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# Information management

## Distance study text

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Emphasis will be put on information management and related issues of data processing, information and knowledge processing and use. After learning about the definitions, roles, and roles of information management, other chapters are devoted to basic concepts such as data, information, knowledge, and documents. Further, the study text focuses on information support, information sources, acquisition, search and management of information, and a chapter dealing with the organization's information strategy, ICT management models and information systems in organizations. An in-depth part is also devoted to the issue of ICT in innovation as a support for increasing the company 's performance and trends in current information management.



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## **INTRODUCTION**

We live in an information society that brings a number of challenges in the form of an information explosion to efficiently process and exploit the ever-increasing volumes of data and information. An important trend is the growing share of services and their strong link to information technology. Information technology creates new jobs, collaborating global teams and new information and communication systems that should replace or relieve everyday routine human work and allow employees to have more time for their own creative work.

This distance study text is intended primarily for students of Managerial Informatics at Silesian University in Opava, Faculty of Business Administration in Karviná. This does not, however, mean that the study text cannot be used by students of other study programs as well. The aim of the study is to look into the issues of information management and other related concepts, which are explained in more detail in the individual chapters, when the following chapters are devoted to basic concepts such as data, information, knowledge, and documents after familiarization with the definition, tasks, and roles of information management. Further, the study text focuses on information support, information sources, acquisition, search and management of information, and a chapter dealing with the organization's information strategy, ICT management models and information systems in organizations. An in-depth part is also devoted to the issue of ICT in innovation as a support for increasing the company's performance and trends in current information management.

Basic knowledge of information and communication technologies (ICT) and the ability to search and process information from all available sources, with an emphasis on electronic information sources, are expected to be studied. This publication attempts to facilitate the study to the maximum extent by using different spacing elements in the text such as a quick overview of the chapter, the chapter objectives, the chapter's keywords, and also the text of the individual chapters of the definitions, the chapter summaries, the questions and the answers. Extensive elements for more detailed study for those who want to get additional information are used case studies, tutorial themes, and prospective sections.

## **FAST OUTLOOK TO STUDY**

This distance study text is intended primarily for students of Managerial Informatics at Silesian University in Opava, Faculty of Business Administration in Karviná. The aim of the study is to look into the issues of information management and other related concepts, which are explained in more detail in individual chapters.

Within the first chapter, it is necessary to get acquainted with the definition, tasks, and roles of information management. It also describes the historical development and differences of the former and current conception of information management, the method of information management and the conclusion of the chapter has defined the concept of the information society. The second chapter is devoted to basic concepts such as data, information, and knowledge. There are also clarified related concepts such as information literacy, information asymmetry, complete and perfect information. The third chapter deals with information support with a focus on support for management and marketing, support for management of production and logistics processes and support for crisis management. The content of the chapter is also information services and communication. The fourth chapter deals with documents and has the following subchapters: document types, document identification, document handling and object placement. The fifth chapter focuses on information sources, retrieval, search and management of information. Information sources include libraries, archives, museums, galleries, information centers, and centers, database centers, special institutions, electronic information sources. The search and retrieval of information discuss the issue of Internet search and usability of sites. The sixth chapter, titled the organization's information strategy, ICT management models and information systems in organizations, first defines the concept of information strategy, describes the ICT management in the company, ICT management methods and models, information systems in organizations, information audit, and the conclusion is the integrated management system using ISO standards. The seventh chapter titled ICT and innovation as a boost to business performance is addressed by Corporate Performance Management (CPM), Business Intelligence (BI), and Process Mining. The last chapter focuses on current trends in current information management, such as mobility and ubiquitous connections, Big Data, Social Media, Cloud computing and ICT as a consumer matter.

# 1 INFORMATION MANAGEMENT - DEFINITIONS, TASKS, AND ROLES



## QUICK REVIEW OF CHAPTER

Information management has its own definition, roles, and roles. Information management is a very important area of management that deals with collecting, processing, managing and distributing information to one or more users. Within businesses, the need for information from staff from different departments is increasing. This trend puts high demands on delivering correct, timely and necessary information also with regard to access rights to information itself.

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## OBJECTIVES OF CHAPTER

After studying this chapter, you will be able to:

- define the concept of information management,
  - define an information society,
  - clarify the difference between past and present concepts of information management,
  - define the information management,
  - introduce information management tasks,
  - know the role of an information manager,
  - introduce methods of information management.
- 



## TIME REQUIRED TO STUDY

The time needed to study this chapter is about 2 hours.

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## KEYWORDS OF CHAPTER

Information management, information society

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Information management is a relatively new concept, which, according to most reputable authors, does not have a totally unambiguous definition, because there is no full consensus on what all areas of activity mean this term.

The ambiguous definition is also given by a certain ambiguity in terms of management and information. Another reason is the permanent development of the understanding of the concept of information management when different concepts are changed from mere managerial conception to the view that information management also deals with data processing technologies, especially data mining etc.

## 1.1 Historical development

We can distinguish the three main stages of information management development. Each stage is not only a tool but also a focus on certain activities.

Stage 1 "engineering efficiency"

- the concept was introduced in 1966 by R. S. Taylor and colleagues in the framework of the conference on issues of system concept and processing of engineering information and teaching,
- focus on economy of hard work,
- associated with ICT application for mass data processing.

Stage 2 "Information Management as an Expression Tool for ICT Professionals

- the late 70s and 80s of the 20th century,
- the focus on the economy of IS / IT implementation and the orientation given to the automation of the procedures,
- Information management is understood as a set of management recommendations for the construction of IS / IT.

Stage 3 "Applying Managerial Approaches"

- The 90s of the 20th century,
- work with resources is also applied to the IS and information,
- a major focus on efficiency and effectiveness in redesigning and re-engineering processes.

## 1.2 The difference between the earlier and current concepts

The concept of information management is gradually changing. There are several definitions of the current concept of information management. Below are some of them.



**DEFINITION**

For example, Vodáček and Rosický (1997) state the following definition: "Information management can be defined as a transdisciplinary set of knowledge, methods, and recommendations of systemic approaches of computer science that help to appropriately implement managerial thinking approaches and negotiation to achieve the goals of the organization under consideration".

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From the point of view of today's concept, it is important that information management respects the primary needs of the managerial perspective and, at the same time, also provides economically with adequate information processes.



**DEFINITION**

"Information management is a conscious process that collects data that is used to support decision-making and management processes at all levels of enterprise management." (Hinton, 2006)

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It should be remembered that for managers, IS / ICT applications are not the primary goals in terms of information management. They are especially effective means of facilitating, streamlining and above all improving their behavior and meeting their individualized information needs.

### **1.3 Definitions and tasks of information management**

Information management can be included in the company's management tasks, which deal with the identification of internal and external communication problems. Within this concept, therefore, information management cannot be separated from the management process. Working with information in businesses and organizations is one of the essential organizational goals for which leadership must be responsible. Information management uses system approaches that provide methodological guidance not only for problem-solving but rather enable a comprehensive way of dealing with other influences.

**DEFINITION**

Information management is a complex system that can not be judged only from the point of view of data itself, but also from the point of view of those working with them. This is basically all workers at all levels of the business, who often have specific needs and requests for access to information. These specific information needs need to be taken into account in order to set up enterprise information management correctly.

Information management techniques are set up for information management. Appropriate forms of communication are identified and identifying which information appears rational to achieve the organization's goals.

## 1.4 Information manager role

The role of information management lies briefly in activities such as organizing, searching, retrieving, securing and maintaining information. Information management is closely related to enterprise management and data management. For example, as Tvrdíková (2008) says, it is very desirable for companies and institutions to employ information managers because their importance lies in ensuring the management of the process of increasing the quality of IS and ICT in a given company or institution. It works with the top management of the company, the head of the IT department, the system administrator, system integrator or outsourcing provider. The information manager is responsible for managing the development and operation of the entire IS / IT, ensuring the development of the IS / IT management model, ensuring compliance between GST and IST, addressing external suppliers, personnel management of IS / IT staff, IS audit management, IS / IT traffic.

Basic prerequisites for this job include:

- the ability to see ahead,
- the ability to formulate a strategy,
- ability to manage teams,
- communication skills,
- a global overview of IS / IT,
- knowledge of managing economic, organizational and personal factors of the company

## 1.5 Information management methods

Within the life cycle of information systems, management and executives responsible for information management are used to achieve the objectives of a particular method in

*Methods*

order to efficiently perform information management tasks. Basic methods of information management include analysis, synthesis, system approach, project management, optimization, audit and operational control.

- Method of analysis - is, in a general sense, a thought process that delimits a defined whole in its parts.
- Method of synthesis - represents the method of composing, joining, merging parts into an organic whole. It is the opposite of analysis.
- System Access Method - Supports solution to the problem by system view, allowing you to see the resulting system as a unity of elements and links between them.
- Project approach method - allows you to approach the preparation and design of an information system as a project, with all the necessary policies and approaches.
- Optimization method - represents the process of finding the most appropriate configuration or best practice with respect to specified criteria.
- Audit-is the method for verifying or evaluating the status and comparing it with the status required.
- The Operational Management Method - is based on the continuous monitoring of the state of the information system and the elimination of its shortcomings

## 1.6 Information Society

The first mention of the information society dates back to 1969 when Peter Drucker acknowledged the arrival of knowledge workers as the logical consequence of investment in education. The subsequent investment in electronic infrastructure meant the arrival of an information economy, also referred to as a network or digital economy.

This completely new economy then greatly changes the nature and definition of capital itself. Profits from intellectual capital as the primary source of wealth can dramatically increase in the network economy, as the total value of the network grows exponentially with the number of individual elements, as Vaněk (2013) says.



### **DEFINITION**

According to Jonák (2003), the Information Society is defined as "a society based on the integration of information and communication technologies in all spheres of social life to such an extent that it fundamentally changes social relationships and processes. The increase in information resources and communication flows is increasing to the extent that it can not be managed by existing information and communication technologies."

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Why is information so important? The answer is, for example, Vaněk (2013), which states that information has become one of the key sources of each organization. Significant is also their difference from material and financial resources, especially in the fact that their value decreases considerably over time and does not diminish, on the contrary. Data stored by employees in enterprise information systems is the property of an organization as well as systems themselves.

## QUESTIONS



1. What is typical for the 3rd stage of information management development?
2. Define the concept of information management.
3. Give at least 3 basic assumptions (abilities) for information managers.
4. What are the basic methods of information management?
5. How does information differ from material and financial resources?

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## SUMMARY OF CHAPTER



Information management can be defined as a transdisciplinary set of knowledge, methods and recommendations of systemic approaches of informatics that help to appropriately implement managerial thinking approaches and negotiation to achieve the goals of the organization under consideration. It is a conscious process that collects data that are used to support decision-making and management processes at all levels of enterprise management. Information management techniques are set up for information management. Appropriate forms of communication are identified and identifying which information appears rational to achieve the organization's goals.

The role of information management lies briefly in activities such as organizing, searching, retrieving, securing and maintaining information. Information management is closely related to enterprise management and data management. The Information Manager is responsible for managing the development and operation of the whole IS / IT, ensuring the development of the IS / IT management model, ensuring the consistency between GST and IST, dealing with external suppliers, personnel management of IS / IT staff, IS audit management, development and operation of IS / IT.

Basic methods of information management include the following: analysis, synthesis, system approach method, project management method, optimization, audit and operational control.

An information society defined as "a society based on the integration of information and communication technologies into all areas of social life to such an extent that it fundamentally changes social relationships and processes. The increase in information resources and

communication flows is increasing to the extent that it can not be managed by existing information and communication technologies. "

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## **ANSWERS**

1. Significant focus on efficiency and effectiveness in redesign and re-engineering of processes.
  2. Information management is the process by which data is collected that is used to support decision-making and management processes at all levels of corporate governance.
  3. Ability to see ahead, ability to formulate strategy, ability to manage teams, global IS / IT overview.
  4. Method of analysis, synthesis, system approach, project approach, optimization, operative management.
  5. From material and financial sources, the information differs in particular from the fact that their value decreases significantly over time and does not diminish.
-

## 2 DATA, INFORMATION, AND KNOWLEDGE

### QUICK REVIEW OF CHAPTER



Data, information, and knowledge affect the lives of all of us, whether it's day-to-day activities or work activities. This is because we live in the information society, where information has become one of the key sources of each organization. This chapter deals primarily with the relationship of data, information, and knowledge. Information literacy, asymmetry of information, complete and perfect information will also be mentioned.

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### OBJECTIVES OF CHAPTER



After studying this chapter, you will be able to:

- define and learn to recognize the differences between data, information, and knowledge,
  - indicate what information literacy is,
  - know what are information literacy requirements,
  - clarify the concept of information asymmetry and occurrence in the real world,
  - define complete and perfect information.
- 

### TIME REQUIRED TO STUDY



The time needed to study this chapter is about 3 hours.

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### KEYWORDS OF CHAPTER



Data, information, knowledge, information literacy, information congestion, information asymmetry, complete and perfect information.

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What is the relationship between data, information, and knowledge? Normally, this linear chain is commonly referred to in the literature: data -> information -> knowledge. Information is thus generated from the data, and it is then possible to obtain and derive

knowledge from the information. Further, all the above terms will be defined in more detail in the text.

## 2.1 Data

### Data

Data, in general, represent the reflection of certain phenomena, processes or properties within a real-world part. It is, therefore, the expression of certain facts and thoughts in the prescribed form so that they can be transferred and processed. According to Vaňek (2013), data objects can be symbolic, manuscripts, forms, production documentation, computer files, visual (visual), technical drawings and diagrams, artworks, technical means, acoustic, works, speech records.



### DEFINITION

Doucek (2010) states that data is a formalized record of human knowledge by means of symbols (characters). According to Sklenák (2001), data is the basic raw material from which information can arise. The meaningful information then arises in the process of human interpretation.

In the context of information technology, data can be defined as a composite designation for numbers, text, sound, images and any other perceptions in a format that can be processed by computers and are an inherent element of an enterprise information system.

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Data is obtained by writing, measuring, or observing, and can be divided into continuous and attributable data. The data is primarily used for the following activities: calculations analyzes and planning. The data can also be generated automatically as output from different sensors or other devices recording the measured data.

One of the basic breakdowns divides the data into the following groups:

- Quantitative - these are the numerical characteristics of the observed phenomenon (eg price, quantity, temperature, etc.), sometimes the term "hard" is used
- Qualitative - these are the non-numerical characteristics of the observed phenomenon (eg, customer satisfaction with the product or service), sometimes the term "soft" data

Qualitative data is broken down as follows:

- nominal variables
- ordinal variables



Nominal data - two values of a nominal variable can be said to be identical or different (eg manufacturer, model, type ...)

Ordinary data - as nominal, in addition to two values of the ordinal variable, we can determine the order (eg customer satisfaction rate, product quality evaluation ...)

Quantitative data is broken down as follows:

- Differential variables
- Ratio variables

Differential (interval) - as ordinal, in addition, it can be determined how much one value is greater than the other one.

Ratio - as a difference, you can also calculate how many times one value is greater than the second.

According to Sklenák (2011), the following can be distinguished from the point of view of the data:

- Structured data - explicitly capture facts, attributes, objects, etc. The existence of certain data elements is an important feature. A typical example is data storage using relational database systems, where elements such as fields, records, sessions, databases are used. In this way, only those data that are necessary for solving information needs and solutions to decision-making problems can be selected.
- unstructured data - expressed as "by-pass flow" without any further resolution, for example video, sound recordings or pictures. Also included are text documents.

According to Sklenák (2011), the data is actually a "raw material" from which information can be generated. For example, data "4564135" or "Porthos" certainly represent something real from the outside world, but without any further description or context makes no sense.

## 2.2 Information

Information is the result of data processing. Without data, no information could be generated. In conjunction with the data, the word "information" can be defined as data that is used to create a meaningful and useful context and can be used in the decision-making process. The information thus becomes processed data, which the user attributes to a particular meaning, which satisfies the specific information needs of the given recipient.

*Information*

The basic conditions for the usability of the information are the following assumptions:

## *Data, information, and knowledge*

- communicability of information - the possibility of disseminating knowledge through transmission channels,
- clarity - encoding knowledge into the language known to the recipient,
- novelty,
- reducing uncertainty in the decision-making process,
- usability for knowledge and decision making by explaining the meaning.

The main features (attributes) of information include:

- the inseparability of information from the physical carrier,
- aging - Information ages not over time, but with newer, more relevant information,
- cumulative - Creating new information will not destroy old information (usually changing its value)
- utility value,
- accuracy, truthfulness - number of errors (noises), or data storage errors (e.g., when overwriting),
- accessibility - the ease and speed at which information can be obtained,
- flexibility - usability for more than one user;
- relevance, which is characterized by its fullness, completeness, ie whether the information contains everything we need and adequacy, ie whether the information does not contain what we do not need,
- clarity - degree of ambiguity and ambiguity,
- verifiability
- descriptive (identifying) attributes, for example in a bibliographic description including the author, title, publisher, date of birth, extent, place of birth (release), place of storage,

Some properties of the information are quantifiable according to Vaněk (2013) (accuracy, truthfulness, accessibility, speed, flexibility, dispersion). Some attributes can not be quantified (relevance, clarity, verifiability).

- relevant - relate to the problem,
- valid - they express what they have (do not show any system errors);
- reliable - getting them by the same methods always results (they do not show any random errors),
- fast enough and cost-effective - the most important information is current.

Within the theory of information, we often encounter the following terms: syntax, semantics, and pragmatics. According to Doucek (2010), these terms can be defined as follows:

- The syntax is given by the rules for creating formal structures, and in the broader sense, it includes not only the traditional "grammar" (sentence composition) but also the shared form of writing and encoding of symbols.
- Semantics relates to the relationship of symbols and designated reality, thus allowing symbols or their structures to attribute content. At this level, we talk about messages or messages that contain information.
- Pragmatics refers to the relationship between the symbols and the recipient and, in a particular situation, guides his / her actions. It is only at this level that information gains importance and influences human thinking and action.

## 2.3 Knowledge

### Knowledge

Knowledge is, according to Doucek (2010), an individual character. It is primarily bound to the individual and its nervous system. There is nothing to do with the fact that its shaping, transmission, and codification are influenced by the social (culturally). Knowledge is an organized pattern of human knowledge that results from self-organization of the nervous system.

### DEFINITION



The concept of knowledge can be characterized as a certain ability or information on how to use data and information in different situations.

Its formally expressed form uses language, or symbols, which then form partial knowledge. It is stored as data that is then individually interpreted by individuals as information.

Knowledge can also be defined as interconnected structures of related knowledge and their representation in the form of a cognitive model, together with the ability to perform various cognitive operations with them. Thanks to these operations, we can partly predict what can happen in the real world. (Sklenák, 2001) There are different concepts of knowledge and sharing in the following Table 1.

**Table 1: Different concepts of knowledge and their sharing**

Knowledge	Individual	Shared
explicit	presented using language and symbols	communicated in the company or embedded in the used models
implicit	the self-organizing process of the nervous system forming patterns	various aspects affecting communication, including information technology

Source: Doucek (2010)



## DEFINITION

According to Ivánek, Kempný, and Laš (2007), the knowledge engineering is applied in the field of artificial intelligence, which deals with the acquisition, processing, representation and automated use of knowledge.

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Knowledge engineering can also be defined in the context of information engineering, a discipline dealing with the processing of information in a usable form. Knowledge engineering is then divided as part of information engineering, focusing on information on how to reach new information, ie information on the judgment in specific situations. The practical result of knowledge engineering is expert systems, which are programs that provide knowledge-based conclusions.

## 2.4 Information literacy

Information literacy together with financial literacy is one of the basic prerequisites for orienting itself in today's dynamic world.

Information literacy is, according to Vaněk (2013), able to process and use information in different formats, from different sources and the ability to understand them. The information is presented in the present environment mainly in electronic form, through information and communication technologies.

Information literacy involves several steps, namely the ability to identify the problem, understand and formulate questions whose answers can lead to a solution. According to Vaněk (2013), information literacy requires meeting the following requirements:

- identify problems, define them and identify issues that require a child response,
- identify the circles of information that needs to be found for problem-solving,
- find the required information,
- evaluate, filter, analyze, and synthesize information,
- share and transfer information,
- present information.

The big problem today is that data and information are growing faster and in larger volumes. This state of affairs generates more often in people so-called informational congestion, which expresses situations in which an individual can not effectively deal with information because information is surplus and unable to process it in adequate time. Everything is due to the limited possibilities for people to find, process and understand information. The notion of information concealment was mentioned in the 1960s when Miller (1960) defined seven different categories of information congestion.

- deletion, oversight - inability to process some suggestions,
- error - some information is not processed correctly,
- sorting into queues, sequencing - processing of some information is postponed, they will be processed later,
- filtering - processing only the information that appears to be the highest priority,
- zooming in - lowering discrimination standards by reducing accuracy in input and response evaluation,
- multiple channels - split incoming information into parts to divide responses,
- escape - complete ignoring incoming information.

There are many causes of information overflow. The most common are, for example, according to Vaněk (2013) the following causes:

- the increasing amount of information we sometimes call the information explosion is not just about data volumes, but also about the number of sources where the data is,
- problems with sorting information and assessing to what extent the information is useful,
- verification of information as the availability of information sources has increased and not every source is able to provide true, accurate or verifiable information,
- the accuracy of the results obtained and timeliness can be assessed from the point of view of the user himself/herself, from the point of view of the capabilities of the information system used, sources of inaccurate information may be obsolete or inconsistent databases,
- lack of information literacy,
- communication.

## 2.5 Asymmetry of information

The concept of asymmetry occurs in several areas. This term is often used by economists (asymmetry of information), computer science (asymmetric encryption), as well as military strategists (asymmetric war). The word asymmetry in simple terms then means non-symmetry and is, therefore, the opposite of symmetry and therefore symmetry.

*Asymmetry of information*

### **DEFINITION**



A large economic encyclopedia (Žák, 2002) defines asymmetric information as "an economic situation in which economic negotiators (eg sellers and buyers) have different information. Asymmetric information thus becomes (together with the existence of monopoly, externalities and public goods) one of the causes of market failure".

A widely concept of asymmetric information such as market failure along with imperfect information is also the Economic Dictionary (Hindls, Holman and Hron, 2003).

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### **FOR THE INTERESTED**

The asymmetry of information is part of a wider issue of uncertainty that has emerged in economic theory with the book by FH Knight *Risk, uncertainty, and profit* from 1921, and in particular the *General Theory of Employment, Interest, and Money* by JM Keynes of 1936. The theoretical basis of the information asymmetry itself was published by Akerlof in 1970 in *The Market for "Lemons": Quality Uncertainty and the Market Mechanism* (Akerlof, 1970). Information asymmetry is explained here in the example of a used car market, with poor quality used cars being referred to as "lemons". Less information on the quality of the offered cars is available to buyers than the seller. Buyers do not want to buy dear poor cars. As a result, high-quality cars will be underestimated, while lower quality cars (lemons) will be revalued.

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Vaněk (2013) states that the notion of information asymmetry means that one party to the transaction is better informed than the other (the counterparty). It follows from this definition that one party or participant has more information, has different or better information. In practice, this leads to a growing degree of uncertainty in decision-making. This uncertainty results from the fact that decision-makers often do not have complete information about the situation they are addressing because they do not know the detailed characteristics of all the other participants in the transaction, they do not have information about the results of previous transactions, or know all possible alternatives to a possible procedure at a given moment.

Information asymmetry is one of the causes of market imbalances. The modern concept of asymmetry of information emphasizes the fact that our information on the current state of the markets is imperfect and, in particular, that the various market players differ significantly in the quality of their information, which has serious consequences for the behavior of these markets. Using asymmetric information, it is possible to explain the behavior of economic subjects in such phenomena as negative selection, moral hazard or the preference of existing conditions.

It is perhaps a little surprising that the asymmetry of information is happening nowadays, despite the general availability of modern technologies that allow rapid transfer of information. Although it is possible to trace information, it is not always possible to do so in a very short time and there is always a risk that the information will not be up to date.

There are various causes of information asymmetry. One of the most important is the price of information because obtaining information requires some cost. The rationally behaving user then seeks to obtain as much information as possible so that the cost of obtaining them does not exceed the benefit of the information. Other factors contributing to the asymmetric distribution of information include, for example, cultural or religious differences in perceptions of information.

People and institutions have been using asymmetry of information for many centuries in various fields of human activity where it is necessary to gain an advantage over the other (politics, trade, war conflicts, gambling, etc.).

### **SOLVED TASK**



Examples of one-sided asymmetry of information:

- most retailers know more about the product sold than a dealer,
- most retailers know more about the service they sell than the buyer (brokers, realtors, and insurance agents).

Examples of two-sided asymmetry of information:

- the relationship between the borrower and the bank,
- the relationship between the job seeker and the potential employer.

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The information asymmetry is not always advantageous. There are also cases where it is not in the interest of a better-informed party to maintain too much asymmetry of information (eg improving market functioning, international cooperation, etc.). In these cases, a better-informed party will share a piece of information to reduce or eliminate asymmetry of information. In addition to free sharing, there is also information disclosure required in order to reduce the informational asymmetry between market participants (eg, the reporting of market participants' reporting obligations as the mandatory scope of the business report).

## **2.6 Complete and perfect information**

We are talking about complete information according to Vaněk (2013), if all participants have the same information, including information about all the remaining participants.

The concept of complete information is often used, for example, in economics or game theory where complete information is one of the necessary theoretical preconditions for perfect competition. We are talking about the perfect or perfect information if it provides the same level of information for all solutions to the problem. In the real world, most information is imperfect.



## QUESTIONS

1. Define the term data
  2. Define the term information
  3. Define the term knowledge
  4. Define the term syntax
  5. Define the term semantics
  6. What are the categories of information overload?
  7. Define the concept of information literacy
- 



## SUMMARY OF CHAPTER

In the context of information technology, data can be defined as a composite mark for numbers, text, sound, images, and any other perceptions in a format that can be processed by a computer and are an inherent element of an enterprise information system. Data is the basic raw material from which information may arise. Information is the result of data processing. Without data, no information could be generated. In conjunction with the data, the word "information" can be defined as data that are used to create a meaningful and useful context and can be used in the decision-making process. The concept of knowledge can be characterized as a certain ability or information on how to use data and information in different situations.

Information literacy is the ability to process and use information in different formats, from different sources and the ability to understand them. Asymmetry of information means that one party to the transaction is better informed than the other (the counterparty). It follows from this definition that one party or participant has more information, has different or better information. In practice, this leads to a growing degree of uncertainty in decision-making. We are talking about complete information if all participants have the same information, including information about all the remaining participants. The concept of complete information is often used, for example, in economics or game theory where complete information is one of the necessary theoretical preconditions for perfect competition.

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## ANSWERS

1. Data generally represent the reflection of certain phenomena, processes or properties within a part of the real world. It is, therefore, the expression of certain facts and ideas in the prescribed form so that they can be transmitted and processed



2. Information is the result of data processing. Without data, no information could be generated. In conjunction with the data, the word "information" can be defined as data that are used to create a meaningful and useful context and can be used in the decision-making process.
  3. The concept of knowledge can be characterized as a certain ability or information on how to use data and information in different situations.
  4. The syntax is given by the rules for creating formal structures, and in the broader sense, it includes not only the traditional "grammar" (sentence composition) but also the shared form of writing and coding of symbols.
  5. Semantics relates to the relationship of symbols and the designated reality, thus allowing symbols or their structures to impart content. At this level, we talk about messages or messages that contain information.
  6. Exit, overlook, error, queue, filtering, multiple channels, escape.
  7. It is the ability to process and use information in different formats, from different sources and the ability to understand them.
-

### 3 INFORMATION SUPPORT



#### **QUICK REVIEW OF CHAPTER**

Information support is necessary for a number of business strategies and processes. It is particularly important in the areas of management and marketing, management of production and logistics processes, as well as crisis management. If a high-quality and effective information support system is in place, managers can simply work with the data obtained, perform their own analyzes, and interpret the results of these analyzes to make the right decisions on business and institution management and strategy. Within any information support, it is very important to use all possible available information services as well as effective communication for obtaining information and feedback linked to possible variants of individual decisions.

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#### **OBJECTIVES OF CHAPTER**

After studying this chapter, you will be able to:

- provide opportunities for information support for management and marketing,
  - provide information support options for production and logistics processes,
  - provide information support options for crisis management,
  - define the concept of information service, information source, information source, information proces and concept of communication.
- 



#### **TIME REQUIRED TO STUDY**

The time needed to study this chapter is about 4 hours.

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#### **KEYWORDS OF CHAPTER**

Information support for management and marketing, information support for management of production and logistics processes, information support for crisis management, information services, information source, information process, communication.

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Information support is necessary for a number of business strategies and processes. In some cases, the concept of information support is used more freely. This indicates an offer of options and tools to secure or perform a certain activity (for example project processing).

### DEFINITION



Information support is a set of activities that support information-management, decision-making, and cognitive processes.

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The following subchapters will include the use of information support for the following areas: support for management and marketing, support for management of production and logistics processes, support for crisis management.

## 3.1 Information support for management

From the point of view of information support of management, the following information systems are the most important:

- Managerial information systems
- Decision support systems
- Information systems to support top management

### 3.1.1 MANAGERIAL INFORMATION SYSTEMS

MIS

Managerial information systems are used for work and management decision making, resource utilization, and so on. It consists of subsystems for marketing, production, finance, staff and more. The input is data in databases and the output is a summary.

### DEFINITION



Sodomka and Klčová (2010) report that the Management Information System (MIS) represents IS / ICT support for both topical and operative decision-making, which can either take the form of unified, object-oriented databases designed for this purpose or simple analyzes performed in databases of transaction systems.

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From the above definition, the following are essential:

- Modern MIS is not only used to support strategic decision-making, as data analysis results from operational applications are also used in operational activities
- Modern MIS requires a different view of its incorporation into enterprise architecture, building, and functional requirements
- Modern MIS is a more broadly defined concept than a data warehouse because it covers more complex analytics data processing than a data warehouse that can be an optional part of it if necessary.

The users of the analytical systems, where we rank MIS, are, as a matter of course, the employees of the Vocational and Medium Management. Managers get information for strategic and operational decisions.

Among the users of the transactional system, such as Customer Relationship Management (CRM), Enterprise Resource Planning (ERP), or Supply Chain Management (SCM) systems, we typically include accountants, traders, masters in manufacturing, etc. Transaction systems are systems for managing core business processes. The input to these systems can be, for example, the quantity of the material and the output of the invoice and order.

From the point of view of the philosophy of data processing within the MIS, the FASMI (Fast Analysis of Shared Multidimensional Information) concept is important, where the unsorted acquired data is processed on the basis of the following characteristics:

- fast - fast (allows for good use of management analyzes flexibly and quickly),
- analysis - analytical (provides the necessary analyzes),
- shared - shared (allows enterprise-wide shared results),
- multidimensional-multidimensional (allows multidimensional analysis),
- information - information (output of good and correct information).

According to Sodomka and Klčová (2010), the expected benefits of MIS can be summarized as follows:

- economic benefits (return on investment to MIS in the form of a higher level of managerial decision support, and related to more efficient company management, reduced costs, greater competitiveness, etc.)
- the benefits of developing IT infrastructure (use of data warehouses, integration of enterprise applications),
- Subjective benefits (stemming from the subjective feeling of improving management support through MIS and using eg OLAP analysis, data aggression, etc.).

### 3.1.2 DECISION SUPPORT SYSTEMS

Decision support systems have specific functions that help decision makers. The input includes data from the MIS and output, for example, problem factors and possible solutions. DSS

#### DEFINITION



Decision Support Systems (DSS) are designed to help managers implement management and decision-making activities in business. These systems make it possible to compare the partial results of the solution with the ideas and thus to influence the further course of the solution. What is important is that these systems provide the user with solutions and, if appropriate, ask questions to guide the process.

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However, it is necessary to accept the fact that the decision support systems do not replace the decision-maker (manager) itself, so their result is not the final decision, but only give the executives a set of variants, speed up and refine calculations and quantify potential risks.

### 3.1.3 INFORMATION SYSTEMS TO SUPPORT TOP MANAGEMENT

Information systems to support top management are top management systems. The input is information about the company's surroundings and the output is a summary of the information.

#### DEFINITION



EIS

Executive Information Systems (EIS) are a specific type of DSS that is designed specifically for senior management. These systems provide managers with easy access to relevant information (both internal and external) needed to succeed in ad hoc analyzes and also enable effective monitoring of key business information.

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These systems, as reported by Tvrdíková (2008), create from the basic data of operative character strictly structured and highly aggregated data with high information value. Multidimensionality is also used to quickly and easily generate new data lookups, search for trends (trending characteristics), an indication of deviations of key indicators from planned values and also a prediction of further developments.

## 3.2 Information support for marketing

In terms of information support for marketing, the following information systems are the most important:

- Marketing information system
- Customer relationship management system

### 3.2.1 MARKETING INFORMATION SYSTEM

Marketing is a very important activity in the competitive fight and it is, therefore, necessary to use maximum information support in this area.



#### DEFINITION

The Marketing Information System (MIS) includes people, facilities and procedures to collect, sort, analyze, evaluate and timely distribute the necessary and accurate information to marketers. (Kotler and Keller, 2013)

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According to Vaněk (2013) MIS represents several segments:

1. An internal information system that contains all of the organization's internal information. It is about the sources of information that the organization itself has, or is able to provide and obtain this information itself.

2. A marketing intelligence system that collects a set of practices and information resources that managers use to get information on daily and expected developments in the organization's marketing environment. The sources of information are very diverse: statistical surveys, daily and professional press, bulletins and other business publications, training sessions, seminars, conferences, personal information, suppliers, interviews with customers, and a very important source is also the Internet.

3. A marketing research system that involves systematically identifying, collecting, analyzing, and evaluating information and conclusions relevant to a particular marketing situation.

### 3.2.2 CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM

CRM

Getting new customers is sometimes as important as keeping the existing ones. In terms of information support, we are dealing with customer relationship management systems.

**DEFINITION**

Customer Relationship Management (CRM) means creating and maintaining long-term customer relationships. Customer communication is secured by appropriate technologies that provide value-added processes for both stock and company employees. (Wessling, 2003)

In essence, according to Dohnal (2002) CRM, the idea of setting the whole business together with business processes designed to reach out to customers and provide them with quality service. In general, CRM includes all processes that have direct customer contact in marketing, business, and service activities.

According to Dohnal (2002), customer relationship management includes three components:

- business processes,
- staff (human resources),
- technology.

### 3.3 Information support for management of production and logistics processes

Information support for the management of production and logistics processes is standardized within complex enterprise information systems such as ERP. ERP

**DEFINITION**

Enterprise Resource Planning (ERP) is a system whereby an enterprise (or other organization) uses ICT to manage and integrate all or most of its business areas such as planning, stock, purchasing, sales, marketing, finance, human resources, etc.

ERP systems have evolved from older software for manufacturing companies, where they have been developed in the various stages as follows: MRP (1970s) -> MRP II (1980s) -> ERP (1990s).

The ERP system typically covers four main areas, namely:

- finance (sometimes referred to as the economy),
- human resources,
- production and logistics (in the case of non-production enterprises only logistics),

## Information support

- marketing and sales.

Within the framework of complex ERP systems, the following modules are available as standard for information support for control of production and logistics processes:

- warehouses and inventory management,
- production planning,
- costing,
- purchase and receipt of goods,
- maintenance,
- quality management,
- project management,
- supplier ratings,
- transport.

### 3.4 Information support for crisis management

Information support for crisis management is based primarily on a crisis management information system and a uniform alert and alert system.



#### DEFINITION

Information support for Crisis Management by Skála (2014) is a process (a set of information activities) supporting information management, decision making, and cognitive processes. The objective of crisis management support is to meet the need through the information tools necessary for the performance of crisis management activities.

According to Skála (2014), the Crisis Management Information System provides the following processes and capabilities:

- monitoring process - gathering information from the environment,
- the ability to alert and inform the population - about the imminent threat or the emergence of a crisis situation (radio, television, teletext, public information boards, the Internet, news service, etc.)
- the ability to notify responsible staff to arrive at a designated location or crisis area,
- the ability to store and maintain information - about the territory and the risks that occur on it and can be a source of crisis situations,
- a system of decision-support support with the necessary information to provide information on the crisis, its characteristics, solutions options, supporting processes, security of rescue and liquidation work, logistical support,



- support for training and training programs - background for modeling, planning, teaching, research, development, exercises,
- source of optimization of institutions' activities and executive elements integrated into crisis management.

Warning and notification are very important moments when dealing with almost every extraordinary event. A unified alert and alert system serves to alert the population in the event of emergencies and crisis situations. These events may include, in particular, fires, floods, accidents,

The technical means of the alert and notification system include:

- electric rotary sirens, electronic sirens, municipal radio,
- telecommunication networks (radio, television, internet),
- mobile phones (alert SMS).

## CASE STUDY



Several tens of tsunamis are recorded every year on the planet. Devastating events resist over a period of several decades and, due to their origin, they are tied to large submarine earthquakes. Even today, the tsunami, despite the development and refinement of pre-science systems, often require large victims of life. The last such example is the disaster in the Indian Ocean in December 2004, the largest catastrophe of its kind in history.

The tsunami waves first hit the adjacent islands of Indonesia (within 15 min) and arrived at the shores of Sri Lanka and eastern India in an hour and a half. Thailand, albeit closer to the epicenter, recorded a rise in the level in two hours, as the tsunami was slowed down in the shallow waters of the Andaman Sea. Something came to Somalia after seven hours.

According to Indes (2015), four to five minutes are enough to reveal the destructive tsunami wave. Then there will be tens of minutes or at least minutes to save people. Without the technique, it is not possible. So far, they have only the Pacific Ocean - areas where four-fifths of all the tsunamis of the world are created. It was only after the catastrophe in Asia that other parts of the world began to think of similar war systems.

Used sources:

- <http://www.sci.muni.cz/~herber/tsunami2004.htm>
- [https://zpravy.idnes.cz/zahranicni.aspx?r=zahranicni&c=A050104\\_220816\\_zahranicni\\_miz](https://zpravy.idnes.cz/zahranicni.aspx?r=zahranicni&c=A050104_220816_zahranicni_miz)

### 3.5 Information services

We can look at information services according to Vaněk (2003) from different angles:

- institutional view, institutions that deal with information throughout their lifecycle,
- a process view in which information represents management support,
- marketing view, the information acts as a product on the market or as an ancillary service.



#### DEFINITION

Information services according to Vaněk (2013) purposefully and organisationally make information and information sources accessible to users in order to effectively satisfy their information needs. The input is the user's information request, resulting in required information in the specified structure and form. Part of the process is also very often to refine the requirement and to obtain or find information in appropriate sources and to process them.

Information activities include:

- the emergence of information,
- acquisition - obtaining information for preservation in funds, the essence of monitoring information production, selecting appropriate purchase or purchase documents,
- input processing - the obtained document is analyzed and an appropriate description is created including the characteristics of the content,
- depositing into a fund,
- search for funds,
- output processing - may include copying a document, printing a document, or another form of presentation,
- evaluation - analysis of found information and synthesis of new information,
- use of information,
- discard information.

The following terms will be explained: information source, information source, and information process.

**DEFINITION**



According to Vaněk (2013), the information source is a system that is a real or potential bearer, an intermediary or an information disseminator, such as libraries, database centers, information centers, television, radio.

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There are a number of aspects that can be used to divide information sources. There will be mentioned but the basic of them.

According to the originality of the content:

- primary - original messages, original documents, information obtained eg by marketing research methods, etc.,
- secondary information is based on primary sources, other secondary ones, such as information created for other purposes, but can be used for that purpose,
- tertiary - summary papers, overviews of the issue, synthesis of information.

Based on reliability and added value of information:

- unverified, unauthorized information,
- verified information, trustworthy, serious information,
- commented information,
- evaluated information.

By availability:

- public,
- commercial,
- classified.

According to the information change interval:

- relatively constant (eg information from history, architecture, etc.)
- variables with a long period of change (eg information on the structure of the industry, agriculture, the composition of the state population, political system, etc.)
- variables with medium change period (eg dates of long-term events, price lists, operating hours, the range of services, etc.)
- variables with a short change period (e.g., dates of performances, events, exhibitions and fairs, weather forecasts, etc.)
- constantly changing (e.g., the current status of reservations, the course of events, current weather in a given location, the location of objects, etc.).



**DEFINITION**

According to Vaněk (2013), the information source is a means of communication consisting of a carrier (or a bearer) of information, a set of fixed information such as a document (a book, a magazine), an expert in any field, etc. The boundaries between the information source and the source are not unambiguous.

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**DEFINITION**

According to Vaněk (2013), the information process involves the process of acquiring, processing, preserving, mediating and using information. It is a set of interrelated or non-interacting activities that convert certain inputs into outputs. It defines and creates relationships and structures between information sources and users and aims to overcome the barriers between the emergence and use of information.

---

A very important part of the information process is the transfer of information, which is going on according to Vaněk (2013):

- direct communication between the creator (source) and user (target) information (only a small part of the information),
- through an information system such as an expert library, a database center, a state archive, a business management system.

Of course, the flow of information is also in the opposite direction. User information generates new information, and for example, the user uses the original information creator.

### 3.6 Communication

**Communi-  
cation**

Communication and communication skills are among the most important human abilities, as it is a tool for mutual transfer of information and shared meanings among people. In addition to speech, other forms of communication, such as online communications, mobile communications, videophones, etc., have emerged in connection with the development of technology.

The scientific discipline of exploring communication phenomena, processes and systems is called communication science. Communication science defines the concept of an information string, which consists in the source encoding a particular message in characters and sending a message to a particular transmission channel. On the other hand, the communication is the recipient who decodes this message (message) and gains new insight. There

may be situations where the recipient does not receive the same data that was sent by the source. Then I can make mistakes and misunderstandings on the basis that the message (message) has been changed. This may be due to a number of factors, such as information noise, malfunctions or barriers.

The medium to which the information is transmitted is referred to as a channel. The technology channel can be, for example, a mobile phone, the radio is an acoustic channel.

The system of characters, understood by the source and the addressee, is the code. This can be, for example, the alphabet system, emoticons, lights on transitions, etc.

The actual components of the communication are divided into:

- hearing,
- visual - text and nonverbal communication,
- haptic (touch or tactile),
- olfactory (olfactory).

The communication system according to Kučerová (2007):

- connection, transmission,
- the process of passing information from source to recipient,
- the exchange of meanings (meaningful messages) between individuals through a common symbols system.

According to Vaněk (2013), the individual components are:

- message (message) - transmitted or received, information,
- source (resource) - the sender of information,
- encoder - the translator of the information into the code in which it will be transmitted,
- decoder - the translator of the information into the code in which it will be received,
- recipient (receiver): recipient of information,
- channel or channel - a sense-readable way of transmitting communicated content,
- noise: the occurrence of disturbances in the communication system causing loss or distortion of the information transmitted,
- feedback - information about the communication result that the recipient sends back to the source.



## DEFINITION

Most commonly, the term communication is understood as the transmission of information. Communication takes place in a particular language or code. Language is generally a necessary foundation for understanding the world and our thinking. A common language is necessary to pass on information to other people or objects we communicate with.

Communication can be direct (face to face) or indirect, mediated by communication or information technology, verbal or non-verbal.

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Communication is also referred to as a synonym for communication. In addition to classical spoken speech and fonts, other communication systems are used (musical notation, chemical, and mathematical marks, traffic signs, flag and finger alphabet, Morse alphabet, etc.). One major obstacle may be in the context of global communication, namely the fact that there are about 5,000 different languages, which are solved in practice by means of world languages, translations, interpreting, artificial international languages or machine translation.

According to Vaněk (2013), an important information channel for indirect communication is, in particular, institutionalized information systems (IS) based on system theory and cybernetics. IS have input (receipt of information), internal processing (information is stored and provided with a key for its later retrieval) and output (information is made available to the user).



## QUESTIONS

1. Define the concept of information support.
  2. What are the most important information systems in terms of information management support?
  3. What are the most important information systems in terms of marketing information support?
  4. What basic three components does the CRM include?
  5. Which four main circuits typically cover an ERP system?
  6. How do information sources differ according to availability?
- 



## SUMMARY OF CHAPTER

Information support is a set of activities that support information-management, decision-making, and cognitive processes. In terms of information support for management, the

following information systems are the most important: Managerial information systems, decision support systems, and Information systems for support of top management. In terms of information support for marketing, the following information systems are the most important: Marketing Information System and Customer Relationship Management System. Information support for the management of production and logistics processes is standardized within complex enterprise information systems such as ERP. Information support for crisis management is based primarily on a crisis management information system and a uniform alert and alert system.

The Management Information System (MIS) represents IS / ICT support for both top-level and operational decision-making, which can either take the form of unified, object-oriented databases designed for this purpose, or simple analyzes performed in transactional database systems.

Decision Support Systems (DSS) are designed to help managers manage their business decision-making and decision-making activities. These systems make it possible to compare the partial results of the solution with the ideas and thus to influence the further course of the solution.

Executive Information Systems (EIS) are a specific type of DSS that is designed specifically for senior management. These systems provide managers with easy access to relevant information (both internal and external) needed to succeed in ad hoc analyzes and also enable effective monitoring of key business information.

The Marketing Information System (MIS) includes people, facilities and procedures to collect, sort, analyze, evaluate and timely distribute the necessary and accurate information to marketers.

Customer Relationship Management (CRM) means creating and maintaining long-term customer relationships. Customer communication is secured with appropriate technologies that provide value-added processes for both shareholders and employees.

Enterprise Resource Planning (ERP) is an indication of the system by which an enterprise (or other organization) uses ICT to manage and integrate all or most of its business areas such as planning, inventory, purchasing, sales, marketing, finance, human resources, etc.

An information resource is a system that is a real or potential bearer, an intermediary or an information disseminator, such as libraries, database centers, information centers, television, radio,

According to the means of communication, the information source consists of a carrier (or bearer) of information, a set of information (eg, a book, a journal, etc.), an expert in some field, etc. The boundary between the information source and the source is unambiguous.

## *Information support*

The information process is a process involving the acquisition, processing, preservation, mediation, and use of information. It is a set of interrelated or interrelated activities that convert certain inputs into outputs. It defines and creates relationships and structures between information sources and users and aims to overcome the barriers between the emergence and use of information.

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### **ANSWERS**

1. Information support is a set of activities that support information-management, decision-making, and cognitive processes.
  2. Managerial information systems, decision support systems, information systems to support top management.
  3. Marketing Information System and Customer Relationship Management System.
  4. Business processes, workers (human resources), technology.
  5. Finance (sometimes referred to as the economy), human resources, production and logistics (in the case of non-production enterprises only logistics), marketing and sales.
  6. Public, commercial and classified.
-



## 4 DOCUMENTS

### QUICK REVIEW OF CHAPTER



The chapter deals not only with the definition of the document itself but also with the division into individual types, document identification, document work, object placement. A significant part is also devoted to the issue of electronic documents, which depend on the technical means, the standards of the environment used and, last but not least, on the program tools necessary for accessing their content. In terms of a huge number of different documents, it is absolutely essential for efficient work to make use of quick and accurate document search capabilities through the creation of internationally usable document identification systems.

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### OBJECTIVES OF CHAPTER



After studying this chapter, you will be able to:

- define the concept of documents,
  - get acquainted with document types,
  - identify different ways of identifying documents,
  - know how to work with documents.
- 

### TIME REQUIRED TO STUDY



The time needed to study this chapter is about 4 hours.

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### KEYWORDS OF CHAPTER



Document, document types, document identification, document handling, object placement

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To define the document, we will build on several definitions in Czech technical standards (ČSN) currently issued by the Office for Technical Standardization, Metrology, and State Testing.

*Document*



**DEFINITION**

According to CSN ISO 5963, a document is any item that has been made in a print or other way and can be cataloged or indexed. This definition relates not only to written and printed documents in paper or micrographic forms such as books, magazines, pictures, maps, but also non-printed documents such as machine-readable recordings, films, sound recordings, and three-dimensional objects or realms used as proofs.

According to the ČSN 01 0193 standards, a document is a material object which serves as an information source function, which can be cataloged and indexed.

ISO 9707 then defines the term document as recorded information, which can be considered as a unit in the documentation process, regardless of its physical form and properties.

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Vaněk (2013) states that the documents (information sources) are divided according to a number of criteria, eg according to the way (forms) of recording the content, by means of the medium (transmitted by energy, printed, electronic etc.) or issuing continuity (single or periodic) Documents can be identified, processed, exchanged as a whole (unit) between users and / or systems.

According to Vaněk (2013), electronic documents do not differ from traditional types of documents from content but some formal characteristics, especially from the digital recording of information. The content of the documents is independent of the media - the storage medium.

Electronic documents are dependent on:

- technical means,
- standards of the environment used,
- the programming tools necessary to access their content.

## 4.1 Types of documents

The most well-known types of documents include books, periodicals, and serial publications, special literature, gray literature and other kinds of documents.

### 4.1.1 BOOKS

The most famous type of document is probably a book that has existed in various forms since antiquity (from ancient scrolls to modern digital books). The book is referred to as the most effective, lasting and oldest means of communicating ideas.

Books

#### DEFINITION



In terms of professional definition, for example, according to ČSN ISO 5127, a book of mental work is written, printed or electronic, usually divided into pages and forming a physical unit. Another Standard CSN ISO 01 0166 defines the book as a printed or any other-made graphic document, bundled in the shape of a bundle and forming a thought and artistic whole.

Types of books by Vaněk (2013):

- monographs - a publication, systematically, versatile and in detail dealing with one topic usually narrowly defined, may be the work of one or more authors,
- proceedings - a set of individual articles of many authors, eg contributions from conferences, congresses, etc.,
- textbooks - learning material for different grades of schools,
- university script,
- manuals,
- encyclopedia (Educational Dictionary) - Alphabetically or systematically structured terms,
- dictionaries - language (translation, interpretation, terminology, glossaries,
- directories, phone directories,
- tables,
- guides,
- instructions,
- music,
- atlases,
- visual publications.

### 4.1.2 PERIODICALS, SERIES PUBLICATIONS

After books, the most well-known types of documents are undoubtedly periodicals and serial publications, which have the great advantage of containing up-to-date information from various authors in frequently themed themes.



**DEFINITION**

The periodical, respectively. a periodical press according to Act 46/2000 Coll. means: "newspapers, magazines and other printed matter published under the same title, with the same content focus and uniform graphic design at least twice in the calendar year".

According to ČSN ISO 5127, the serial publication is printed or non-printed, issued sequentially, in part or in part, with a numerical or chronological mark and intended for unlimited continuity regardless of periodicity.

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The periodicals are published at certain predetermined intervals (periodically) and contain individual articles from different authors thematically oriented according to the main orientation of the periodical, which is usually expressed in its title. From the point of view of the target reader, the periodical is intended either for a wider circle of readers or for readers who prefer a given topic.

Among the most famous periodicals are:

- newspapers - they contain up-to-date information, their periodicity is usually 1 day to 1 week,
- magazines - published with a period of one week to six months,
- yearbooks - published once a year.

### 4.1.3 SPECIAL LITERATURE

Special literature includes standards, patents and corporate literature.



**DEFINITION**

Standards can be defined as certain agreements containing technical specifications and other criteria for different materials, products, processes, and services to suit the purpose. These are qualified recommendations, the use of which is voluntary.

---

Patents are documents created in connection with the registration of inventions, discoveries, designs and trademarks and the granting of patents, copyright certificates, etc. These include, for example, patent documents, copyright certificates, industrial and utility designs or certificates, trademarks, applications, etc.

## DEFINITION



The patent is, according to ČSN ISO 690, a patent document in which the specification defining the invention is officially published, used to obtain or enforce patent rights.

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The last type of special literature is corporate literature, which includes, for example, directories, catalogs of trade fairs and exhibitions, catalogs with production programs of companies, corporate magazines as well as annual reports.

## DEFINITION



Corporate literature includes those materials that companies, business organizations, and companies issue to inform the public about their products, services, or activities.

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### 4.1.4 GRAY LITERATURE

Gray literature refers to documents that can not be obtained from a regular distribution network, for example through a book market. Thanks to the development of modern information technologies, however, they are available. They are also published or only electronically and time-made accessible without limitation to all users.

Higher education qualifications, which are individual written work papers that are the basis for obtaining a university degree, academic degree or scientific-pedagogical degree. They are:

- bachelor thesis,
- dissertation,
- rigorous work,
- doctoral (dissertation) work,
- habilitation work.

The research reports contain information on the results of the research assignment. The technical reports contain the materials for production, information on the results of the test operation, the technical-economic study etc.

### 4.1.5 OTHER TYPES OF DOCUMENTS

Other documents may include, for example, legislative documents include laws, statements, directives, regulations. In addition, the image documents include cartographic documents (monolithic, wall, plastic maps, globes, plans, and atlases). Graphics that represent objects, facts or ideas (posters, postcards, photographs, reproductions of artwork, illustrative teaching aids, technical drawings, diagrams, and diagrams) are also included in this group. Audio documents include audio and video recordings, sounds, sounds, soundtracks, gramophone records, sound CDs, tapes, and cassettes, etc. Audiovisual documents are documents recording both sound and images, such as soundtrack, videotape, DVD, multimedia, etc.

## 4.2 Identification of documents

In order to be able to search for documents accurately, internationally comprehensible and internationally applicable document identification systems have been developed. The significance of identification of documents within these identification systems lies in the unambiguous and unambiguous designation of the document, including the identification of its publisher, publisher,

The most important identification systems of today include the following:

- ISBN - International Standard Book Numbering,
- ISSN - International Standard Serials Numbering,
- ISMN - International Standard Music Numbering,
- ISAN - International Standard Audiovisual Number,
- DOI - Digital Object Identifier.

### 4.2.1 ISBN

*ISBN*

ISBN stands for "International Standard Book Numbering". It is the system of international standard numbering of books, which originated in the late 1960s in the UK. The original intention was only the national system, which gradually spread to the world and was introduced also in the Czech Republic since 1989. The center of this system is the International ISBN in Berlin. In the Czech Republic, the highest authority is the ISBN National Agency, which is based and works in the National Library of the Czech Republic. Participation in the ISBN is voluntary and is free of charge.

The basic documents governing the operation of the ISBN system are ČSN ISO 2108 Information and Documentation - International Standard Numbering Books (ISBN) and ISBN23 User Manual.

For uniquely identifying, a 10-digit ISBN is used to uniquely identify books. The following databases are created within the ISBN operation:

- the database of allocated ISBNs for individual national production titles,
- NAK (publisher directory)
- The ISBN of the books reported.

The ISBN has a solid structure where individual ISBNs are separated by a hyphen or space. The ISBN must precede the international book number. The original 10-digit ISBN (ISBN-10) contains the following 4 parts:

- a group identifier, ie a national, geographic, language or another steady group, is assigned by an international ISBN and varies with the productive age of the group,
- the identifier of the publisher or producer is assigned internally within a group specifically established for this purpose by the Agency, its length varies according to the publisher's or producer's productivity,
- the identifier of the title, the length of which is given by the length of the group identifiers and the issuer or the manufacturer,
- check digits.

The new 13-digit ISBN (ISBN-13) then has an extra group at the beginning. ISBN-13 now has the same structure as the EAN-13 barcode, so books like barcodes are listed directly by ISBN.

Using the ISBN in practice:

- booksellers for book orders, stock agenda, etc.,
- libraries for unambiguous title identification in bibliographic and catalog databases, interlibrary loan services, etc.,
- checking own production for publishers of books,
- search for end users (readers) within book catalogs.

### **SOLVED TASK**



Since 1 January 2007, the ISBN (ISBN13) has the same structure as the EAN13 code. Defined clusters of ISBNs are customarily separated by dashes.

#### **Example of ISBN and EAN**

Example 1 (valid from 1 January 2007): The book "Electrotechnical Schemes and Engagement 1"

ISBN 978-80-7300-229-9, EAN 9788073002299

- 978 - barcode prefix
- 80 - identifier for Czech Republic (and Slovakia)

- 7300 - publisher identifier (7300 has been assigned to BEN Publishing Company - Technical Literature).
- 229 - serial number of the publisher's book. It can take values from 0 to 9/99/999 so that the total number of ISBN (EAN) digits is 13.
- 9 - checksum (0 to 9)

Example 2 (valid until December 31, 2006): The book "We Solve Electronic Circuits"

ISBN 80-7300-125-X, EAN 9788073001254

- 80 - identifier for Czech Republic (and Slovakia)
  - 7300 - publisher ID (see Example 1)
  - 125 - serial number of the publisher's book (here: from the 1000 serial number series). It can take values from 0 to 9/99/999 so that the total number of ISBNs is 10.
  - X - checksum (0 to 9 or X)
- 

## 4.2.2 ISSN

### ISSN

ISSN abbreviation from the English "International Standard Serials Numbering" and is an international standard numbering system for serial publications that originated in the late 1960s in the US. In the Czech Republic, it was introduced around the beginning of the 1970s. The ISSN's top governing body is the ISSN International Center in Paris. In the Czech Republic, the Czech National Center ISSN is the governing body of the State Technical Library in Prague. The allocation of ISSNs is voluntary. The ISSN consists of eight digits, two four-digit numeric groups, among which is a hyphen. The international number must be preceded by ISSN. The ISSN abbreviation is separated from the first digit by a space. Prior to the ISSN, a two-letter country code, such as CS, can be entered. The use of ISSN in practice is, according to the National Technical Library, as follows:

- ISSN can be used in quotes from professional journals,
- the ISSN is used as an identification code for the need for computer processing, searching, and transmission of data,
- ISSNs use libraries to identify and order magazines, for interlibrary services and union catalogs,
- ISSN is an essential element for effective electronic delivery of documents,
- You can generate a GTIN 13 barcode for the distribution of periodicals from ISSN.



### 4.2.3 ISMN

ISMN is an abbreviation derived from the English "International Standard Music Numbering" and is an international standard numbering system for music, which has existed since 1995. *ISMN*

According to the National Library of the Czech Republic, the ISMN system in the Czech Republic has been in operation since 1996. The system originated from the success of the ISBN system and is intended for a specific type of publications - printed music. At present, 60 countries are registered in the ISMN system.

### 4.2.4 ISAN

ISAN stands for English Standard International Audiovisual Number. It is an identifier that uniquely, permanently and globally identifies the audiovisual work and its expressions. *ISAN*

The structure of the ISAN is made up of 16 hexadecimal digits (using digits 0-9 and six letters of the Latin alphabet A-F). ISAN is divided into two basic segments:

- segment tribal, it consists of 12 hexadecimal digits (the letter R = Root in the model number),
- a segment consisting of 4 hexadecimal digits is a segment for identifying an episode or part of a serial audiovisual work (see E = Episode in Model Number).

### 4.2.5 DOI

DOI is the abbreviation of the English Digital Object Identifier and is a digital object identifier that is unique and still assigned to a digital object. DOI identifies only one entity. This identifier is machine-readable and allows for easy communication between different systems. DOI makes it easier to work with digital objects from the point of view of intellectual property. The use of DOI is now commonly used to allocate a unique identifier to journal articles in their electronic versions. Generally, DOI can be used for any objects located on the network. The method of allocation is directed by individual registration organizations, which are overseen and managed by the International DOI Foundation. *DOI*

As [crossref.cz](http://crossref.cz) states, DOI serves primarily to redirect to the current URL. While the URL changes with the move to another server, the DOI remains the same. DOI may contain other identifiers (eg, ISBN, ISSN), which also serve as unique identifiers for scientific work.



## SOLVED TASK

### An example of working with DOI

ZHU, Yanmei, Xinhua WITTMANN and Mike PENG. Institution-based barriers to innovation in SMEs in China. *Asia Pacific Journal of Management* [online]. 2012, vol. 29, no. 4, pp. 1131-1142 [vid. 2013-10-30]. ISSN 0217-4561. DOI: 10.1007 / s10490-011-9263-7. Available from: <http://search.proquest.com/docview/1140922040?accountid=17203>

A document that has a DOI can be found easily, just enter the string <http://dx.doi.org/>

So, we'll look up the article on the web by inserting the following URL into the web browser: <http://dx.doi.org/10.1007/s10490-011-9263-7> and redirecting directly to the article that is at <https://link.springer.com/article/10.1007%2Fs10490-011-9263-7>

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## 4.3 Working with Documents

Working with documents is crucial from the point of view of providing information, which basically involves joining the following two processes:

- input processing (storing information), receipt of documents and creation of their descriptions,
- output processing (information retrieval), receipt of an information request, creation of a query and comparison of the query with document descriptions.

In Vaněk (2013), the document description includes two levels:

- an identification or name description that contains formal information, such as the name of the author, the year of publication or the publisher,
- the content of the document.

### 4.3.1 CHARACTERISTICS OF DOCUMENT CONTENT

The content of the document is the given issue (topic) that the document deals with. Of course, the document can also deal with several different themes. In these cases, it is necessary to distinguish the main topic from the side. The content of the document can be characterized in the following ways:

- description of the content in a natural language (annotation and paper, etc.),
- the use of individual natural language terms or numbers or alphanumeric strings (material selection language),

**DEFINITION**

According to Vaněk (2013), the bibliography is a theory, activity, and technique identifying and describing documents. It is a secondary source of information containing structured bibliographic descriptions of information objects (documents or parts thereof), description of documents (or parts thereof) through bibliographic information. Bibliographic information is a type of secondary information representing a document or part thereof. The result of the document description and the base unit is a bibliographic reference.

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The bibliographic element is the smallest logical unit of data reported in the bibliographic description, eg author, title, place of publication, ISBN, etc.

A bibliographic record is a record containing a bibliographic description. Contains the data required to represent the primary document. It is the result of an analysis of a document that deals with both the formal features of the document and its contents. It is intended for communication of information, therefore it must comply with national and international standards (ČSN 01 0195 - Bibliographic and Cataloging record).

Bibliographic record structure:

- inventory (author, the title of the document),
- the data (date of approval, defense or effectiveness),
- location data (signatures),
- descriptive data (additional authors, publisher, scope, ISBN, ISSN),
- content characteristics (annotation, paper),
- service data (incremental number).

In terms of content characteristics, the role of annotation and report usage plays a key role. Rules for creating annotations and papers are given in CSN 01 0194 - Report and annotation.

**DEFINITION**

The annotation has an explanatory or recommending character, its length is usually up to 500 characters. It is featured in secondary documents, may be part of the primary document. Annotation is a brief feature of the document in terms of content, design, form and other features.

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**DEFINITION**

The report has a maximum length of 2500 characters, the usual length is about 1000 characters. The report does not only cover the topic of the document but also the basic information about its content.

---

The following curriculum is used for a report:

- the subject, subject, nature, and purpose of work,
- methods used,
- results,
- conclusions,
- area of use.

### 4.3.2 RELEVANCE OF THE DOCUMENT

When searching for necessary information in documents, it would be ideal if only all relevant documents from the fund were found and none were irrelevant. But this is not common practice because in most cases it is not possible to get all the relevant documents. It is, therefore, necessary to verify the documents you are looking for whether they are relevant to the queried search query.

The document is relevant to Vaněk (2013) if it meets the information requirement. For the quality of the information source, it is essential to:

- the most accurate definition of relevant information for the resource;
- getting the most relevant and as irrelevant information as possible.



**DEFINITION**

Relevance can be understood as the importance, the severity, the factual affinity for the applied dose. Information relevant to the issue is relevant). Relevance is the consistency of the selected information object (document) with the information required.

---

The relevance of information is contextually variable. According to Vaněk (2013), we can talk about three types of relevance:

- formal, formal-level logic, searching for the code of the query (selective image) of the query with the document's selection code, determining the search program;

- substantive, at the semantic level, the relation of the relative proximity between the content of the document and the information query is sought; the content relationship between the information and the requested requirements is determined by the researcher, user;
- pertinence (personal), at pragmatics level, characterizes the relation of meaningful proximity between the content of the document and the information need, the content relationship between the information and its needs is determined by the user.

### 4.3.3 CITATIONS OF DOCUMENTS

Quotation generally refers to the introduction of a shorter part of another text or statement, usually literal (direct quote) or taken over and modified (indirect quote). There are a number of citation standards for document quoting. It is essential that we use consistently one chosen citation standard throughout the work and do not combine, for example, more norms altogether.

Czech Republic:

- citation standard ČSN ISO 690: 2011 - Bibliographic citations.

International citation standards:

- Harvard style,
- Chicago style,
- Vancouver style,
- IEEE.

In addition to the above-cited examples of citation standards, the citation is often governed by guidelines and guidelines, for example, in the case of Czech universities. In the framework of the OPF, the Dean's Instruction No. 7/2015 for the Modification, Publication, and Storage of Higher Education Qualifications, which contains a pattern of writing bibliographic citations in a university qualification work elaborated at SU OPF, is crucial.

What are the most common offenses against citation ethics? The most serious offense against the ethics of scientific work is the non-quoting of the work that the author used. It is also an inaccurate citation, a citation of a work that was not used at work, and a quote of own works that are not related to a new work (so-called auto citations).

#### FOR THE INTERESTED



There are a number of online services to work with citation standards, where you can create and manage your quotes.

Once you have signed in to <https://www.citace.com/>, you can store your quotes to keep them up-to-date and reuse them at any time in your professional work. This service supports the current version of ISO 690. The Web and Catalog <https://www.mzk.cz/> allows you to search for a book and automatically generate a quotation according to one of the 10 available citation standards. Zotero ([www.zotero.org](http://www.zotero.org)) is a useful citation management application. This is a standalone application for which you can install extensions for individual web browsers (Chrome, Firefox, Safari)

If you are interested in more information on individual bibliographic citation methods, then visit the following e-book on the topic:

[https://is.muni.cz/do/rect/el/estud/prif/ps11/metodika/web/ebook\\_citace\\_2011.html](https://is.muni.cz/do/rect/el/estud/prif/ps11/metodika/web/ebook_citace_2011.html)

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## 4.4 Location of Objects

As part of the placement of digital object objects, we will deal with the following systems: Handle system and Crossref system.

### 4.4.1 HANDLE SYSTEM

**Handle  
System**

The Handle System (<http://www.handle.net>) was established and developed and managed by the CNRI (Corporation for National Research Initiatives). This is a tool for detecting the current placement of digital objects. This is, in essence, a register in which are stored:

- DOI,
- URL,
- Metadata describing the digital object.
- possibly the formats in which it is published (HTML, PDF, XML).

Bratková (2007) presents the following elements of the Handle system:

- protocols - provide routing of the institution or organization assigning the Handle identifier and the exchange of authentication information for data management operations linked to the identifier,
- a defined namespace,
- reference software - provides the necessary system processes.

The structure of the identifier is, as stated by Bratková (2007), consisting of two parts separated by a slash:

- Prefix - The Handle Naming Authority (NA) - The numerical prefix identifying the institution allocating the identifiers are assigned by the Global Handle Service and is currently comprised of a decimal numeric notation where the character (.) Is used to express the path in the NA hierarchy (read from the left transport).
- Suffix - Handle Local Name - the suffix identifying the name of a particular digital object is assigned by the institution (NA) and must be expressed by Unicode 2.0 encoding (UCS-2, Unicode, version 2.0).

The Handle system allows, as stated by Vaněk (2013), to redirect the user to a preferred data format or server. The use of DOI is the basis for the interconnection of digital objects through quotations within the collaboration of publishers who are members of the CrossRef (DOI resolver) system.

#### 4.4.2 CROSSREF SYSTEM

CrossRef System (<http://www.crossref.org>) is the most important DOI registration agency. This system was put into operation in 2000 by the non-profit and independent Publishers International Linking Association (PILA). This system allows links to bibliographic references in scientific journals using DOI and is used to link quotes across publishers. Just starting up this network has begun to address the issue of invalid hyperlinks when referring to documents located on the Internet. Through CrossRef, publishers can directly interact with their online documents through bibliographic quotes. Another advantage is that publishers can refer to their articles in journals to quoted articles published by other publishers located on other servers. Very effective is the use of DOI, which facilitates the management of information resources, because when you change the location of a digital object, it is not necessary to make edits (address changes) in quotes or in databases.

CrossRef  
System

#### QUESTIONS



1. What are electronic documents dependent on?
2. Name the basic types of books.
3. Among the most famous periodicals are:
4. What documents are included in special literature?
5. Define the term gray literature.
6. What do you know about today's most important identification systems?
7. What is the structure of the bibliographic record?
8. What types of relevance do you know?



## SUMMARY OF CHAPTER

Document any item that has been printed or otherwise and can be cataloged or indexed. The most well-known types of documents include books, periodicals, and serial publications, special literature, gray literature and other kinds of documents. The most important identification systems of today include the following:

ISBN - International Standard Numbering, ISSN - International Standard Numbering, ISAN - International Standard Numbering, DOI - Digital Object Identifier.

The bibliography is a theory, activity, and technique that identifies and describes documents. Bibliographic information is a type of secondary information representing a document or part thereof. The result of the document description and the basic unit is the bibliographic data. The bibliographic element is the smallest logical unit of data reported in the bibliographic description, eg author, title, place of publication, ISBN, etc.

In terms of content characteristics, the role of annotation and report usage plays a key role. The annotation has an explanatory or recommending character, its length is usually up to 500 characters. The report has a maximum length of 2500 characters, the usual length is about 1000 characters. The report does not only cover the topic of the document but also the basic information about its content.

Relevance can be understood as the importance, the severity, the factual affinity for the applied dose. Information relevant to the issue is relevant). Relevance is the consistency of the selected information object (document) with the information required.

Quotation generally refers to the introduction of a shorter part of another text or statement, usually literal (direct quote) or taken over and modified (indirect quote). There are a number of citation standards for document quoting.

The following systems are important for the placement of digital objects: the Handle system and the Crossref system.



## ANSWERS

1. The technical means, the standards of the environment used, the software tools necessary to access their content.
2. Monographs, proceedings, textbooks, college scripts, encyclopedias, dictionaries
3. Newspapers, magazines, yearbooks
4. Special literature includes standards, patents, and corporate literature.
5. Gray literature refers to documents that can not be obtained from a regular distribution network, for example through a book market



6. ISBN, ISSN, ISMN, ISAN, DOI
  7. Inventory data, earmarked data, location data, descriptive data, occupational characteristics, service data.
  8. Formal, factual, pertinent (personal)
-

## **5 SOURCES OF INFORMATION, ACQUISITION, SEARCHING, AND MANAGEMENT OF INFORMATION**



### **QUICK REVIEW OF CHAPTER**

There are currently very diverse sources of information. Historically, libraries and archives are the most well-known source of information. Furthermore, museums and galleries are also available. From modern sources, attention will be paid to information centers and centers, databases, special institutions and electronic information sources. The possibilities of obtaining information are therefore greatly facilitated and accelerated by the information technologies, thanks to a wide variety of sources of information and faster than when the acquisition of information required much more effort and often costs. Finding information is another topic of this chapter. There are a number of methods, techniques, procedures, interesting information resources, services and applications for information retrieval. A web search will also mention the usability of the site. The final part of the chapter is devoted to the issue of information management.

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### **OBJECTIVES OF CHAPTER**

After studying this chapter, you will be able to:

- provide the most important sources of information,
  - know how to get information from a variety of sources,
  - know how to effectively search for information,
  - know how to manage information.
- 



### **TIME REQUIRED TO STUDY**

The time needed to study this chapter is about 5 hours.

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### **KEYWORDS OF CHAPTER**

Sources of information, retrieval, search and management of information

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## 5.1 Sources of information

Historically, libraries and archives are the most well-known source of information. Furthermore, museums and galleries are also available. From modern sources, attention will be paid to information centers and centers, database centers, special institutions and electronic information resources.

### 5.1.1 LIBRARIES

Libraries are historically the oldest institutions that collect different types of documents and also provide various information services. The oldest libraries are mentioned in ancient times (for example the Alexandrian Library from the Age of Ancient Egypt).

*Libraries*

The Czech Republic boasts the densest library network in the world in terms of a number of libraries per inhabitant. This is evidenced by several research. According to The New York Times (2016), there is one library in the Czech Republic for every 1,971 inhabitants - and that is when counting on the population four times the European average and even ten times more than in the United States. According to the magazine Week (2017), the Czech Republic has the densest network of public libraries across the European Union. There are 63,000 public libraries throughout the Union, with the Czech Republic being 5408. For the 10,000 inhabitants of the Czech Republic, there are 5,1 libraries, the EU average is 1,3 libraries per 10,000 inhabitants. Nevertheless, there is a clear trend that the number of libraries was previously higher and is now falling. According to NIPOS (2015), 6179 libraries, 2000 - 6019 libraries, 2005 - 5920 libraries, 2010 - 5415 libraries, 2014 - 5360 libraries were in 1995.

#### **DEFINITION**



For example, a library can be defined as a cultural, information and educational institution that collects, processes and stores an organized collection of documents. Further definitions by Nedomová et al. (2007) defines the library as a selected and organized document pool for a particular target audience.

According to Vaněk (2013), the library is a facility in which all are provided, without distinction, by public libraries and information services in a way that guarantees equal access and which is recorded in the libraries.

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Libraries provide their readers and the public with various types of information services. In addition, the following major services will be mentioned in greater detail:

- borrowing,
- study analysis activity,

- search services,
- reference information services,
- consultation services,
- bibliographic services,
- reprographic services.

Most of the library combines with the lending service, which gives the registered clients the opportunity to borrow the necessary documents from the library. We distinguish the borrowing services from the fund of a given library into two basic services:

- Absent when the user takes a borrowed document (book, magazine, or another document).
- The attendance when the document (book, magazine) is lent to the student only for study while staying in a reading room or study room.

Many libraries also offer interlibrary loan services within the Czech Republic, including international borrowing. The main purpose is to mediate lending of a document from a Czech or foreign library in cases where the given library does not own the library in its library. These services are typically charged, whether postage or administrative charges. All conditions (price, borrowing time) are determined by the library that lends the document.

Studying analysis activity is a service that deals with the factual content of documents. The result is different forms of study-analysis work and, as a standard, it is a service that may be requested by users of the library. Scope of service may range from a simple lift from one book to a very demanding and detailed study of a whole range of books, articles, research, market developments,

The Search Service is another important library service to find out what has already been published on the topic. The search is then a tag for the actual process of searching for available information on the subject, as well as the result of that search. The scope of the search query is important, which is defined, for example, by the given topic, the time limit, the language, the type of the analyzed documents. The search of the text is then created by an inventory of the subjectively most important points and ideas of the analyzed text. The aim is to create a brief overview to quickly understand the topic being studied. It is distinguished from a retrospective (one-off) search to create a one-shot view of what was already created on the subject prior to the date of the assignment, and another type is a recurrent (periodic, incremental) search that tracks new information at a certain interval.

The Reference Information Services have the task to convey certain information and to include various inquiries regarding library services, catalog search, document lending, booking, but also the availability of sources and sources, the provision of bibliographic and factual information.

Consultation services provide the possibility for users to obtain help from the library on the basis of queries in various forms (written, electronic, telephone, oral, etc.). Queries may be of a different nature from information funds and services through the general availability of the information sought.

Bibliographic services provide bibliographic information, which is a set of data on cited works such as a list of used literature or electronic resources. This information allows the identification of documents.

Reprographic services make it possible to obtain a copy of the required document or part thereof. Copying must be done in accordance with copyright law.

Library system in the Czech Republic according to the Library Act (Act No. 257/2001 Coll.)

- libraries set up by the Ministry of Culture of the Czech Republic (NK, MZK, Library, and Printer for the Blind by K. Macan)
- regional libraries - established by the county
- basic libraries (local) - run by municipalities
- special libraries - such as college libraries

#### Important Czech Libraries

- National Library of the Czech Republic
- National Technical Library
- The Moravian Regional Library
- The Strahov Monastery Library
- Jiří Mahen Library in Brno
- Library of the Academy of Sciences of the Czech Republic
- The Scientific Library in Olomouc
- The Municipal Library in Prague
- National Medical Library
- Library and Printer for the Blind by K. E. Macan
- Pedagogical Library of J. Komensky

#### Major foreign libraries:

- Library of the British Museum in London
- Congress Library in Washington
- Nationalbibliothek in Vienna



## FOR THE INTERESTED

### SU OPF Library

"After a major reconstruction, the library was opened on December 15, 2009, in the Vyhlička university area. The library has 55,000 library units focused on the faculty's fields of study. In addition to professional literature and study materials, the study studio offers 133 prestigious journals, the possibility of printing, copying, and scanning. There are bachelor's, master's and doctoral theses, databases on CD-ROMs, tutorials and audio cassettes. Since 2001, the parts of the study room and university work have been made available to digital users. "

Source: <http://www.slu.cz/slu/cz/univerzitni-knihovna/pracoviste-karvina/o-nas>

The SU OPF Library offers an extensive portfolio of the following services:

- borrowing services,
- interlibrary service,
- search,
- information education,
- reprographic services,
- consultation, counseling,
- reservation of documents,
- request for access to final works.

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### 5.1.2 ARCHIVES

#### Archives

The meaning of the word is constantly evolving. The designation of the archive comes from the ancient Greek word *archeion*, which was called the so-called government house. It was a government building where public documents were kept.



## DEFINITION

Act No. 499/2004 Coll., On archiving and filing service, defines the term archive of a facility according to this Act, which serves as the storage and care of archival records.

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The basic functions of the archive can be summarized as follows:

- selection and acquisition of archive materials,
- systematic processing of archive materials,
- archival records,
- Safe storage and access to archive documents.

Archives are broken down as follows:

- public archives,
- private archives.

Public archives are further broken down as follows:

- national Archives,
- security Component Archive,
- state regional archives,
- specialized archives,
- security archives,
- archives of territorial self-governing units.

### 5.1.3 MUSEUMS, GALLERIES

#### DEFINITION



#### Museum

Pursuant to Act No. 122/2000 Coll. on the protection of collections of a museum nature and on the amendment of some other laws, the Museum of the Institution, which acquires and collects natural and human creations for scientific and educational purposes, examines the environment from which natural and human creations are obtained, collects from selected natural resources and human creations permanently preserves, records and professionally processes, allows a way to guarantee equal access to all without distinction of their use and accessibility through the provision of selected public services, the purpose of which is not, as a rule, to achieve profit.

Galeria is a museum specializing in collections of fine arts.

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The collection of museum nature is then such a collection that is important for prehistory, history, art, literature, technology, natural or social sciences.

According to the list of methodological explanations for the „Kult (MK) 14“ for the purposes of the annual museum and gallery statement, the museum, monuments, and galleries are classified according to the predominant subject of collections and exhibitions:

- 01 Fine Arts
- 02 Other arts
- 03 Archeology and history
- 04 Nature history and natural sciences
- 05 Science and Technology
- 06 Ethnography (ethnology) and anthropology
- 07 General, combined (homemade)
- 08 Open-air museums
- 09 Others



### **FOR THE INTERESTED**

List of museums and galleries: In the year 2016 there were about 490 museums, galleries (museums of fine arts) and monuments (museums) in the Czech Republic. The overall list of museums and galleries operating on the territory of the Czech Republic would be very extensive and therefore specialized portals could be recommended for search.

National Museum in the Czech Republic, a signpost between Czech museums (<http://www.museum.cz/>) is available at Museum.cz - museums in the Czech Republic, including detailed information. You can also search the portal of the Association of Museums and Galleries of the Czech Republic (<http://www.cz-museums.cz/adresar/>), which is a professional association of museums and galleries in the Czech Republic and people working in the field of museums.

Visiting individual museums and galleries can be traced through the National Information and Counseling Center for Culture (NIPOS), which provides, under the authority of the Ministry of Culture of the Czech Republic, a state statistical service for culture on the basis of Act no. 89/1995 Coll., As amended ([http://www.nipos-mk.cz/wp-content/uploads/2013/05/MUZEA\\_navstevnost\\_2016.pdf](http://www.nipos-mk.cz/wp-content/uploads/2013/05/MUZEA_navstevnost_2016.pdf), <http://www.nipos-mk.cz/?cat=126>).

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#### **5.1.4 INFORMATION CENTERS AND CENTERS**



### **DEFINITION**

According to Vaněk (2013), information centers (information centers) are institutions or specialized institutions of institutions that collect, process and make available information about a particular municipality, city, region, organization, project, field, etc.

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Information centers may be for the general public or for the interest groups of the clients. The founders of these centers may be state and public authorities, institutions of various kinds, etc. In terms of services provided, complex services, including library services, are often available. From the point of view of the form of the services provided, it may include oral information, the provision of printed materials, audio and video media as well as the Internet.

Specific examples of information centers and centers:

- **The Government Information Center** (<http://icv.vlada.cz/>) provides information on the activities of the Czech Government, its advisory and working bodies and the activities of the Office of the Government of the Czech Republic. There are, for example, information on ongoing and ongoing reforms (pension, health, social, tax, etc.), anti-corruption measures,
- **The National Youth Information Center** (<http://www.nicm.cz/>) is one of the departments of the National Institute of Children and Youth. Provides free information from education in the Czech Republic and abroad, travel, leisure, social-pathological phenomena, citizens and society, youth in the EU, etc.
- **Aviation Information Service** (<http://lis.rlp.cz/?lang=en>) is the organizational component of Air Traffic Control of the Czech Republic, s.p. It provides the information necessary for the safety, regularity, and economy of international and national air traffic within the scope of its competence.
- **Tourist services** offer a range of information services to all cities in the Czech Republic and major tourist centers. For example, the Prague Information Service (<http://www.praguewelcome.cz/>)

### **5.1.5 DATABASE CENTERS**

Database centers are institutions (often in virtual form) that provide access to information funds. Their goal is to offer, produce and mediate access to professional and business databases. The business model is based on the principle that they buy from the information database producers in the form of licenses for their on-line displaying, searching and providing their content in the form of individual data, bibliographic, factual information, annotations, abstracts or full texts. Access is currently mostly via the Internet and is often charged in the form of different licensing accesses to the system.

Types of databases:

- bibliographic databases,
- factual databases,
- full text (full text) databases,
- database of catalogs, registers, directories.

Examples of specific Czech services:

- Albertina Praha (<http://www.aip.cz/>) is a supplier of foreign electronic information resources for science, research, education, and entrepreneurship.
- The Albertina Marketing Database (<http://www.albertina.cz/>) allows you to search for all types of information including user notes and scheduled events.

Examples of specific international services:

- The DBC Dialog (<http://www.dialog.com/dialog/>) belongs to the US company ProQuest and is the largest information society in the world. It accesses over 900 different databases from all fields of human activity.
- Swiss DBC DataStar Dialog (<http://search.proquest.com/professional/login>) offers a specialized collection of databases mainly from the field of pharmacy, biomedical and healthcare, natural sciences, engineering, computer science.
- DBC Dialog Profound (<http://www.profound.com/>) is a service focusing on marketing, business-economic, analytical and prognostic information as well as intelligence and journalistic information.
- EBSCO Publishing (<http://www.ebsco.com/index.asp>) is aimed at covering the information needs of researchers.
- GENIOS Deutsche Wirtschaftsdatenbank - GBI is the most prestigious German DBC, focused on information from the German business and corporate sphere, politics and education.
- LexisNexis (<http://www.lexisnexis.com/en-us/Home.page>) is the world's leading DBC in the US. It focuses mainly on legislation, law enforcement, risk management, corporate and government issues, accounting, and academic markets.

### **5.1.6 SPECIAL INSTITUTIONS**

The special institutions include the Office for Technical Standardization, Metrology and State Testing and the Industrial Property Office.

#### **THE OFFICE FOR STANDARDIZATION, METROLOGY, AND TESTING**

The Office for Technical Standardization, Metrology and State Testing (<http://www.unmz.cz/urad/unmz>) was established by the Act of the Czech National Council No. 20/1993 Coll. on securing state administration performance in the field of technical standardization, metrology, and state testing. UNMZ is an organizational component of the state in the Ministry of Industry and Commerce of the Czech Republic. The Office exercises state competence in the following areas:

- technical standardization,
- metrology within the scope stipulated by Act No. 505/1990 Coll.,
- testing to the extent stipulated by Act No. 22/1997 Coll.,
- harmonization of technical regulations.

## OFFICE OF INDUSTRIAL PROPERTY

The Industrial Property Office (<http://www.upv.cz>) is the central body of the state administration of the Czech Republic for the protection of industrial property. It fulfills, in particular, the function of the Patent and Mark Office. Its core functions include:

- decides, within the framework of administrative proceedings, to provide protection for inventions, industrial designs, utility models, topographies of semiconductor products, trademarks, geographical indications and designations of origin,
- performs activities under patent agents,
- obtains, processes and makes available the World Patent Fund,
- ensures the fulfillment of obligations under international industrial property treaties to which the Czech Republic is a member;
- actively participates in cooperation with other state administration bodies in the enforcement of industrial rights,
- cooperates with international organizations and national authorities in the field of industrial property.

### 5.1.7 ELECTRONIC INFORMATION SOURCES

A very important and utilized resource is today an electronic information resource that plays an irreplaceable role in obtaining a quick overview of the issue from the point of view of current and older published information. New information is often published first through electronic information sources, and then, with some time delay, they are also published in a standard printed version. In working with these resources, it is necessary to focus only on serious, verifiable and scientific electronic information sources.

*Electronic  
informa-  
tion  
sources*

#### **DEFINITION**



According to the National Technical Library (NTL), the electronic information resource is characterized as "an information resource that is kept in electronic form and is available in computer network environments or other digital data distribution technologies."

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According to Gala, Pour and Šedý (2015), electronic information sources include all sources of information in electronic form, accessible either freely on the Internet or in the form of paid services via professional on-line dialogues but also off-line, independent of the Internet, for example on optical media.

## **DIVISION OF ELECTRONIC INFORMATION RESOURCES (EIR)**

To get a basic orientation in the EIR world, categorization is used. The division according to the level of information processing as stated (Fiala, 2007) is as follows:

- bibliographic - bibliographic information on published journals, conference papers, books, etc.,
- factographics - text, numeric or combined information (statistical data, directories, catalogs, registers),
- full text - Full texts of original documents that allow you to search by text strings.

In addition, EIR can be divided according to the type of information provided:

- primary - original information and data (factual databases, full-text database, etc.),
- secondary - Information sources describing primarily documents (bibliographic databases, library catalogs, etc.),
- tertiary - sources containing primary information on the existence of secondary information sources (catalog databases, web directories, etc.).

EIR in terms of technical disclosure:

- offline access to EIR (the user is not connected directly to the network),
- online access to EIR (the user is connected directly to the network and communication is thus directly in real time).

EIR in terms of the thematic and field division:

- resource-specific resources,
- multidisciplinary resources.

EIR in terms of specific processing technology (Fiala, 2007):

• online catalogs - the catalog used in automated processing where the document is displayed on the screen, can be searched for by multiple criteria (name, author, MDT, etc.)

- online public catalog (OPAC) - public online catalogs,
- database - a set of structured data that makes up a whole in terms of theme or type of stored records,
- an Internet portal - a set of websites designed to mediate the access to selected information sources of a certain thematic focus,
- digital library - a collection of digital objects of various kinds (text, image, audio, multimedia) together with methods for their access to, retrieval, selection, organization, storage; e-books, e-journals.

### Benefits of electronic information sources:

- contain the most up-to-date available information,
- availability for a large circle of users at the same time,
- unlimited accessibility in terms of time (24 hours a day, 7 days a week),
- use is not tied to a specific place and institution,
- using links, you can search for other related resources and documents,
- the ability to search by different criteria,
- personalization of content (user profile settings such as news updates, setting thematic groups, etc.),
- the ability to study multiple sources and documents at one time.

### Disadvantages of electronic information sources

- dependence on computers, the Internet and often electricity,
- in the case of licensed EIZs, the dependence on data providers,
- it is not always a guarantee of lasting access to resources,
- access to valuable information is often limited by restrictions and fees,
- use presupposes a certain degree of information and computer literacy.

### EXAMPLES OF ELECTRONIC INFORMATION SOURCES

In relation to EIR, the primary sources are listed by Perlová et al. (2011):

- e-books,
- full texts of articles from journals, contributions from proceedings,
- full texts of eVŠKP,
- presentations from conferences.

### ELECTRONIC BOOKS (E-BOOKS)

Electronic books are created either by using the original created by the author on a computer in a text editor, and the digital original is then transformed into the final form for the distribution or digitization process (using scanners and OCR technology= Optical character recognition) of the original printed book that does not have a digital original.

#### DEFINITION



According to the TDKIV (Czech Terminology Database of Librarianship and Information Sciences), the following e-book definition is stated:

- Book in digital form, created on a computer or converted to digital form.
- One-purpose physical portable device for easy handling of document text (recording, reading, creating notes, etc.).

- An electronic book is sometimes understood as a book in digital form, issued on a physical medium (for example on a CD/DVD medium).
- 

E-books can be read and viewed on a variety of electronic devices - on a reader, tab, mobile phone or desktop PC or notebook. Very popular are e-book readers (such as Amazon Kindle, PocketBook etc.) that use electronic ink technology to display information.

Ebooks can be purchased for example eReading.cz, Wknihy.cz, Amazon.com, Libri.cz or are free and free of charge for Google Books, Gutenberg, Theses.cz, and others.

There are a number of e-book formats, often depending on the e-book distributor and taken by the manufacturers of the individual types of readers. An overview of the most common e-books is as follows:

- PDF (Portable Document) - an expanded universal format that can contain both text and images. Readable with Acrobat Reader and other PDF browsers.
- TXT - these are text files of a non-graphical format that does not allow images, graphics, editing etc. Among its advantages are mainly small file size and easy portability to other platforms.
- Hypertext HTML also allows you to read e-books in any web browser and displays graphics and images in addition to text.
- MOBI - The Mobipocket with extension is based on the Open eBook standard. Support for XHTML and JavaScript allows for more advanced formatting.
- EPUB - format supported by Adobe. This is an open standard created and promoted by the International Digital Publishing Forum (IDPF), which is based on XHTML - supporting images, fonts.
- PDB - The Palm Media format was one of the most commonly used and allows you to protect books by crypting when the key is provided when you buy a book.
- Kindle with .zw extension - This format uses Amazon Kindle browsers. Based on the Mobipocket standard and provides DRM protection.

### **FULL TEXTS OF ARTICLES FROM JOURNALS, PAPERS FROM PROCEEDINGS**

On-line articles on journals and papers are also available in electronic form. These resources contain current research results in a number of areas. Some resources are freely accessible, others may be charged. References to some specific databases can be found in the section for those interested: available electronic information sources within SU OPF.

### **FULL TEXTS OF eVŠKP**

The access to higher education qualifications (VŠKP) within Czech higher schools takes place on the basis of the eVŠKP system. At present, all public higher education institutions

are selecting higher education qualifications in electronic form, and the number of schools that make the work accessible to the public in accordance with Section 47b of Higher Education Act No. 111/1998 Coll. Silesian University in Opava also publishes VŠKP within the repository of the final qualification work, see the link <https://zkp.slu.cz/?page=login>.

### PRESENTATIONS FROM CONFERENCES

In conferences, contributions that are part of conference proceedings are also presented as part of a conference program in the form of the most often powerpoints presentations. These presentations are in some cases available on the official website of the conference. Sometimes we can also see recorded videos from conferences.

### FOR THE INTERESTED



### Available electronic information sources within SU OPF

Working with paid databases is possible from all computers connected to the Silesian University in Opava and is free of charge for university students and employees, including storing or printing of found records. For access from computers outside the SU network, you need to set up remote access (VPN or VMWare Horizon View, which is used to run a virtual university PC on another device.)

The use of EIZ is governed by the provisions of the applicable license agreements. It is allowed to use electronic resources exclusively for personal study and research purposes. Commercial use is strictly forbidden. Mass downloading of data from individual sources exceeding current personal research needs is considered to be a breach of the license terms and may lead to access blocking.

List of available electronic books within the SU OPF:

- EBSCO eBooks / multidisciplinary
- ProQuest Ebook Central / multidisciplinary
- Ebook Central (ProQuest interface) / multidisciplinary
- Alphabetical List of Electronic Information Resources within the SU OPF:
- Academic Search Complete / multidisciplinary / fulltext
- Business Source Complete / Business / Full Text
- Central Eastern European Academic Source / multidisciplinary / full text
- EBSCO / multiple databases / fulltext and bibliographic
- GreenFILE / Environment / Full Text
- IOPscience (not only physics / full text)
- JIB - Primo Central / collections of e-books, digital archives, catalogs of libraries / fulltext and bibliographic
- Journal Citation Reports / multidisciplinary / citation

- JSTOR / humanities / full text
- Library and Information Science Source - LISS (EBSCO) / Library, Information Science / Full Text
- Library and Information Science Abstract - LISA / library, computer technology / bibliographic
- Library and Information Science and Technology Abstract - LISTA (EBSCO) / library / bibliographic
- Literature Online / literary texts / full text
- Literature Resource Center (Gale) / Literary Science and Literature / Full Text and Bibliography
- Doctoral Gate Library and Information Science - KIV / Library, Information Science / Full Text and Bibliography
- OECD iLibrary / socio-economic, static data / full text
- ProQuest / multiple databases / full text and bibliographic
- ProQuest Central / multidisciplinary / fulltext
- Regional Business News / Business / Full Text
- ScienceDirect / Economics, Biology, Informatics, Art and more. / full text
- Scielo Citation Index / science, art, social sciences and humanities / bibliographic + citation
- Scopus / multidisciplinary / bibliographic + citation
- SpringerLink / multidisciplinary / fulltext
- Web of Science / multidisciplinary / bibliographic

Used resources: [http://www.slu.cz/slu/cz/univerzitni-knihovna/pracoviste-opava/fondy/electronic\\_information\\_sources](http://www.slu.cz/slu/cz/univerzitni-knihovna/pracoviste-opava/fondy/electronic_information_sources)

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## **SELF WORK**

- Complete a research on "Developing CZK / EUR for the last 5 years", sources in English.
  - Compare the prices of the interlibrary borrowing service of SU OPF and the Library of Science in Ostrava.
  - What are electronic information resources available for students and employees of Silesian University in Opava?
  - Find out what are the museums in the Moravian-Silesian Region on the territory of the former district of Frýdek-Místek.
  - Find out the traffic of the Tatra Technical Museum, incl. the exhibition of Dana and Emil Zátopak in Kopřivnice for the last 3 years.
-



## 5.2 Acquisition of Information

The possibilities of obtaining information are nowadays facilitated and speeded up by the information technology, compared to the past, when the acquisition of information required much more effort and often costs. It is important to obtain information that is useful and usable. Leaders should be able to effectively use the information and create a system for their processing. The resources for the acquisition can be divided into external and internal resources.

*Acquisition of Information*

External information retrieval includes a variety of external resources, such as public registers, databases, printed matters, professional periodicals, television, professional seminars and conferences, training, promotional materials and, of course, the Internet as well. The information obtained may be of a different nature, such as general, technical, economic, legal, etc.

In the case of internal resources, these are, in particular, internal documents that have been created by self-employed workers (business consultants, designers, economists, personnel managers, etc.) and must be archived and provided to co-workers. They have different forms - news, reports, reports, etc. Some information is only internal in nature and subject to confidentiality, other information, on the contrary, is mandatory and in the prescribed form. It can be company accounting, audit, work safety, statistical reports for the state statistical office, technical and hygienic certificates of goods, etc.

## 5.3 Searching for information

The search for information is very extensive. There are a number of methods, techniques, techniques, interesting information resources, information services, and applications. At the beginning of each search, there is always a so-called information need or a lack of information to solve a problem.

*Searching for information*

If you formulate your need, it becomes an information requirement. When it becomes a subject of the search, it is called a search query, and once you have expressed it in a particular query language, we are talking about a search query. The search is the result of a search, which is a list of bibliographic records, factual information or full texts of documents that correspond to the information required. You usually search by yourself, but you can also order it.

### **DEFINITION**



According to Vaněk (2013), a search is made to find out if the text you are typing contains the words you are looking for, we will call them samples. If the entered text contains the samples you are looking for, we are also interested in the information about where the sample contains the sample.

The subject catalog, according to Vaněk (2013), is a set of manual links to various sources. This creates a tree structure that in its own way creates something like a content or index of an information resource. Links are clearly categorized into thematically relevant categories, enabling fast, efficient, and accurate searches.

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### **5.3.1 SEARCH FOR INFORMATION ON THE INTERNET**

Search options on the Internet are considerable. Information can be found not only in text but also in pictures, videos, maps, etc. In order to gain access to public or non-public information sources, we have a variety of search tools. The search tools include:

- subject catalogs,
- search engines,
- metaverse,
- virtual libraries.

For effective search, a wide range of Internet search engines are currently being used. In addition to the world's most widely used Google search engine, there are, of course, others such as Bing, Yahoo, Altavista. In the Czech Republic, for example, List, Jyxo etc. Google has an absolutely dominant position and leads sovereignly among online search engines in almost all countries of the world. Among countries where there is strong local competitions are eg Russia (where Yandex is first), China (Baidu), Japan (Yahoo) and South Korea (Naver) and Czechia (Seznam.cz).

#### **SEARCH OPERATORS**

Search operators are characters with special meaning for full-text search engines. Most search engines apply a set of general operators to specify the conditions that the search query (content) should meet.

**Quotes ("" )** - Accurate match with embedded expression. So if you enter a few words in succession, the search engine will search them primarily in the order in which you entered them.

Example: "MFK Karviná"

**Minus (-)** - Negative operator. If you use it before any phrases or in conjunction with other operators, you exclude that part of the query from the search results you are looking for.

Example: MFK Karvina -site: mfkkarvina.cz

**Site** - Search results from a specific domain. Through this operator, you can also check the number of indexed listings by the search engine in addition to searching only on that domain.

Example: site: fotbal.cz tickets

**InTitle** - Search for a given term in the page title.

Example: intitle: SEO

**InUrl** - Search for a given term in the URL of a site.

Example: inurl: / repre-tickets /

**InText** - Search for a given term in the content of the pages.

Example: intext: anything

**FileType** - search by file type specification. Returns only output files that meet the specified suffix criterion.

Example: MFK Karvina filetype: pdf

Search operators are the foundation of every good and effective web search. Advanced search knowledge can greatly reduce the path to the desired answer. Next, we will focus on Google search operators.

## GOOGLE SEARCH OPERATORS

Below are examples of search operators that can be used to search on Google.

**Two dots (..)** - means range (price or some other unit)

Example: soccer ball 1000..2000 CZK

**An asterisk (\*)** is a placeholder that tells the search engine that it can replace it with any phrase.

Example: football \* school

**Related** - Using this operator, you can search for a domain of similar meaning or somehow bound to the domain. It can serve to find competition or similar content.

Example: related: fotbal.cz

**Link** - Used to get examples of some referral domains on your domain.

Example: link: fotbal.cz

**OR** - "Or" or logical sum. When used, the search engine considers an option that is placed before the operator and the possibility of the same weight behind it. It is necessary to put it in capital letters.

Example: (MFK OR FC) Karvina

**Cache** - View the latest Google cache entry of the URL (if available). This is useful, for example, if the site does not run at that time. For use, here is the option to display the page as text only.

Example: cache: fotbal.cz

**Info** - a Google signpost that gives you basic URL info and the ability to view similar pages, cache versions, links to that page, etc.

Example: info: fotbal.cz



### **FOR THE INTERESTED**

Google has an advanced search that represents a part of the operators and you can use it at URL: [http://www.google.com/advanced\\_search](http://www.google.com/advanced_search)

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### **SELF WORK**

- Find out what are the prices for 3 + 1 apartments in Karviná
  - When will the next eclipse of the Sun be closest to the Czech Republic?
  - Find the price of tickets for the next World Cup?
- 

### **USABLE WEB**

Generally, a usable site is a site that allows its users to find the required information, read the news, register, order goods, etc. Sites and sites that do not meet these basic usability requirements then lose their visitors because users are leaving elsewhere to avoid having to waste time with the unnecessarily complicated search for information and not to look like "idiots" who can not find the information they need.



### **DEFINITION**

According to the website [jakpsatweb](http://jakpsatweb), the good usability of the website is characterized by the fact that the users succeed on the site to do what they want. These activities will then

be done in a reasonable time and without a great deal of thought, and they will lead them without mistakes and fundamental disappointments. It can be said that quality and much-visited sites have been successful because of their usability.

---

Among the basic usability keys are the following:

- simplicity,
- standard control that is common on most sites,
- not to force users to think unnecessarily.

To test the usability of the site:

In general, there are several usability ways that can specify and also determine the importance of user needs based on actual data and observations. According to many surveys, many sites are not usable at the ideal level, and users often find this quickly and leave these sites. In today's hurried time, it is necessary to expect that the average user's mind when visiting a particular site is such that the site is likely to be disappointed. Most users invest very little time when they say they often spend 10-15 seconds exploring a new site hoping to be one of the few good ones. If the site has an unusual or complicated impression, they leave the site in a few mouse clicks. A general conclusion, based on many findings from many usability studies, is that websites work best if they stick to the habits that users know from other sites. The basic assumption is that the more websites do certain things in a certain way, the more they usually increase usability by following these habits. This in practice works very well, as users know intuitively how these sites work.

If we want to evaluate whether the site is usable for searching information, then you can test the web based on the following steps:

1. Analysis of the target groups of the selected part of the pages, their needs
2. Select testers
3. Create a test scenario
4. The test itself (test description/record)
5. Analysis of test results and recommendations

#### **ANALYSIS OF THE TARGET GROUPS OF THE SELECTED PART OF THE SITE AND ITS NEEDS**

Depending on the site you can define the basic target groups of the selected part of the site and its needs. This is a basic requirement for evaluating the usability of the site.

## **SELECTION OF TESTERS**

You should not select testers who could not generally behave as real users of the selected part of the site. For certain sites, some specific skills and expertise are required directly from the tester, which are the target groups of the selected part of the site

## **CREATE TEST SCENARIOS**

The script gives the tester a certain context ("You're ...", "You want to do ..") and provides information that he should know but does not know (password to the test account, the address of the test page, etc.)

Nielsen (2005) states that some people think that usability is very expensive and complex, and usability tests are for large and exceptional websites with a huge budget. But as this expert says, this is not true because complicated usability tests are resource waste and the best results stem from usability testing of up to 5 users when it is realistic to perform as many small tests as you can afford.

## **THE TEST ITSELF (TEST DESCRIPTION/RECORD)**

The test itself must be documented in the form of a test description or record. The test record can be effectively documented on a video camera that accurately documents how the tester progressed while browsing the site and searching for the information required based on defined scenarios. You can also record a recording on the computer screen, or you can at least get an audio recording or a classic record of how to work on the paper.

## **ANALYSIS OF TEST RESULTS AND RECOMMENDATIONS**

Feedback based on test results is important. This feedback should provide an overall assessment of the usability of the site and recommendations for improvement if any errors or shortcomings have been found.



## **SELF WORK**

Process the design of the usability test scenario for the selected segment of the OPF site, perform a knowledge record test, and suggest measures to improve the usability of the allocated segment in the evaluation.

The breakdown into individual segments:

- 1) Main Page - side menu to the right, links to the main page, header, footer
- 2) Main page - Applicants section
- 3) Main page - section Students

4) Main page - section Graduates

5) Main page - section Public and Media

This is a work that is larger than usual (to work in a pair) in which students develop a draft of user-tested scenarios for assigned segments. At seminars with their colleagues from the seminar (after screening the scenarios), they will test and record the results they will then work on in their work with the proposal for action.

The basic structure of the seminar paper:

1. Introduction
2. Theoretical background.
3. Analysis of the target groups of the selected part of the site and its needs
4. Creating a test scenario (at least 5 scenarios per job)
5. Selection of testers (to describe theoretically, to select a colleague in a pair)
6. Testing itself (test description / record)
7. Analysis of test results (according to literature)
8. Recommendations (own reflection or literature)
9. Used resources.

Output: When presenting at a seminar where students present their section, describe the selected scenarios, summarize the course of the test, explain their conclusions and the reasons for their recommendations.

---

## 5.4 Managing information

Managing information is very important because information is not enough to gain, but it needs to be further processed, categorized, updated and often archived.

*Managing  
informa-  
tion*

Nowadays, the information needed to run the business is growing and growing. Human abilities to process all information are limited both because of capacity and time-consuming. It is, therefore, necessary to use the latest technologies and systems. Informative management is tasked with standardizing procedures and processes for handling this information. The information management system is designed to address the following issues:

- acquisition and processing,
- availability,
- categorization, indexing,
- access rights,
- document circulation,
- updates,
- archiving.

#### **5.4.1 CONTENT MANAGEMENT SYSTEMS**

**CMS**

CMS generates documents (articles) through web-based rendering using a simple online WYSIWYG editor or a simple text formatting system. HTML knowledge for content creation is not necessary.



#### **DEFINITION**

CMS is the software that manages documents, most often web content. Nowadays, as a CMS, web applications are commonly understood. Sometimes the CMS is also a synonymous editorial or publishing system.

---

Using a high-quality content management system, it is, therefore, possible to easily and effectively manage and change the content of the website. Beyond basic text publishing on the web, it's possible to create photo galleries, manage discussions, or run an online store with current content management systems. Some systems have integrated the above functionality already after the basic installation, and other editing systems can be installed using available extensions (plugins or extension).

In terms of architecture, the following components are distinguished:

- CMS core,
- databases,
- public section - Frontend,
- administrator part – Backend.

The basic functions of these systems are usually broken down by the interface to the administrator and user. The basic administrator functions are:

- creation, modification, and publication of documents (articles),
- creating and modifying content sections - multi-level sections (categories),
- creation and modification of navigation elements (manual or automatic creation of menus),



- access control for documents (administration of users and groups, access rights),
- managing discussions or comments,
- file management,
- managing images or galleries,
- manage templates for the look,
- managing language settings,
- calendar functions,
- access statistics.

The basic user functions are:

- browsing content (categories, articles),
- adding comments,
- user registration,
- taking news.

CMS is divided into four basic types of focus:

- WCM (Web CMS) - allows you to manage and organize Web content,
- TCM (Transaction CMS) - used in e-commerce,
- ICM (Integrated CMS) - for processing content in business,
- PCM (Publishing CMS) - facilitates organizing the development of publications.

Another division of CMS is possible as follows:

- By availability - paid, freely distributed,
- By platform - Apache + PHP + My SQL, MS IIS + ASP / .NET + MS SQL.

Among the most well-known and most widely used CMS systems are:

- Joomla,
- Drupal,
- WordPress.

Other popular, yet not so popular CMS systems include:

- Blogger,
- Magento,
- vBulletin,
- TYPO3,
- DataLife Engine,
- PrestaShop,
- Bitrix.

## **JOOMLA**

**Joomla** Joomla is a freely distributed software for creating and managing web pages, based on the GNU / GPL license. Joomla is written in PHP and uses the MySQL database. Joomla supports caching, site indexing, RSS, printable versions of pages, newsletters, blogs, newsgroups, polls, calendar, web server search, localization and multilingual versions. Joomla is one of the most popular open source content management systems in the world.

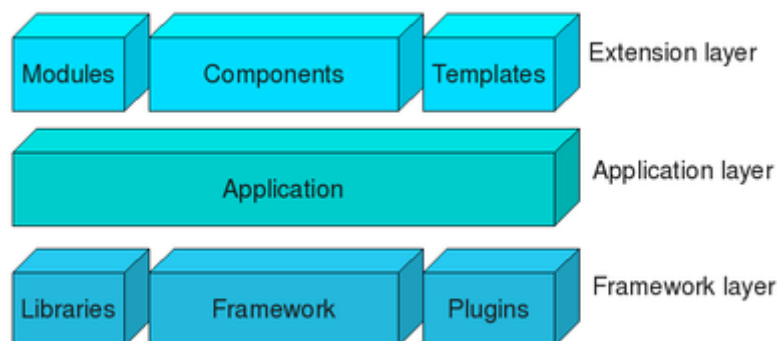
The official website [www.joomla.org/](http://www.joomla.org/) presents the following examples of system used in practice:

- Business websites or portals
- Company intranets and extranets
- On-line magazines, newspapers, and publications
- E-commerce and online reservations
- Government applications
- Small Business Websites
- Nonprofit and organizational websites
- Community-based portals
- School and church websites
- Personal or family homepages

The official website of the Czech Joomlaportal community presents the following features of the system:

- Working with Joomla is very easy. No need to know HTML or CSS
- Joomla is completely in Czech and free
- Joomla is ready for mobile devices
- The Joomla Directory offers more than 7900 extensions

**Figure 1: Joomla – architecture**



Source: <https://docs.joomla.org/Joomla!>

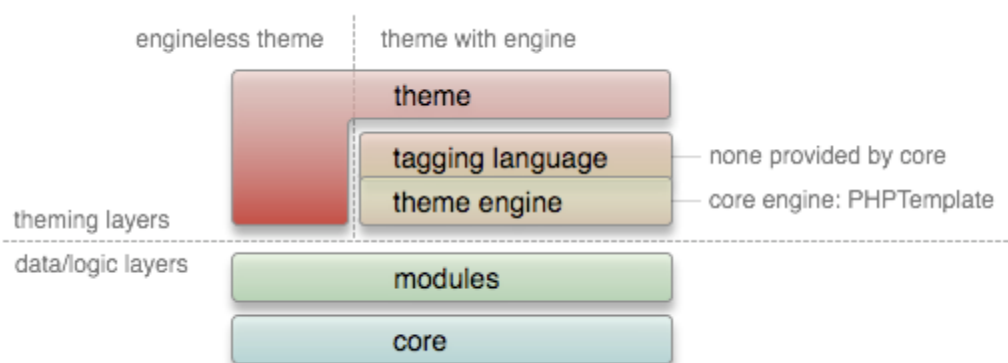
## DRUPAL

Drupal is a free content management system that allows you to create Internet magazines, blogs, online stores and other complex systems. It is programmed in PHP language. Officially supported Drupal databases are MySQL and PostgreSQL relational databases, and versions 7 and SQLite.

*Drupal*

Drupal is built in a modular way and sets forth its philosophy of code clarity and openness of the API. Easy scalability with the modules and many options it provides from Drupal makes one of the best editing systems. In addition, it is free with source codes as well. With modules, you can create an e-shop, a forum, or a corporate website.

**Figure 2: Drupal - architecture**



Source: <https://www.drupal.org>

### 5.4.2 DOCUMENT MANAGEMENT SYSTEM

Document Management or Document Management System (DMS) or Electronic Document Management (EDM) is a computer system designed to manage electronic documents and/or digitized paper documents, such as documents converted to digital by scanning.

*DMS*

A typical document management system solves the following issues:

- the inclusion of documents,
- searching for documents,
- managing version of documents,
- access rights,
- archiving,
- workflow "flow of documents".

Examples of specific document management applications:

- IS ALeX

- Alfresco
- Docker
- Rivera
- Xerox DocuShare



## **QUESTIONS**

1. What types of most important services do libraries provide?
  2. We can distinguish between borrowing services from the fund of a given library and two basic services
  3. What is the library system in the Czech Republic according to the Library Act?
  4. What kinds of databases do database centers provide?
  5. How can I define an electronic information resource?
  6. What do you know about search tools?
  7. What are search operators?
  8. What are the basic usability keys for the site?
- 



## **SUMMARY OF CHAPTER**

Libraries are historically the oldest institutions that collect different types of documents and also provide various information services. Archive is a device used to store and care for archive materials. The museum is an institution that acquires and collects natural and human creations for scientific and educational purposes, examines the environment from which natural and human creations are derived, from selected natural resources and human creations creates collections that are constantly kept, recorded and processed professionally. Galeria is a museum specializing in collections of fine arts. Information centers are institutions or specialized institutions of institutions that collect, process and make available information about a particular municipality, city, region, region, organization, project, field, etc. Database centers are institutions (often in virtual form) access to information funds. Their goal is to offer, produce and mediate access to professional and business databases. The special institutions include the Office for Technical Standards, Metrology and State Testing and the Industrial Property Office. An electronic information resource is characterized as an "information resource that is kept in electronic form and is available in computer network environments or other digital data distribution technologies".

The possibilities of obtaining information are nowadays thanks to information technologies greatly facilitated and speeded up compared to the past, when the gathering of information required much more effort and often costs. External information retrieval includes a variety of external resources, such as public registers, databases, printed matters, professional periodicals, television, professional seminars and conferences, training, promotional

materials and, of course, the internet as well. The information obtained may be of a different nature, such as general, technical, economic, legal, etc.

Search is an operation to determine whether the entered text contains the words you want, we will call them samples. If the entered text contains the samples you are looking for, we are also interested in the information about where the sample contains the sample. Search options on the Internet are considerable. In order to gain access to public or non-public information sources, we have a variety of search tools. The search tools include: subject catalogs, search engines, meta-search engines, virtual libraries. Search operators are characters with special meaning for full-text search engines.

Generally, a usable site is a site that allows its users to find the information they need, read news, register, order goods, etc. It can be said that quality and much visited sites have been successful because of their usability.

Managing information is very important because information is not enough to gain, but it needs to be further processed, categorized, updated and often archived. The information management system has to address the following issues: acquisition and processing, availability, categorization and indexing, access rights, document circulation, updates, archiving. In terms of using information management systems, for example, content management systems and document management systems are available.

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## ANSWERS



1. Loan service, study analysis activity, search services, reference information services, consulting services, bibliographic services, reprographic services.
  2. Absence and presence borrows books
  3. Libraries set up by the Ministry of Culture of the Czech Republic, regional library, basic library, special library
  4. Bibliographic databases, factual data bases, fulltext (fulltext) databases, catalog databases, registers, directories.
  5. It is an information resource that is kept in electronic form and is available in computer network environments or other digital data distribution technologies.
  6. Subject catalogs, search engines, meta search engines, virtual libraries.
  7. Search operators are characters with special meaning for full-text search engines. Most search engines apply a set of general operators to specify the conditions that the search query (content) should meet.
  8. Simplicity, the standard control that is common on most sites, does not force users to think unnecessarily.
-

## **6 INFORMATION STRATEGIES OF THE ORGANIZATION, MODELS OF ICT MANAGEMENT AND INFORMATION SYSTEMS IN ORGANIZATIONS**



### **QUICK REVIEW OF CHAPTER**

ICT management is a key factor in an organization's information strategy, which is one of the organization's partial strategies. Business management from an ICT point of view generally takes place at three basic levels - strategic, tactical and operational. In practice, two basic IT control models, ITIL and COBIT, are the most used. Every business or organization should have a good insight into its information management processes to make it more efficient to use the information. For this purpose, a company's information audit is normally performed. The most well-known system quality management tools include ISO 9000 standards, which can also be used to find the current universal definition of quality.

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### **OBJECTIVES OF CHAPTER**

After studying this chapter, you will be able to:

- define the concept of information strategy and management of ICT,
  - introduce the basic computer science management scheme,
  - define and describe the content of the ITIL and COBIT methodologies,
  - define the concept of an information audit,
  - identify key areas and areas that are monitored in an information audit,
  - specify the most commonly used ISO standards.
- 



### **TIME REQUIRED TO STUDY**

The time needed to study this chapter is about 3 hours.

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### **KEYWORDS OF CHAPTER**

Information strategy, ICT management, ITIL, COBIT, information audit, information system audit, ISO standards

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In the current information society, information and communication technologies (ICT) are becoming an increasingly important factor in supporting the achievement of defined corporate goals. The development of information and communication technologies leads to the processing of ever-larger volumes of electronic documents and digitization of documents originally made in paper form. ICT has become one of the tools to grow and develop an organization. That is why ICT demands are on the rise, helping to create value where they support business processes. The cardinal problem of many organizations is to link ICT to their strategic interests and day-to-day operations. The development of strategic planning in the field of ICT generally assists with the comprehensive interconnection of management activities and employees with the strategic goals of the company. Currently, several ICT management methodologies and models are defined and used to enable organizations to systematically step-by-step analyze business processes and model the ideal situation to make these processes as efficient as possible.

## 6.1 Definition of the concept of Information Strategy

ICT governance is a key factor in an organization's information strategy, which is one of the organization's partial strategies.

### **DEFINITION**



Informa-  
tion stra-  
tegy

The information strategy builds on and elaborates on the corporate strategy. The aim is primarily to support business goals with an appropriate information system and to effectively work with information in general. The information strategy also defines the overall concept of the enterprise information system development for two to three years. (Czech Society for System Integration, 2011)

In terms of the hierarchy between business strategies, it has a special position among functional strategies in the sense that it must support both superseded business strategy and other functional strategies, and should be interlinked to maximize IS / IT to support the achievement of strategic goals functional strategies. (Keřkovský, 2003)

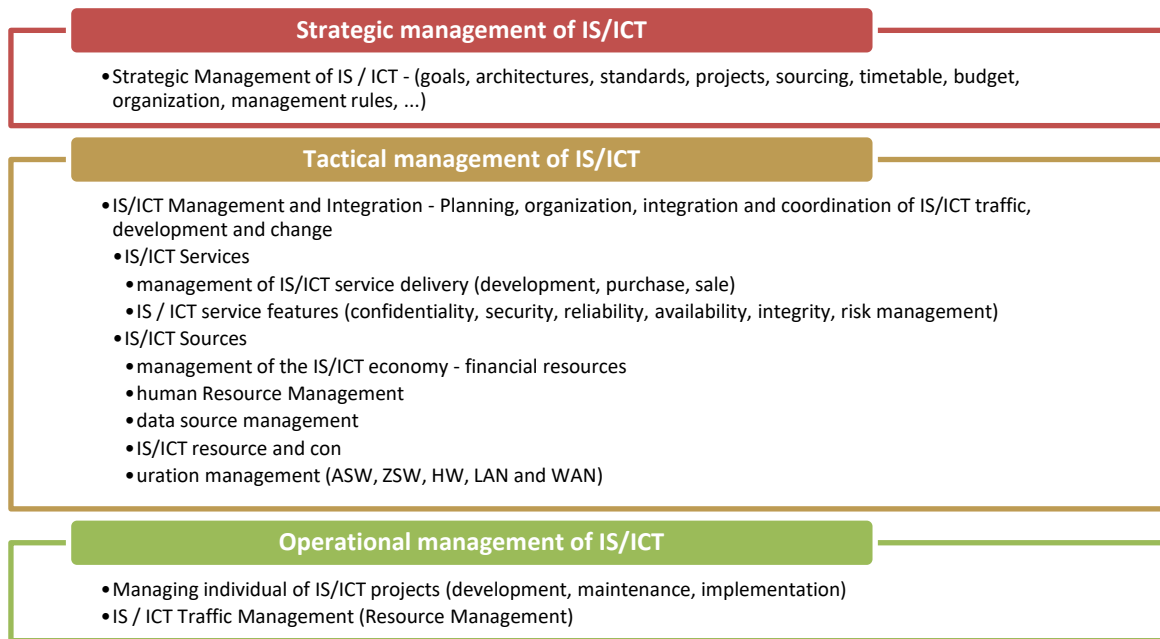
For example, according to Richta (2005), it is necessary to create an enterprise's information strategy in connection with the business development plan. Strategic planning of information systems in isolation from a strategic business plan is the root of later problems. An isolated creation of an information strategy plan is likely to lead to costly systems that will not be able to fully serve the needs of the business.

According to Maryška (2008), the information strategy ensures, above all, the mutual synchronization and interconnection of planned and solved projects and exploited applications. If an organization does not have an information strategy, usually investment in IT is not linked to corporate goals and thus does not provide enough return on IS / ICT investment.

## 6.2 ICT management in the enterprise

Business management from an ICT perspective usually takes place at three basic levels: strategic, tactical and operational. It is also the case in computer science. Each of these levels is further subdivided into areas, respectively. domains, control, and these then contain individual processes and control functions. This concept is documented in the following illustration.

**Figure 3: Basic schema of business informatics management**



Source: Custom processing by Gala, Pour and Toman (2005)

## 6.3 Methods and Models of ICT management

Gala (2005) has published that the importance of information technology for the performance and success of the company has put pressure on the rationalization of its management and the related development of various methodologies and models. In practice, two basic IT control models, ITIL and COBIT, are the most used.



### DEFINITION

ITIL - Presents a set of business informatics management practices through services provided by the Central Government and Telecommunications Agency (CCTA).



**DEFINITION**

COBIT (Control Objectives for Information and Related Technology) is a basic methodology of ISACA (Information Systems Audit and Control Association).

**6.3.1 ITIL**

ITIL stands for "Information Technology Infrastructure Library", which means "Information Technology Infrastructure Book". A number of companies and governmental organizations have worked together to create a set of Best Practices in the area of process management of IT support services. Currently, ITIL is in version 3 (consisting of 5 books). According to Basl (2008), ITIL contains one of the most comprehensive reference models for enterprise information management. Although not as structured as CMMI or COBIT, it is written in a very readable language. *ITIL*

The basic concept is the service that is the most important term ITIL and we understand it as an "IT" service because it is provided by an IT department or an IT company. This is the technical or organizational capacity IT provides to its users. It can take a variety of forms from e-mail, traffic and network management, such as backing up data. It is important to realize that each service has its own life cycle, which represents the "life" of service from its origin to operation and extinction. ITIL version 3 divided the life cycle of service into the following five phases:

- Service Strategy - In the first phase of the life cycle, a selection of services will be provided by the organization. It is chosen such a service that will bring profit and pay to operate it,
- Service Design - here is suggested how the selected service will look and from which technologies it will be composed,
- Service Transition - At this stage, the proposed service is physically created, which means, for example, that it is programmed and that hardware is purchased. It will also take place here,
- Service Operation - within which the service is operated and subject to routine IT support,
- Continuous Service Improvement - the service is continuously monitored and improved.

When deploying IT processes according to ITIL, the question of links to other processes is often underestimated, but it is key to the automation of IT processes. From this point of view, it is advisable to proceed according to the following scenario when implementing individual ITIL processes (Sveřepa, 2008):

### *Information strategies of the organization, models of ICT management and information systems in organizations*

- get a general idea of ITIL processes and their interrelationships,
- identify the IT process whose implementation by ITIL will bring the greatest benefit (or solve the most pressing problems),
- explore in detail its links to other processes and determine their multiplicity (eg one problem may relate to several incidents),
- if this is not the first implemented process, it is necessary to consider the impacts of the selected process on already deployed processes,
- consider the implications for other IT processes that we will implement in the future.

The most important benefits of ITIL implementation are as follows (Implementation of ITIL, 2011):

- cost savings for running IT services,
- better quality and reliability of IT services (more satisfied customers),
- better use of expensive ICT resources and fewer outages of ICT systems,
- a higher level of communication between ICT segment staff and customers/users.

### **6.3.2 COBIT**

**COBIT** The COBIT methodology covers IS/ICT management issues in a wider context and thus including aspects of corporate governance, which is the infrastructure. (Řepa, 2006)

According to Doucek, the following list of information criteria is available:

- efficiency,
- efficiency,
- confidentiality,
- integrity,
- availability,
- the match,
- authenticity.

According to Doucek, the following is a list of IT resources

- applications,
- information,
- infrastructure,
- people.

According to Doucek, the following is a list of domains for IT processes

- planning and organization,

- acquisition and implementation,
- delivery and support,
- monitoring and evaluation.

As part of the continuity management of IT activities, the COBIT methodology is important:

- protect,
- reveal,
- respond,
- restore,
- operate,
- return.

## **6.4 IS and Process-Oriented Strategic Concepts in Organizations**

According to Sodomka and Klčová (2010), process-oriented strategic concepts can be characterized as partial business strategies that enable the organization's strategic goals to be effectively implemented on the basis of IS / CTS and business processes. The following three sub-concepts can be defined:

- ERP Concept - based on the close interdependence of the information system, the management of internal processes, the full owner of which is the organization, and the management of external processes, the co-owners of which are the customers and suppliers of the company. The ERP conception is practically implemented through the ERP system or the ERP system. enterprise applications that, as an integrated whole, primarily serve to manage internal processes.
- CRM Concept - based on the close interdependence of the IS, the management of external processes, the co-owner of which is the company's customers. Practically it is implemented through the CRM system, enterprise applications that, as an integrated whole, primarily serve to manage contacts, marketing, business and service processes.
- SCM concept - is based on the close interconnection of the information system and the management of external processes, the co-owner of which is the suppliers, customers. This concept is realized in practice through the SCM system or the SCM system. enterprise applications that, as an integrated whole, primarily serve to manage supply chain processes or processes that enable the organization to be effectively integrated into the supply chain as part of it.

## 6.5 Information audit

Informa-  
tion audit

Every business or organization should have a good insight into its management processes in order to use the information more efficiently. For that purpose, an audit of the company is standardly carried out.



### DEFINITION

According to P.W. SECURITY, the following definitions of information audit can be stated:

The information audit is an interdisciplinary information discipline, mainly in the field of information science, information and knowledge management. It is used as the application of the theoretical foundations of information management in practice.

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In particular, it is important for the company to process, sort and hold information, especially the Information audit of the system.



### DEFINITION

According to P.W. SECURITY, the following definitions of information system audit can be mentioned:

1. An analysis of the information system to assess whether the system is in line with established requirements (user, legislative, qualitative, safety, standardization, etc.). An audit is performed by an independent Authorized Person or an Institution that does not have direct responsibility for the functions of the audited system.

2. Recording of events and activities carried out by the user or on his behalf, important for the security of the information system (so-called security audit). Together with identification and authentication, it is used to determine the responsibility for investigating security incidents.

---

The audit of the information system is an opportunity to examine the technical state of the sub-areas of the information system and the quality of system integration in the enterprise.

According to Bezoušek (2003), the key areas monitored in the audit include:

- information services used by individual business units, internal SLAs and metrics for these services,
- organizational issues related to the information system (business management approach to the IS, representation of the IT department in the company's management bodies, payment for the management of IS requirements, etc.),
- business strategy, business and development plans and their impact on information system requirements,
- enterprise crisis management, backup, and disaster planning / recovery,
- existing outsourcing relationships, relationships with current suppliers,
- error checking system, error costs, loss insurance, third party penalization,
- mechanisms for evaluating the conditions of the IS and compliance with the requirements of the law, evaluation of the IS within the framework of the audit, internal control and audits of the information system,
- change management in key processes supported by the information system.

In the framework of the final audit report, the individual technological units, as well as the information from the managerial level, are compiled back to create an overall picture of the information system from the point of view of its operational and development needs and possibilities. According to Alexander (2016), audit outputs in the form of an audit report should be processed in a form that is comprehensible to the intended recipient. In many cases, the audit report is prepared in several versions - a brief summary report for the top management of the organization, and a detailed, technically specialized report for responsible IT staff.

The usual structure of IS security audit outputs includes:

- description of the detected condition,
- basic safety assessment of the system,
- description of identified deficiencies in the documentation,
- a description of the identified vulnerabilities and safety deficiencies of the IS,
- identification of critical locations,
- draft countermeasures, including recommendations for the implementation process.

As Alexander (2016) states, he should also identify the vulnerability of the IS and the threats that arise from the lack of security measures. The task of the audit is to highlight the vulnerabilities that have been identified in order to eliminate or mitigate these threats and vulnerabilities by means of subsequent security measures to a measure acceptable to the organization.

These measures are classified as:

- Preventive - to prevent the occurrence of security incidents. An example is a system of assigning and managing access rights to a group of authorized persons, authorization systems, identification, and authentication.
- Reduction - measures that can be taken in advance so as to minimize any damage that may occur. An example is the system of back-up or organizational continuity management.
- Detection - if a security incident occurs, it is important to detect this as soon as possible - detect it. An example is a security incident monitoring system or an antivirus program.
- Repressive - measures against the continuation or repetition of a safety incident. An example is the temporary blocking of an account or network address after unsuccessful login procedures or a card hold after login attempts with an incorrect PIN code.
- Corrective actions - measures to quickly remedy the damage. An example is to retrieve data from a backup or return the system to the last stable version.

## 6.6 Integrated management system using ISO standards

ISO

According to Doucek (2010), it is one of the world's most well-known ISO 9000 quality management system tools, in which the current universal definition of quality can be found.



### DEFINITION

According to the Office for Standards, Metrology, and Testing, ISO standards are international, internationally valid standards issued by the International Organization for Standardization. Quality management systems form a specific set of standards. The requirements of ISO standards are universal, can be used by organizations regardless of their type, size, and scope. Most standards are designed to allow integration with other management systems.

Technical standards are documented agreements that provide for general and reusable use rules, guidelines, guidelines or characteristics of activities or their results that ensure that materials, products, processes, and services meet the intended purpose.

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International Standards ISO 9000 has been developed by ISO / TC 176 Quality Management and Quality Assurance Technical Committee. The above standards have been approved by the European Committee for Standardization (CEN) as EN ISO standards without any modifications.

### **6.6.1 ČSN**

The Czech Technical Standard is marked with a six-digit number (sorting mark) and the name, eg: ČSN 80 0001 Textile Sorting and basic names.

In addition to standards declared as harmonized, Czech technical standards are non-binding, binding only when their use is contractually agreed between the organizations concerned. The same applies to MS. standards that introduce European and international standards.

### **6.6.2 ČSN ISO**

The Czech Technical Standard, which introduces the ISO international standard into the Czech standards, is referred to as the ISO standard number, the classification of the Czech technical standard and its name, eg: ISO 1144 (80 0050) Textiles. The introduction of international standards into the national standards of the Member States is voluntary.

### **6.6.3 ČSN EN**

The Czech Technical Standard, which introduces a European standard into the Czech standards system. It is marked with the European standard number, the classification of the Czech technical standard and the name, eg ČSN EN 12751 (80 0070) Textiles - sampling of fibers, yarns and fabrics for testing. European standards are transcribed into CSNs in most cases by translation, so these CSNs do not differ from the original European standard in any provisions. The introduction of European standards into national standards is mandatory for CEN members.

### **6.6.4 ČSN EN ISO**

The Czech Technical Standard, which introduces into the Czech standards system a European standard identical to the international ISO standard. It is marked with a European standard number (identical with the ISO standard number), the classification of the Czech technical standard and the name, eg ČSN EN ISO 105-A01 (80 0120) Textiles - Tests for colorfastness - Part A01: General principles of testing.

The most important representative in the area of quality management is the ISO 9001 standard, which specifies the requirements for QMS of the organization. The current version of ISO 9001 was published in September 2015, the Czech version of ISO 9001 is valid from March 2016.

According to the Institute for Testing and Certification, the main benefits of ISO 9001 certification are:

- stabilization of the achieved qualitative level in the range of products and services,
- increase revenue through efficiently set processes,
- increasing the credibility of the company in the eyes of customers and other business partners,
- getting new customers through delivering high-quality production,
- introducing order and rules into all activities within the company,
- the possibility of retrospective control of compliance with the set rules in the quality system,
- applying preventive measures to prevent potential disagreements and defects.

In addition to the ISO 9001 standard, there are other standards applicable to other areas of organization operation (Quality and Performance Enhancement ISO 9004: 2010; Information Security Management, Information Technology, Security Technologies: ISO / IEC 27001: 2014; 18001: 2008; Environmental management ČSN EN ISO 14001: 2016; Risk management: ČSN EN ISO 31000: 2010 and others).

Who is ISO 9000?

- organizations that try to get benefits by implementing a quality management system,
- organizations that try to gain the confidence that their suppliers will meet the product requirements,
- product users,
- anyone interested in understanding the terminology used in quality management (eg suppliers, customers, competent authorities),
- all persons, both internal and external to the organization, who assess the quality management system or perform its audit in terms of compliance with ISO 9001 requirements (eg auditors, competent authorities, certification/registration authorities),
- all individuals, both internal and external to the organization, providing advice or training on the quality management system that is appropriate for the organization.

In today's society, technical standards are qualified recommendations, not mandatory regulations. Their use is voluntary but universally beneficial.

What is the technical standard for?

- are a prerequisite for free circulation of goods and services, especially in the EU,
- serves as the reference level for measuring/evaluating the quality of a product or service,



- establish safety criteria,
- promote a balanced relationship between quality and cost,
- are often binding in business contracts between the supplier and the buyer,
- may be required for public procurement,
- become an effective tool for competitive competition in competition,
- protect the environment and take care to protect health,
- enable mutual support / mutual compliance of the environment and competitiveness,
- protects both consumers and manufacturers,
- ensure efficient production,
- ensure consistency between products and services,
- are an effective tool.

### FOR THE INTERESTER



Overview of the most important ISO standards according to the Office for Technical Standards, Metrology and Testing:

#### **ISO 9000: 2015 Quality management systems - Fundamentals and vocabulary**

Introduced in CSN EN ISO 9000: 2016 (01 0300) Quality management systems - Basic principles and vocabulary.

This International Standard describes the basic concepts and principles of quality management that are universally applicable to:

- organizations that strive for sustainable success through the introduction of the quality management system,
- customers seeking confidence in their ability to permanently provide products and services that meet their requirements,
- organizations that seek to gain confidence in their supply chain that product and service requirements are met,
- organizations and stakeholders who seek to improve communication through a common understanding of the vocabulary used in quality management,
- conformity assessment organization according to ISO 9001 requirements,
- providers of training/training, assessment or quality management consultancy,
- processors of relevant standards.

Specifies the terms and definitions that apply to all Quality Management and Quality Management System standards developed by ISO / TC 176.

## **ISO 9001: 2015 Quality management systems - Requirements**

Introduced in ČSN EN ISO 9001: 2016 (01 0321) Quality Management Systems - Requirements.

This Standard specifies requirements for a quality management system where an organization needs to demonstrate its ability to provide a product or service that meets the customer's requirements and regulatory requirements, and when it intends to increase customer satisfaction through effective application of the system, including processes for its continuous improvement. The requirements of the standards are applicable to any organization, regardless of its type or size, or the products and services it provides. The standard uses an ISO framework to improve the alignment of international standards of management systems.

This International Standard uses a process approach and risk assessment. The process approach, which includes the PDCA cycle, enables the organization to make sure that its resources are secured and managed, that the opportunities for improvement are set and are being pursued. Risk Consideration allows the organization to identify factors that could cause its processes and its quality management system to depart from planned results, to establish preventive management tools to minimize negative effects and maximize the opportunities that will arise.

## **ISO 9004: 2009 Managing the sustained success of an organization - A quality management approach**

Introduced in CSN EN ISO 9004: 2010 (01 0324) Sustainable Organization Sustainability Management - Quality Management Approach

The standard provides guidelines to help achieve the sustainable success of any organization operating in an ever-changing environment. It provides a broader view of quality management systems than the ISO 9001 standard and, in more detail, develops some sub-themes such as knowledge management and innovation. Part of the standard is a table for self-assessment of the organization in relation to the different levels of maturity of the quality management system. The standard is not intended for certification. A revision of ISO 9004 is currently underway.



### **QUESTIONS**

1. At what three basic levels is business management running from an ICT perspective?
2. What do you know the most commonly used two basic models of enterprise information management in practice?
3. What are the core areas of the Audit of the Information System?

4. What is the usual structure of IS security audit outputs?
  5. What are the main benefits of ISO 9001 certification?
  6. Are use and certification according to technical standards obligatory for all?
- 

## **SUMMARY OF CHAPTER**



The information strategy is based and elaborates on the corporate strategy. The aim is primarily to support business goals with an appropriate information system and to effectively work with information in general. The information strategy also defines the overall concept of the enterprise information system development for two to three years. The information strategy ensures, in particular, the synchronization and interconnection of the planned and solved projects and the implemented applications.

Business management from an ICT perspective usually takes place at three basic levels: strategic, tactical and operational. It is also the case in computer science. Each of these levels is further subdivided into areas, respectively. domains, control, and these then contain individual processes and control functions.

In practice, two basic IT control models, ITIL and COBIT, are the most used. ITIL - Presents a set of business information management practices through services provided by the Central Government and Telecommunications Agency (CCTA). COBIT (Control Objectives for Information and Related Technology) is a basic methodology of ISACA Information Systems Audit and Control Association.

The information audit is an interdisciplinary information discipline, mainly in the field of information science, information and knowledge management. The audit of the information system is an analysis of the information system, which aims at assessing whether the system complies with established requirements (user, legislative, qualitative, safety, standardization, etc.).

The ISO 9000 series is one of the most well-known ISO quality management system tools in which the current universal definition of quality can be found. According to the Office for Standards, Metrology, and Testing, ISO standards are international, internationally valid standards issued by the International Organization for Standardization.

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## **ANSWERS**

1. Strategic, tactical and operational
  2. ITIL and COBIT
  3. Information services used by individual business units, organizational issues related to the information system, company strategy, business and development plans and their impact on information system requirements.
  4. Description of the detected situation, a basic security assessment of the system, description of identified deficiencies in the documentation, description of identified vulnerabilities and IS safety deficiencies, identification of critical sites, the proposal of countermeasures, including the recommendation of the implementation procedure.
  5. Stabilization of the achieved quality level in the product and service assortment, increase revenues through efficiently set processes, increase the credibility of the company in the eyes of customers and other business partners.
  6. In today's society, technical standards are qualified recommendations, not regulations. Their use is voluntary but universally beneficial.
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## 7 ICT AND INNOVATION AS A SUPPORT FOR ENHANCING THE PERFORMANCE OF THE ENTERPRISE

### QUICK REVIEW OF CHAPTER



The chapter on ICT and innovation as a boost to business performance is firstly focused on getting to know the basic concepts of business performance such as performance, metrics, performance management, efficiency, and effectiveness. In addition, attention is paid to Corporate Performance Management (CPM) and Business Intelligence (BI).

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### OBJECTIVES OF CHAPTER



After studying this chapter, you will be able to:

- understand the basic concepts of business performance,
  - know principles of Corporate Performance Management (CPM),
  - know principles of Business Intelligence (BI).
- 

### TIME REQUIRED TO STUDY



The time needed to study this chapter is about 2 hours.

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### KEYWORDS OF CHAPTER



Performance, metrics, performance management, efficiency, CPM, BI.

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Performance management is a traditional discipline of information management, as mentioned by Doucek (2010). Extensive developments in IS / ICT have changed the speed and scope of solved tasks over the past. With Corporate Performance Management (CPM) and Business Intelligence (BI) tools and tools, it is possible to manage enterprise performance as a comprehensive entity and flexibly respond to changes in the business and its surroundings. A number of activities at different levels of management have been automated and thus, more attention can be devoted, for example, only to strategic decisions. These

decisions can be based on advanced visualization of complex data both directly from the enterprise and its surroundings. It is also possible to compare different scenarios and to retrospectively evaluate and monitor the success of the proposed strategy.

A highly competitive environment puts businesses at a disadvantage, with which they must be able to cope. Essential, according to Kaplan and Norton (2007), are the following:

- managing activities in a global context,
- flexible organizational structures,
- optimization of production and efficient supply-chain management,
- production of quality services,
- continuous innovation and improvement of the quality of products and services,
- the changing nature of work, knowledge management in the enterprise, continual improvement of internal processes,
- implementation of information systems that effectively support all essential processes (both internal and external).

## **7.1 Basic terms of enterprise performance**

The basic terms of business performance include the following: performance, metrics, performance management, efficiency, and effectiveness.



### **DEFINITION**

According to Šulák and Vacík (2004), performance is defined as "the ability of an enterprise to best value the investments embedded in its business activities".

The metric is, according to Novotný (2008), a precisely defined measure that is used to evaluate the specified attributes. An exact definition is a defined procedure that is used to obtain a measured value, including the design and application of measurement dimensions and a definition of how the acquired values will be compared and interpreted.

Effectiveness is, according to Luthra (2007), a comparison of what was actually created with what could be created with the same range of use of routine resources as money, time and labor.

Efficiency is defined as the measure that characterizes the fulfillment of planned goals without cost.

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According to Luthra (2007), then effectiveness determines whether things are done correctly and effectiveness again determines whether the right things are done.

## 7.2 Corporate Performance Management (CPM)

Corporate Performance Management (CPM) is the most powerful performance management system. The term Corporate Performance Management itself appeared at the end of the 1990s but was not clearly defined and defined. It is only after 2000 that Gartner has created a uniform definition recognized by the academic and commercial environments.

CPM

### DEFINITION



Corporate Performance Management (CPM) is a comprehensive term describing all processes, methods, metrics, and systems needed to measure and manage organization performance (Geischecker and Rayner, 2001). Outputs are based on aggregated data and serve as the basis for strategic decisions of senior management (Bruckner, 2012)

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CPM is a holistic approach to implementing and monitoring a corporate strategy, combining Coveney (2003):

- Methodologies - including methodologies that support efficient and effective business management (for example Balanced Scorecard). At the same time, the implantable methodology of CPM system suppliers (for example Cognos),
- Metrics - which are defined in the implementation of these methodologies in an enterprise,
- Processes - used by an enterprise to implement and monitor performance management,
- Applications and technology - Information systems to support performance management at all enterprise levels that support the methodology, metrics, and processes.

Performance management is enterprise-focused and typically includes the following components (Felkner, 2010):

- Strategic planning - creating, communicating, deploying, monitoring, and managing corporate strategic plans for tasks, budgets, actions, people, and performance goals.
- Planning, budgeting, and forecasting - for example, testing various scenarios, developing realistic budgets, identifying trends and performance imbalances, and updating plans and budgets.
- Consolidation - for example, the implementation of fiscal consolidation makes it possible to streamline and manage the whole process of verifying, consolidating, reporting and submitting financial data.
- Reporting - an attempt to automate the generation, formatting, and distribution of financial statements and management reports from accounting books.

- Expenditure management - the goal is to ensure that the impact of effective spending management over the employees can have an impact on overall profitability.
- Analyzes - to monitor key performance indicators in real time and to test trends in order to prepare for change and respond quickly.

### 7.3 Business Intelligence (BI)

BI

Business Intelligence tools are also being used to boost business performance.



#### **DEFINITION**

Business Intelligence (BI) can be defined as a set of skills, knowledge, and technology that can be used in business to gain a better understanding of market behavior and business contexts. Within BI, for this purpose, the collection, analysis, interpretation, and presentation of important business information that may contain the collected information itself or the explicit knowledge gained from the information is carried out.

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What are the main benefits of using Business Intelligence?

- more detailed and clear outline of the actual state of each area,
- discovering hidden links and contexts,
- comprehensive access to all data,
- quality analyzes and outputs in the form of reports, dashboards, and forecasts,
- effective implementation of the company information system,
- flexibility and flexibility to provide reporting/analysis capability.

According to Laberge (2012), BI technology can be used for many purposes including:

- performance measurement or base level determination,
- trend and prediction analysis,
- associated grouping, market basket analysis or segmentation,
- power management,
- associative analysis or data mining,
- analysis of the subject areas.

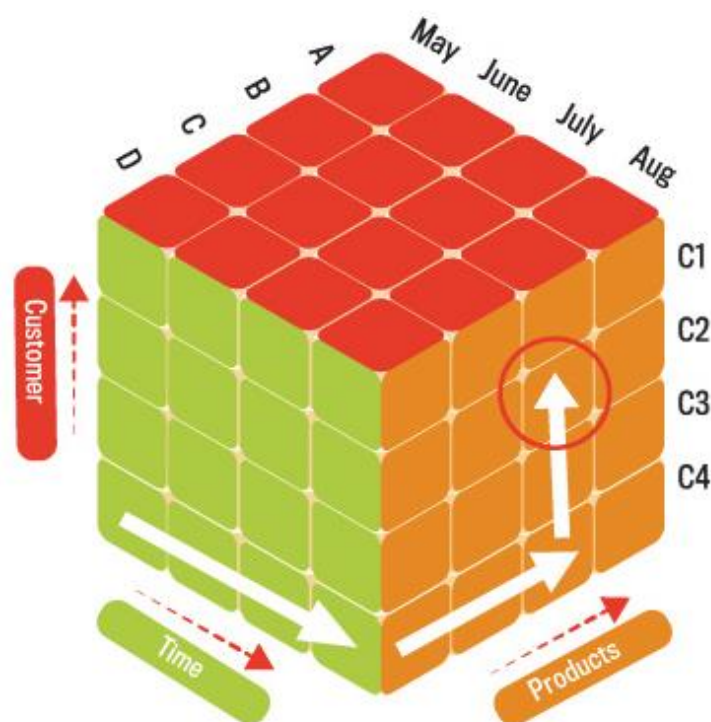
What data does Business Intelligence work with? These are predominantly structured data from relational databases. These data are processed within the first stage within the ETL, which is an abbreviation for extracting, transforming and uploading data to a data warehouse. Data can be extracted from various data sources, such as relational databases, spreadsheets, and other structured data sources. Subsequently, the data format is transformed. This data is



then uploaded to the data warehouse, which serves as the primary data source for BI applications. What's important is that the data is stored in a historical warehouse in a historical form, allowing you to report the development of that metric over time.

In terms of basic concepts in BI, multidimensionality and granularity of data are emerging. Multidimensionality consists of several dimensions that can be explained by not looking at in-house data and relationships with just one glance, but from multiple views of angles of view. Working with dimensions is mainly appreciated by analysts because this feature allows us to get a better insight into the issue. A multidimensional cube and OLAP are key to this process. According to Pour, Maryška, and Novotný (2012), the granularity of the data determines the level of detail of the data-facts, stored in the facts table. The granularity of the data in the fact table is directly dependent on the number and level of detail details corresponding to the relevant factsheet. For example, if we have a defined structure in a time dimension of up to one day, and in the D\_Dimension dimension for one sub-product, then each record in the fact table (grain) is at the level of "one piece goods" and "one day". This gives the granularity of the factsheet and similarly in relation to other dimensions".

**Figure 4: Example of an OLAP cube.**



Source: <http://sfmagazine.com> (2016)

Common Business Intelligence applications typically include the following areas:

- reporting,
- support for analyzes,
- data cubes (OLAP),

- dashboard, balanced scorecard,
- data mining,
- business Performance Management (CPM),
- support planning and predictive analysis.

According to Novotný, Pour and Slánský (2005), tools and applications for implementing Business Intelligence include:

- production, source systems,
- Data Staging Area (DSA);
- Operational Data Store (ODS),
- Transformation Tools (ETL),
- Integration tools (EAI - Enterprise Application Integration),
- Data Warehouses (DWH)
- Data Markets (DMA - Data Marts),
- OLAP,
- reporting,
- Managed Applications (EIS) - Executive Information System,
- Data Mining,
- data quality tools,
- metadata management tools.

From the point of view of using BI tools in business practice, it can be said that nowadays, BI is not the size of the business, because there are BI solutions from small businesses to large multinational companies. BI is therefore primarily intended for any business that demands a correct and rapid analysis of its own data, needs, and resources. Small businesses can use BI tools in co-operation with, for example, Microsoft Office (Excel, Access) with built-in applications to output and update data. On the other hand, global companies will use highly sophisticated and financially demand. But there are also open-source BI tools on the market such as Pentaho, Jaspersoft or BIRT.



## **QUESTIONS**

1. Define the term performance
  2. Define the concept of metric
  3. Define the term efficiency
  4. Define the term efficiency
  5. Define the term Corporate Performance Management (CPM)
  6. Define the term Business Intelligence (BI)
-

## SUMMARY OF CHAPTER



Performance management is a traditional discipline of information management. The basic concepts of business performance include the following: performance, metrics, performance management, efficiency, and effectiveness.

Performance is defined as "the ability of an enterprise to make the best possible return on investments invested in its business activities".

Metric is a "precisely defined measure that is used to evaluate specified attributes. Accurate definition means a defined procedure that is used to obtain a measured value, including the design and application of measurement dimensions, and a definition of how the acquired values are compared and interpreted.

Efficiency is a comparison of what was actually created with what could be created with the same range of use of common resources as money, time and labor.

Effectiveness is defined as a measure that characterizes the fulfillment of planned goals without cost.

Extensive developments in IS / ICT have changed the speed and scope of solved tasks over the past. With Corporate Performance Management (CPM) and Business Intelligence (BI) tools and tools, it is possible to manage enterprise performance as a comprehensive entity and flexibly respond to changes in business and its surroundings. Corporate Performance Management (CPM) is the most powerful performance management system. Corporate Performance Management (CPM) is a comprehensive term that describes all the processes, methods, metrics, and systems needed to measure and manage your organization's performance. Outputs are based on aggregated data and serve as background for strategic decisions of top management executives. Business Intelligence (BI) can be defined as a set of skills, knowledge, and technology that can be used in business to gain a better understanding of market behavior and business contexts. Under BI, the collection, analysis, interpretation, and presentation of significant business information that may contain the collected information itself or the explicit knowledge gained from the information are collected for this purpose.

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**ANSWERS**

1. Performance is defined as "the ability of an enterprise to make the best possible return on investments invested in its business activities".
  2. The metric is the "precisely defined measure that is used to evaluate the specified attributes. An exact definition is a defined procedure that is used to obtain a measured value, including the design and application of measurement dimensions, and a definition of how the acquired values will be compared and interpreted.
  3. Efficiency is a comparison of what was actually created with what could be created with the same range of use of common resources as money, time and labor.
  4. Effectiveness is defined as a measure that characterizes the fulfillment of planned objectives without cost.
  5. Corporate Performance Management (CPM) is a comprehensive term that describes all the processes, methods, metrics, and systems needed to measure and manage the organization's performance. Outputs are based on aggregated data and serve as background for strategic decisions of top management executives.
  6. Business Intelligence (BI) can be defined as a set of skills, knowledge, and technology that can be used in business to gain a better understanding of market and business contexts.
-

## 8 TRENDS IN THE CONTEMPORARY INFORMATION MANAGEMENT

### QUICK REVIEW OF CHAPTER



As in other areas, new trends are emerging, and information management is no exception, and must also respond to current ICT trends that have a significant impact on this area. These trends include mobility and ubiquitous connections, Big Data, Social Media, Cloud computing, view of ICT as a consumer matter and GDPR. Each of these trends influences in a way the requirements of information management: mobility and ubiquitous connections result in increased mobility of workers, change of working tools, change of speed of decision making and the influence of work on the personal lives of workers, Big Data is of particular importance from the point of view of rapid growth of new data, growing data needs, increasing availability of storage devices and the emergence of new data formats. Social media today is generally a means of sharing the text, visual, and audiovisual material amongst themselves and with companies. Cloud computing also brings a new business model where it offers services or programs over the Internet, and in the case of paid services, users do not pay for the software itself but only for its use.

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### OBJECTIVES OF CHAPTER



After studying this chapter, you will be able to:

- know the trends in current information management,
  - know the consequences of these trends in ICT.
- 

### TIME REQUIRED TO STUDY



The time needed to study this chapter is about 3 hours.

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### KEYWORDS OF CHAPTER



Mobility and ubiquitous connectivity, Big data, Social media, Cloud computing, GDPR

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Trends in current information management can be found in many authors dealing with this issue. For example, Doucek (2013) writes that trends include mobility and ubiquitous connections, Big Data, Social Media, Cloud computing, ICT as a consumer thing.

A number of trends in information management are published by Gartner.

## **8.1 Mobility and ubiquitous connections**

### **Mobility**

Mobility and ubiquitous connections influence the style and way not only of everyday life but also the style and way of work of individuals and work teams. These changes lead to far more flexible work and often lead to the fact that employees of some occupations also work in their spare time after the end of official working hours.

The main impacts of mobility and ubiquitous connections can be:

- worker mobility,
- change of working tools,
- change of decision speed,
- the impact of work on the personal lives of workers.

### **8.1.1 WORKERS' MOBILITY**

Employee mobility is one of the consequences of the development of information technologies that allow them to work outside of the office. Workers are therefore not geographically restricted and can, therefore, work for employers, for example, from another country or continent. Another important factor is globalization, where it is possible to work within multinational companies within international teams that will never personally meet. So-called "global data centers" are so often created within global companies to share the necessary information amongst staff. These centers often arise in countries and places with the lowest cost.

### **8.1.2 CHANGE OF WORKING TOOLS**

The development of computers headed first from desktops to laptops and is now often shifting from laptops to even more mobile devices such as tablets and smartphones. Information management must adapt to this trend and pass on information in such a way that it can be used to work with tablets and smartphones (different resolution, touch control, etc.). The main advantage is higher mobility for teamwork and communication, virtually anywhere, anytime.

### 8.1.3 CHANGING DECISION SPEED

Especially for executives, there is noticeable pressure on decision-making speed. Nevertheless, it is necessary to ensure the quality and accuracy of the decision. Information management must be able to provide timely information in the required quality and quantity for these quick decision makers.

### 8.1.4 THE IMPACT OF WORK ON THE PERSONAL LIVES OF WORKERS

The above factors, such as worker mobility, changing working tools and changing decision-making speeds, often have a negative impact on workers who may suffer from stress due to overworking and communication with colleagues outside of working hours. As a major prevention against this work stress, it is absolutely necessary to find a balance between personal and working life and not to be overwhelmed with unnecessary information.

## 8.2 Big Data

The term Big Data is relatively new in information management. The Big Data label itself suggests that data are large in scope. An important question, however, is how large the data needs to be characterized by the term Big Data.

*Big Data*

### DEFINITION



Recognized research and consulting company Gartner defines Big Data as data whose size, the speed of growth and diversity do not allow their processing based on current, known and proven technologies in a reasonable time.

Big Data can be characterized according to Mayer-Schönberger and Cukier (2014) with the "three V" characteristics (volume, velocity and variety = volume, velocity and variety).

At present, Big Data is critical in terms of information management because it significantly increases the amount of data available, one of the key components of information management, as Doucek (2013) points out.

The huge increase in the amount of data that is characteristic of Big Data has been created by Gartner (2011) as the concept of extreme information management. For the Big Data area, you can find certain characteristics that capture real impacts on practice:

- the rapid growth of new data,
- growing need for data,

- increasing the availability of storage devices,
- new data formats,
- new data sources.

Basic concepts and techniques used to work with Big Data include, according to Holubová et al. (2015) the following:

- distribution - distributed data processing in the form of problem distribution on clusters of interconnected nodes,
- replication - storage of data on multiple nodes, ideally in different parts of the network,
- scalability - ability to flexibly respond to changing requirements (eg higher data volumes, higher system load, etc.)
- consistency - a database system based on ATC (atomicity, consistency, isolation, durability) properties that convert data from one consistent state to another.

According to Burian (2014), the market for Big Data solutions can be divided as follows:

- Hardware - emphasis on performance, frequently integrated solutions including specialized technical equipment,
- Big Data Distribution - Software components designed to process large amounts of unstructured and distributed data,
- Data management - primarily NoSQL database for loading and writing large volumes of data,
- Analysis and visualization - the pressure to increase the volume of analyzed data increases.

### **8.3 Social media**

*Social  
media*

Social media is generally a means of enabling users (consumers) to share among themselves, and with companies, both text, image, and audio-visual materials.



#### **DEFINITION**

The definition by Kaplan and Haenlein (2010) then states that social media is a group of Internet-based applications based on the ideological and technical basics of Web 2.0 platforms and enabling the creation and exchange of user-generated content.

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According to Kotler and Keller (2013), there are three major social media platforms:

- online communications and forums,



- blogs (individual or centralized),
- social networks.

Today's social media can include Facebook, Google+, VKontakte, LinkedIn, Twitter, YouTube, Skype, MySpace, Bebo, etc.

- Facebook - the world's best-known social networking platform, serving as a platform for creating personal, corporate, and group profiles. Facebook was established in 2004. In 2017, 2 billion active users worldwide (Facebook Q1 2017 reports 4.8 million). Facebook is a very extensive web-based system designed primarily to create social networks, communicate with users, share multimedia data, maintain relationships and also enjoy many different games. Facebook is used just like other major social networks for marketing purposes.
- Google+ - originated in 2011 as Facebook. The main difference is, as stated in Burian (2014), in setting up sharing via so-called circles that can divide individuals and share things with those who benefit or are affected by it.
- VKontakte - an international social network, a Russian analog of American Facebook, founded in 2006. According to Alexa.com, it is the most visited social network in Russia, Ukraine, Belarus, Moldova, and Kazakhstan. It is the second most visited site in Russia. In 2017, this social network had 480 million active users.
- LinkedIn - over the past it serves more as a professional or work network. Shows participant profiles, references, and links to their focus and work. Managers, consultants, and professionals from all sorts of fields are among the users. LinkedIn reports as the world's largest professional network with more than 300 million members. LinkedIn is also often used by HR professionals who can find a suitable job candidate on the basis of information contained in individual profiles containing more detailed information about their career, jobs, and education.
- Twitter - allows users to send and read messages sent by other users (tweets). The tweet is a text post with a maximum of 140 characters, which is displayed on the user's profile page and also on its followers' pages.

From the point of view of information management, the issue of the correct presentation of the company on social networks is important, which is demanding both in terms of expertise and time. Social networks have hundreds of millions of users, so social media marketing has become an important part of company communication with the public and a significant source of income for advertisers. For this reason, a large number of foreign and Czech companies have this social communication at a specialized PR (Public relation) agency. If outsourcing is not used directly, in the case of companies, some employees are often entrusted with presenting the company to social media. According to combinatorial calculations (Štědroň and Budiš, 2009), it is very likely that everyone knows up to a maximum of 7 people. Social networks thus hide the enormous potential of marketing media. Marketing on social networks is an important component of company promotion. Smith and Treadaway (2011) report that it is important to ask the following questions at the outset:

- What do you mean?
- How do you say that?
- Do you need your own content or will you refer to other content on the Internet?
- Who will publish this content?
- What do you need to create (logos, icons, new graphic designs, custom applications) to meet business goals?

In addition to feedback, social networks are being used as an effective marketing tool. According to Příklad and Jahoda (2010), these are mainly the following forms:

- monitoring attitudes and opinions in forum discussions, conferences, etc.,
- offering the right form of collaboration to the most active discourse or blogger,
- placing suitable video clips or photos on YouTube and other content sharing sites,
- creating discussion forums for a brand or product, or active participation in existing forums,
- creating a corporate blog,
- establishing a brand profile in selected social networks,
- creating applications where users can put ideas about a business or brand,
- implementing appropriate PR activities, issuing special press releases for social networking,
- information source for collecting data on registered users,
- space for viral marketing.

In the field of information management, social media according to Doucek (2013) have the following additional effects:

- in-house communications - deployment of intranet sites and newsgroups, in-house social networks
- communication with clients - new communication channels through social media
- client knowledge - client analysis based on its activity on social networks
- data analysis - a large number of new, especially unstructured data in relation to social media that can be analyzed using specialized algorithms
- new data formats - a very diverse data form

## **8.4 Cloud computing**

*Cloud computing*

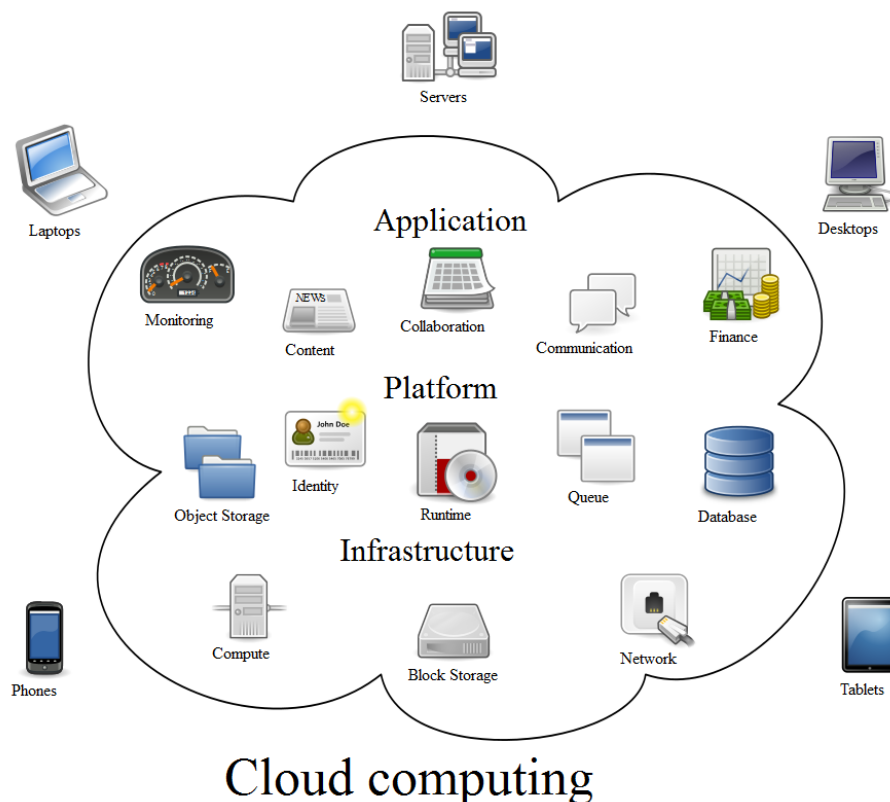
Cloud computing is based on a model based on the development and use of various computer technologies in its basic principle.

**DEFINITION**

Cloud computing is a comprehensive IS / IT service model that enables the development and use of computer technology on a basic principle of sharing hard-wired and software resources over the Internet. Such provision of services or programs on servers available from the Internet enables users to access their programs and services remotely, for example, using a web browser.

It is the operation and provision of various services or programs where, in the case of paid services, users do not pay for the software itself, but only for its use. Used services are available over the Internet in the form of, for example, remote access, web browsers or e-mail clients.

**Figure 5: Diagram showing overview of cloud computing, with typical types of applications supported by that computing model.**



Source: Wikimedia Commons, Cloud computing

The increasing use of cloud computing is a very significant change in corporate ICT in recent years. From the point of view of providing data to users, this change is also very relevant to information management, as there are many questions about working with corporate data, sharing, backing up and security.

According to the IDC survey (Kroa, 2012), Czech companies have the following cloud concerns: security concerns, cloud modeling is not advanced, single provider dependence, high cloud migration costs, lack of adequate information, unclear return on investment, price or lack of Internet connectivity.

What are the basic characteristics of cloud solutions? Cloud computing is characterized by the following key attributes:

- Multitenancy - the ability to share and use multiple services based on several leases of these services among all users in the organization.
- Online availability anytime, anywhere - Internet access is available to services, and software can be used virtually anytime, anywhere.
- Scalability and elasticity - flexibility based on the current need to operatively change computer resources and their performance.
- Up-to-date - up-to-date software from the provider.
- Pay as you go - Flexible costs in the form of charging services based on the "how many services we use, so we pay for them".

We distinguish several models of deployed cloud computing that tell us how and to whom the cloud is provided:

- Public cloud computing - access when a given service is provided to the general public, and the same or very similar functionality is available to all. Example: List.cz, Skype.
- Private cloud computing - access when a given service is available only for that organization. Example: Hosted mail server or hosted specialized application.
- Hybrid (hybrid cloud computing) - a combination of the public and private cloud.
- Community cloud computing - an approach where infrastructure is shared between several organizations (users) who use it.

We differentiate between several cloud computing distribution models that tell you what is offered in the customer service (hardware, software or a combination of them):

- IaaS - Infrastructure as a Service - the principle is that the service provider undertakes to provide infrastructure. A typical form of virtualization. Examples of IaaS: Amazon WS, Rackspace, or Windows Azure.
- PaaS - Platform as a Service - the principle is that the provider guarantees complete means to support the entire lifecycle of creating and delivering web applications and services; all services work fully within the Internet and there are no software downloads. Examples of PaaS: Google App Engine or Force.com.
- SaaS - Software as a Service - the principle is that the application is licensed as a service that is leased to a customer. The customer therefore only purchases access to the application, and not the application itself. Examples of SaaS: Google Apps apps.

Advantages of cloud computing:

- the absence of management and control of the functionality of HW and SW components,
- availability of data and programs anywhere, whenever and wherever it is connected to the Internet,
- most intuitive and simple user interface,
- scalability - the ability to instantly increase data center performance when needed,
- current versions of programs, fast customization according to growth and user needs.

Disadvantages of cloud computing:

- absolute dependence on internet connection,
- strong dependence on service providers,
- security and privacy - Internet usage generally raises many questions about the security of data and user privacy,
- required migration costs - cloud-based applications often reprogram or change company software and train their own employees,
- fewer features - SaaS solutions generally offer fewer features than desktop solutions,
- poor stability - availability of cloud services is strongly dependent on the quality of Internet connection.

Lacko (2012) deals with mining by storing and backing data through various cloud services. He states that, according to statistics, average laptops or tablets are stolen every minute, and almost half of them contain sensitive data, with only a small percentage of computers equipped with encryption or other sophisticated data protection methods. For this reason, it is a much safer method of storing documents in cloud storage, which in addition increases our mobility. Also, when you save a document to a cloud storage, it is automatically synchronized when accessing multiple devices. You will also avoid data loss, which is a threat if you only store your data locally on your computer and do not back up.

Velte and Elsenpeter (2011) address the issue of data security in cloud systems and data privacy concerns at a third party. Based on these findings, cloud storage can be considered to be a much safer form of data storage and backup than when you store data on a local disk.

## **8.5 ICT as a consumer matter**

ICT is today a common consumer thing that we often use without thinking that the use of ICT is not free and brings some necessary costs. The ICT infrastructure providing data and information is not free of charge, and in the case of excessive data and information, it

is necessary to use additional financial resources to obtain, process and interpret it. The goal of information management is to ensure that users receive the right information at the right time without unnecessary overspending.

## **8.6 General Data Protection Regulation**

General Data Protection Regulation (GDPR) is the new revolutionary EU legislation that greatly enhances the protection of citizens' personal data.



### **DEFINITION**

The GDPR is a new legal framework for personal data protection in the European area to defend as many EU citizens as possible from the unauthorized treatment of their data, including personal data.

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GDPR applies to all businesses and institutions, but also to individuals and online services that process user data. The GDPR has introduced astronomical fines for violation of rules and requires some data controllers or processors to set up an independent Data Protection Officer (DPO).

The general regulation responds to the digitization of the company. It replaces European legislation of the 1990s that did not guarantee adequate protection of personal data in the digital world. The new rules will better protect the privacy of Europeans in the digitized society, strengthen consumer confidence and security, and thus support the further development of the digital economy. The general regulation ensures uniform rules across the EU. Data is very mobile and knows no boundaries. The general regulation has the right to guarantee to citizens that protection travels across borders alongside personal data. Businesses mean uniform rules of legal certainty and easier business across the EU. The main innovations of GDPR are the following:

- One set of rules across the continent, which for businesses means legal certainty and the same level of protection for citizens across the EU. The same rules apply to all companies providing services in the EU, even if they are based outside the EU.
- Stronger and newer rights for citizens: the right to information, access to personal data and the right to be forgotten are strengthened. The new data portability right allows citizens to move their data from one company to another, giving companies new business opportunities.
- Better protection against personal data breaches: A company that has breached data security that could pose a risk to individuals must report the incident within 72 hours to the DPA.

- Strict rules and deterrent penalties: data protection authorities will have the power to impose fines of up to EUR 20 million or (in the case of companies) up to 4% of worldwide annual turnover.

## QUESTIONS



1. What are the main impacts of mobility and ubiquitous connections?
2. What are the characteristics of the real impact of Big Data?
3. What are the three major social media platforms?
4. What is the social media's impact on information management?
5. Define cloud computing
6. What is the difference between cloud computing distribution models?
7. What are the main advantages of cloud computing?

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## SUMMARY OF CHAPTER



Information management must respond to current ICT trends that have a significant impact on this area. These trends include mobility and ubiquitous connections, Big Data, Social Media, Cloud computing, and a view of ICT as a consumer.

Mobility and ubiquitous connections result in factors such as increasing worker mobility, changing working tools, changing decision-making speeds, and also impacting on the personal lives of workers.

Big Data from the information management point of view is crucial especially due to the rapid growth of new data generation, the growing data needs, the increasing availability of storage devices and the emergence of new data formats.

Today, social media is generally a means of enabling users (consumers) to share text, video and audiovisual material with one another and with each other. These media have hundreds of millions of users and that is a big challenge for marketing, which is an important part of company communication with the public.

Cloud computing is mainly about the provision of various services or programs via the Internet where, in the case of paid services, users do not pay for the software itself but only for its use. IaaS, PaaS, or SaaS distribution models then tell you what's all within the service.



**ANSWERS**

1. Employee mobility, changing working tools, changing the speed of decision making, the impact of work on the personal lives of workers.
  2. Rapid growth in new data, growing data needs, increasing the availability of storage devices, new data formats, new data sources.
  3. Online communications and forums, blogs (individual or centralized), social networks.
  4. In-house communication, new communication channels through social media, client analysis based on its activity on social networks, necessary to deal with data in accordance with the law, endeavor to economically use the acquired data
  5. Cloud computing is a comprehensive IS / IT service model that enables the development and use of computer technologies on the basic principle of sharing hardware and software resources over the Internet.
  6. IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service)
  7. No need to manage and control the functionality of HW and SW components, availability of data and programs anywhere, whenever and wherever Internet connectivity, mostly intuitive and simple user interface, scalability - the possibility of immediate improvement of data center performance if needed, current version of programs, rapid adaptation to growth and user needs.
-



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Zákon č. 122/2000 Sb. o ochraně sbírek muzejní povahy a o změně některých dalších zákonů

## **SUMMARY OF THE STUDY TEXT**

Information management includes information processes involving the acquisition, processing, preservation, mediation, and use of information. Information in the current era of the information society has become a strategic factor in promoting business and is often a significant competitive advantage. It is essential to have timely information on in-house processes and activities for correct and quick decision making, as well as information from the organization's surroundings, which creates conditions, but often rules, for the activities of organizations.

In terms of content, this distance learning study is focused first on getting acquainted with the definition, tasks, and roles of information management. The chapters are also devoted to basic concepts such as data, information, knowledge, and documents. The study text also focuses on information support, information resources, acquisition, search, and management information, and a chapter dealing with the organization's information strategy, ICT management models and information systems in organizations. An extensive part is also devoted to ICT innovation issues as support for increasing the performance of the company and the final chapter is focused on trends in current information management.

The overall purpose of information management is comprehensively characterized by Professor Davenport's quotation: "Information management must consider how people use information, not how they use machines."

From the point of view of applying to the labor market, information management is linked to the following job positions: project manager, business analyst, business consultant, auditor of information systems, IT manager, risk manager, security systems manager, executive director (CEO), internal auditor, IS architect.

## OVERVIEW OF AVAILABLE ICONS



Time to study



Key words



Study guide



Quick Preview



Tutorials



To remember



Solved task



Control question



Answers



An independent task



For those interested



Chapter Goals



Do not forget to rest



Text Wizard



Summary



Definition



Case study



Sentence



Correspondence task



Questions



Other sources



The task for thought



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