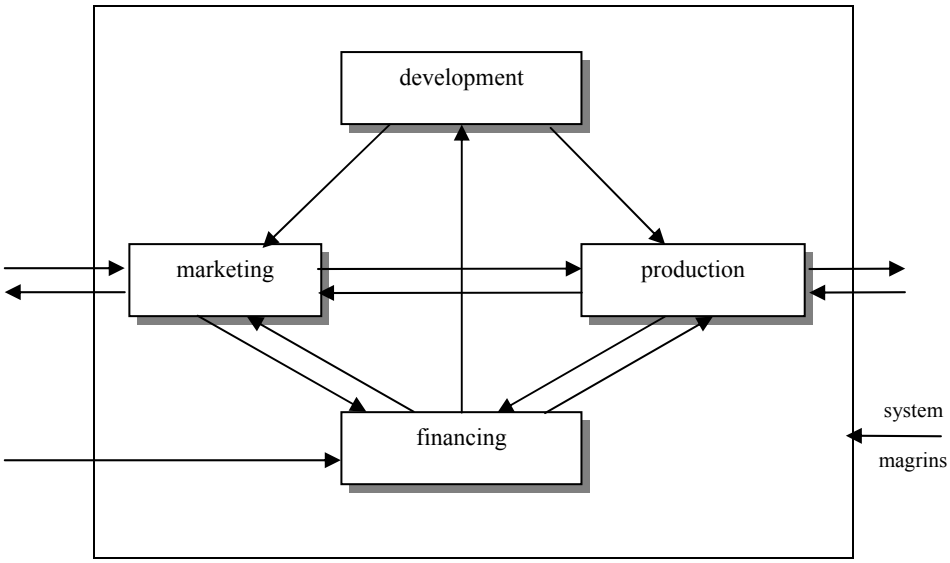
Information system is a system in which people and means of information technology (computers, programmes, communication network) follow determined procedures in order to timely deliver certain data, i.e. information to those who need them. (Varga M.,1998. p.41).

International Federation for Information Processing – IFIP offers the following definition of information system: Information system is a system that gathers, stores, saves, processes and delivers information important to the organization and to the society, in order to keep them available and usable to those who want to use them, including managers, clients, personnel and others. Information system is an active society system that can, but not necessarily has to, use information technology.

Kajzer views information system as a process which, together with the management process and the basic (reproduction) process, constitutes the business system.

Information system of a business system is combined by elements that themselves can be seen as subsystems. Picture 2. represents an information system of a business system which consists of 4 information subsystems: development, marketing and financing. Each subsystem has the task of performing information activities for a given business subsystem field and enabling the integration in the single information system of a business system.

Picture 2: Subsystems of a business system



Information system must provide data, information and adequate information technology for:

a) running of business processes,
b) management (subsystems and business functions etc.),
c) expertise basis for management decision-making and,
d) main business system management.

Business processes within a business system have been divided into executive, adaptation and development business processes and this subdivision is used as basis for determining the running and the managing of business processes.[2] Accordingly, we can distinguish two basic business system application fields:

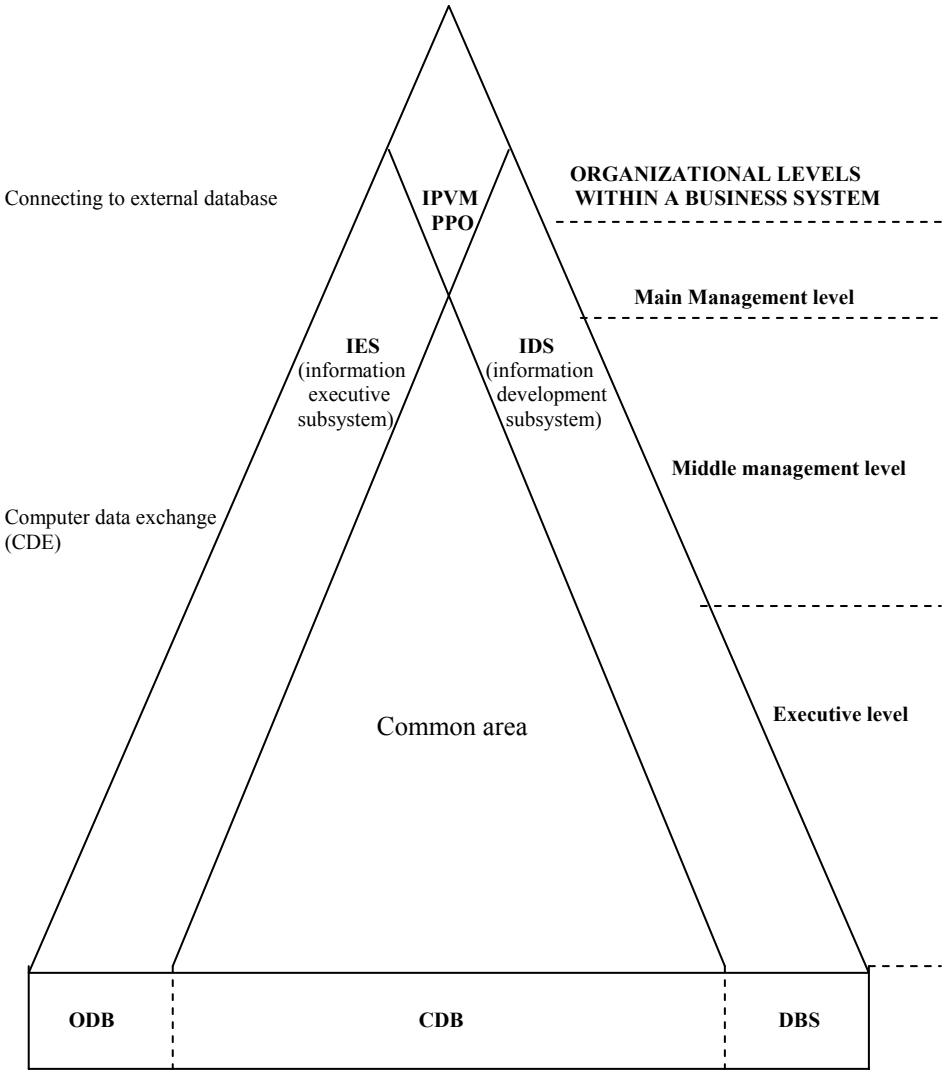
1) information executive subsystem (IES),
2) information development subsystem (IDS).

Picture 3. shows the concept of the information system and the fields of its application. From the picture we can easily see that the IES and the IDS overlap thus creating a common area in which the IES has to take into account the demands of the IDS and vice versa. Each of the cited information subsystems creates its own operational database (ODB), and a common database (CDB) for the common area

[2] Process division in management follows the logic that, when distinguishing typical management functions, firstly takes into consideration the features of business processes that are the very subject matter of management processed within the business system. We use Printz's management dimensions as a starting point. According to Printz management should be determined through three dimensions, namely: executive management, adaptation and development. Furthermore, he claims that management success, at the overall business system level, or at the determined subsystem level, depends on the presence of these dimensions, which are, at the same time, the main task of each management. (Princ L. 1983).

which is obligatory both for the IES and the IDS. The decision-making backup subsystem (DBS) is tailored for managers from the middle management level and experts who are preparing the basis for decision-making activities. Main management information subsystem (MMIS) is used to meet the needs of the main management by providing a horizontal representation of business system activities.

Picture 3: Information system structure and connections between organizational levels within a business system



INFORMATION DEVELOPMENT SUBSYSTEM

Information development subsystem (IDS) provides all the necessary data and information that executives and managers in charge of business system adaptation and development projects need. These projects are carried out at the business system level or at one of its subsystem levels. See table 1.).

Table 1: Example of project classification in business systems

TYPE OF PROJECT	PROJECTS	ADAPTATION MANAGEMENT	DEVELOPMENT MANAGEMENT
PRODUCT/SERVICE INNOVATION PROJECT	New product/service adoptation project (P/S) – outside existing P/S programme		x
	Introducing new P/S project within existing P/S programme	x	(x)
	Innovation of existing P/S project	x	(x)
MARKET PROJECTS	Winning new markets project		x
	Introducing innovations on existing markets project	x	(x)
	Market procedure innovation projects	x	(x)
	Market research project	x	
TECHNOLOGICAL PROJECTS	New technologies research projects		x
	New technology adoption projects	x	(x)
	Maintenance and repair projects	x	
STRATEGY AND PROGRAMME PROJECTS	Research and elaboration of new business strategies projects	x	(x)
	Annual plan elaboration projects	x	
	Business analysis projects	x	
BUSINES DEVELOPMENT PROJECT	Organisational projects	x	(x)
	Informatization projects	x	(x)
	Development and personnel training projects	x	(x)
	Location projects	x	(x)

(x) – examples that take place when projects within business systems appear as development or adaptation projects

The projects are the result of strategies carried out within business systems. The main trend is to transform strategies into projects, carried out by business systems in a determined period of time. The quick transformation of strategies into projects together with the quick and higher quality performance give rise to an advantage in business system competition.

Generally speaking we can say that the IDS has to satisfy information needs of the following (Semulić B. 1990.p.5): development and adaptation project management, project organization, executors, and all those involved in the project management process.

The executors need all the necessary information to carry out project activities. This information can be divided into: (Hauc A. 2002. p.178):

a) programme and
b) structural

Programme information contains all of the plan data necessary for the execution of the project. Plan data are contained in the project timetable and they include all of the necessary data on: project, content of activities, activity duration, time parameters of activities (date of beginning, date of conclusion, time reserve, fixed deadlines), previous and next activities, resources necessary for the carrying out of the activities, activity expenses, etc.

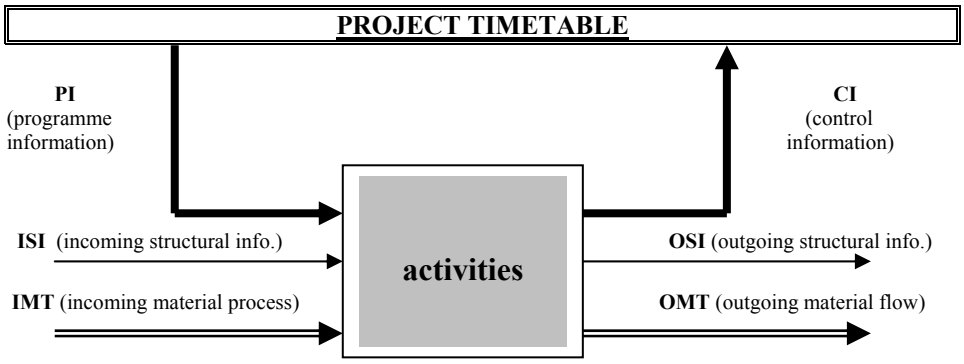
During the carrying out of the activity as well as during its conclusion, programme information transforms into control information. Control information reveals whether the planned activities were performed according to the activity timetable (programme information) and whether any discrepancies occurred.

Structural information offers all of the necessary instructions for the physical performance of activity, namely: project and technical documentation, data on materials, data on work subjects, internal organization instructions, internal and external technical standards, data on patents and licences, etc.

IDS is to provide all of the necessary programme and control information for the carrying out of the project as a whole, as well as for the carrying out of certain activities. Furthermore, it is to provide all of the structural information necessary for the performance of individual project activities (See picture 4).

This is why IDS should be connected to the national and international database as well as with the IES i.e. the common database (CDB). This database is common to both information systems (IDS, IES). In the first place it regards: work plan (programme and control information), business system resources (structural information) and financing and accountant activities (programme and structural information).

Picture 4: Ingoing-outgoing activity parameters



Information development subsystem (IDS) is combined by information systems of single business system projects. (PIS).

PROJECT INFORMATION SYSTEM

Definition

Project information system is an information system designed to meet the needs for information during the carrying out of the main system project and the custody system of the project, as well as for particular needs of the management and execution of the project execution system (Terak I. 1987, p.237).

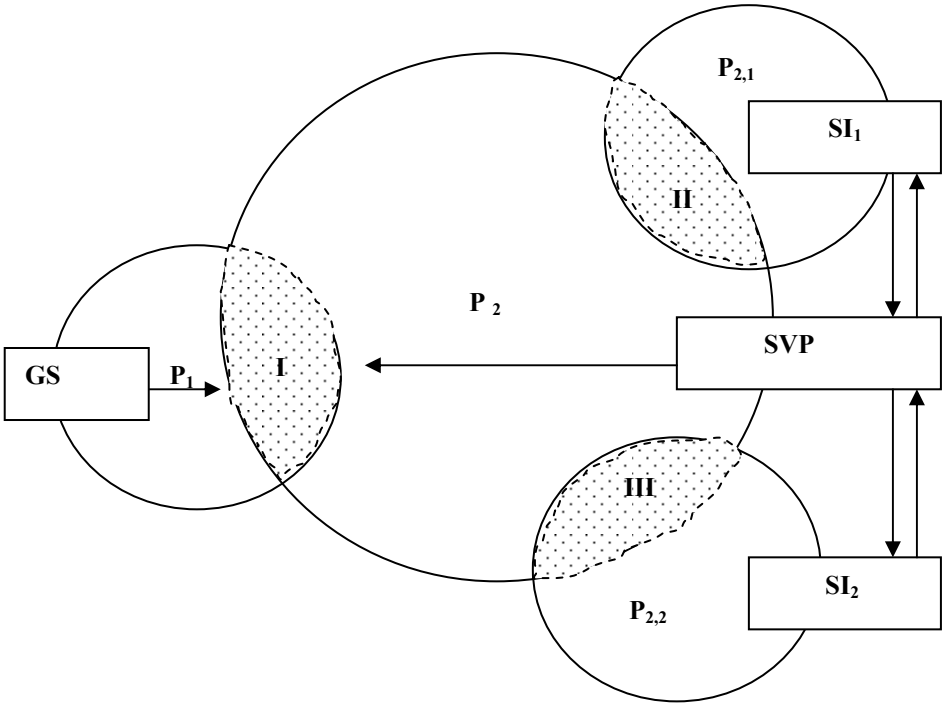
Project information system had to be designed in a way to meet the needs of the project and of the main organization. Therefore, it must contain preparatory, gathering, identification, classification, delivery, updating, archiving procedures for the information as well as the new access to the information itself. It must also distinguish different criteria when creating the information. This allows us to easily verify information before using them in a project (ISO 10006, 1997, p.14-17).

Fuctioning

Project information system (PIS) within a business system must be considered from two perspectives:

a) project information system (PIS) for a determined project. This information system combines the main system, project management system, function regulatory system, execution system and the project itself (See picture 5.)
b) project information system (PIS) for an overall project activity i.e. project programme within an information development subsystem (IDS) which is in this way integrated with the information system for the management of the entire business system.

Picture 5: Starting model of project organization



GS - main project system
P - main project system in the aim's structure
SVP - project management system as a project organization
P2 - SVP project in the activity structure of a paricular P1 project for which GS and SVP have decided to be handed over to be managed (gray area I)
SI1 SI2 - execution systems
P2,1 P2,2 - execution system subprojects that are included in the project by the SVP on the basis of the agreed work volume (gray area II and III)

If considered individually, the project information system contains a number of non-obligatory interconnected information systems which are used to assure project management. The role of the single information subsystems is to help establish a part of the management process. Project information subsystems are:

1. information subsystem for project conclusion
2. information subsystem for engaging resources
3. information subsystem for project launching
4. information subsystem for project documentation
5. information subsystem for the object of a project
6. information subsystem for project economics
7. information subsystem for project management

1) ***Information subsystem for project conclusion*** is envisaged for the creation of other information subsystems and it enables: determining of performance activity and technology, time analysis and time period estimate of a project, as well as the search for the best solutions, preparation of programme information regarding the timetable of the project, determining the flow of the incoming/outgoing activity parameters, project management according to the timetable and depending on the project management information subsystem.

The creation of that information subsystem is equal to the project planning tasks. The methods used here are mostly based on the internet planning techniques, and they are carried out with the help of the computer. The main database is the project plan database.

2) ***Information subsystem for engaging resources*** foresees the performing of activities on the project carried out by internal and external executors equipped with their own resources. This subsystem includes: resource individuation for the performing of project activities, optimal resource management within the project, terminating the use of resource, monitoring of the resource use, expense planning, and resource use account (linked to the information subsystem for the project economics), project execution management with the optimal use of resources.

This subsystem also uses internet planning methods and the improvement of the resource engagement.

3) ***Information subsystem for project launching*** includes: internal launching preparation in accordance with the timetable (internal execution system, for instance work orders, launching documentation, contracts etc.), external launching preparation in accordance with the timetable (external execution system, for instance: contracts, orders etc.), execution launching, preparation and structural information (regarding the information subsystem documentation and the object of the project), elaboration of an account based on project work orders (regarding the information subsystem for project economics), final processing of control information for the new launching (regarding information subsystem for project management).

On the basis of the timetable in accordance with the resources plan it is necessary to guarantee the beginning of project execution, i.e. the initial activities, followed by all the other activities. Activity launching is carried out by programme information launching, structural information launching or internal structural information and internal material flow launching. The database that supports the creation of that information subsystem is the launched and agreed database, connected to the plan database.

4) ***Information subsystem for project documentation*** includes: preparatory project documentation, (surveys, studies, investment programmes, layouts, etc.), executive project documentation (construction layouts, components, position layouts, technical documentation, project documentation for obtaining approval, execution, installation etc.), project documentation.

The purpose of the information subsystem project documentation is the following: providing files on preparatory project documentation and on structural information preparation regarding the information subsystem for project launching, providing structural information launching, updating files on project documentation,

providing fundamental conditions for the creation of the information subsystem project object, intended as the specification of the project object elements.

From the project management perspective, that information subsystem enables the creation of files on all project documentation and the preparation of structural information, as well as that of the information on internal material flows. This is why, for instance, on the basis of project documentation containing different components, specifications, etc. a list of necessary equipment is created to be supplied.

Necessary information for project management and execution system is obtained by combining information launching subsystem together with contract's database. Database supporting that subsystem is the file database on project documentation.

5) ***Project object information subsystem*** has the objective to: prepare all files on the base project, support objects and intermediate objects intended as incoming structural information and information on material flows for the entire project (list of basic and draft means, list of products, etc.), prepare all files on object according to different project activities, update files on object, regarding the information subsystem for project economics subsystem, issue accounts based on project work orders, regarding the information subsystem for project management, finally process control information.

Database supporting this subsystem is the project object database, which appears, depending on the project, as a database of basic means, registration and structural database of products, materials and equipment, etc.

The creation of that information subsystem corresponds to the organisation of project launching.

6) ***Information subsystem for project economics*** is closely linked to the already cited information subsystem using its databases. It supports project management from the expenditure planning perspective, as well as from that of the initial calculation financing, execution improvement, expenditure control, project account, expenditure distribution, etc. The creation of this information subsystem depends on:

1. whether project economics is involved in project organization tasks or
2. whether project economics tasks are carried out by the existing services within the business system

7) ***Information subsystem for project management*** combines all of the listed information subsystems into an overall information system, i.e. project information system (PIS) without which it is impossible to run and manage the project.

The aim of this subsystem is to "cover" information needs of all project participants, namely: main system, project management system in a form of project organization in an internal and external management system. Inside this information subsystem it is fundamental to provide common information for: project conclusion, project launching, management control, project documentation files, project object files, project economics, preparation of information for decision-making at the main system level and at the execution level.

The need for a project information system appears when the system is to be created only for a single one-term project. If a business system already has a model of such a system, it is merely necessary to prepare the system for application to a concrete

project or projects if carried out simultaneously. PIS is to be separated from the operative information subsystem (OIS) because they differ, although they use the same database.

Today PIS is supported by the development of the modern information technology which includes: special computer programme extracts and information tools, use of national and international databases, use of computer network, telematics' means (internet, video frequency systems, etc.).

Today, special programmes and information tools are used: computer programmes for project management based on a network plan (network software), support programme products for certain project management areas (specific functional software), "workplace" programme products (workplace software) and systems for the training of project organization staff (teachwork or CBT-Computer Based Training).

CONCLUSION

Project information system has to support for the project organisation structure and the very nature of work carried out on the project and it has to help accomplish the goal of the project. It is also to be used as a means of measurement of project success and as a means of stimulating project participants. It is to register informal information as well as the course of business process because they affect the final project results. It is to support future-driven team work, as a prerequisite for decision-making quality improvement on all levels.

Within a project information system we process: activities, their duration and deadlines, interdependence among activities, product sources and their distribution – time and location, expenses (continuous control of planned and real expenses, risks, support for knowledge acquisition on project as a future information, support for law-related knowledge, regulations, standards, etc., support for quality improvement and setting of new goals.

Quick and quality project or programme execution enables the reaching of strategic business system goals and thus the strategic competitive advantage for business systems. This is the area in which project information system supported by modern information technology can and must play a significant role.

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