



### *Original Contribution*

## **INFORMATION MANAGEMENT OF PROFESSIONAL RECORDS**

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### **ABSTRACT**

Bulgarian universities have to prepare documents in various formats and structures to demonstrate their capabilities to external evaluation committees. Some types of documents are based on the data about professional achievements of academic staff. Maintaining electronic records and retrieving information is a specific information management task that requires implementation of appropriate information technology. The current work is related to a study of information management and design of the specific tools of achieving effective management of professional records of the research staff.

**Key words:** information management cycle, information technologies, information systems, professional records, e-files

### **INTRODUCTION**

Information Management (IM) is a separate trend in management, which is associated with specific management functions and tasks for creation and maintenance of a particular data resource. Improving the information system of an organization provide opportunity to extract sufficient information by this resource to assist management decision making. Often such information facilitates certain processes of external evaluation of the organization such as its capacity to carry out an activity. In recent years the Bulgarian universities must have the latest information about staff in various formats and structures to demonstrate their capabilities to external evaluation committees. The delivery of these documents is unpleasant, laborious and inefficient process because it is not considered in the meaning of the concept of information management. The misconception is that the requested information is accepted as the real information resource. In fact it is just the result data of a possible information system for professional records of the research staff.

Each model of information management is characterized by subject area, objectives and tasks. The exchange of electronic documents

between Dean's Office and departments has adopted as the subject area in a project 6I/2010 of Faculty of Economics. Maintaining and retrieving information from electronic files of academic staff is a specific information management task that requires implementation of appropriate information technology.

The current work is related to the first phase of this project – a study of the subject area and design of the specific tools of achieving effective management of professional records.

### **INFORMATION AS A SUBJECT OF MANAGEMENT**

The understanding of the concepts such as data, information, knowledge and wisdom is fundamentally to information management (**Figure 1**). Data are facts or measurements that are used to perform calculations, to carry out discussions. Data accuracy is the most important requirement for data. Information is a crucial resource, on which people make major decisions about the organizations. It is of great importance to manage and evaluate available information adequately. Information is data that has been given a specific context or data that has been acquired some meaning. Knowledge is information that is transformed by reflection into beliefs and concepts (1).

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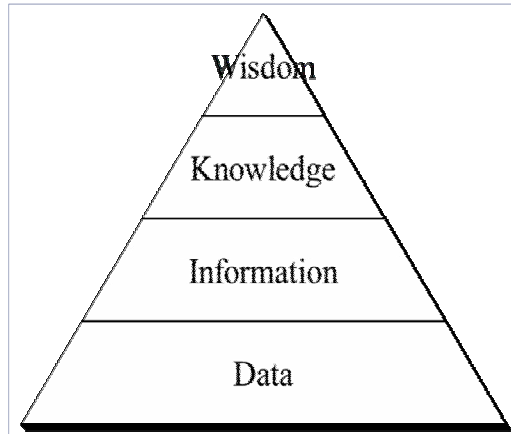


Figure 1. A pyramid of Wisdom.

## 1. Essence of Information Management

There are many different definitions of IM:

- IM is collecting and management of information (regardless of its physical form), collected from various sources, and its distribution to consumers. Information management includes the processes of retrieval, organization, processing and delivery of data (2).
- According to Barbara Laffan "Information Management describes the means by which an organisation efficiently plans, collects, organises, uses, controls, disseminates and disposes of its information, and through which it ensures that the value of that information is identified and exploited to the fullest extent." (3)
- Bernard Robertson-Dunn defines IM as "... the means wherein the existence of needed information is made known to managers. ... It fosters the effective use of information for specific business purposes and information conservation, sharing and recycling throughout an organization and between organizations with mutually supportive aims ..." (4). Bernard Robertson-Dunn makes an attempt to differentiate often overlapping concepts Information Management, Information System and Information Technology. He defines them broadly as:
  - Information Management = writing
  - Information Systems = publishing
  - Information Technology = printing
- IM is a management of information resources and processes. It involves the activities related to: identifying information needs; acquisition and creation of information; its analysis and interpretation; its organization and storage; access to information and its dissemination; use of information (5).

- According to Ivan Sariev IM is a planning, organizing, directing, controlling and using information as a strategic resource of the organization, in order to "inform" people about knowledge and achievement of the organizational mission (6).

For the purposes of our work we accept the concept of IM as a set of methods and tools for management of information activities of enterprises and organizations. IM is associated with specific functions and tasks:

- creating and maintaining a specific information resource,
- continuously improvement of the information system of a certain organization.

IM is much more than technology. It includes people, processes, technology and content.

## 2. Concept for the information management cycle

IM requires careful planning, hard work and usage of appropriate means to achieve the goal. IM can be seen as a cycle rather than a linear process (**Figure 2**). The cycle allows opportunities for feedback and change throughout the implementation process (7-8).

The first stage is **conceptualization**. It is connected with the need of assessment and information.

This is the stage of planning the entire process of IM – clearly define the objectives to be achieved. An important point is the understanding and proper evaluation of the situation and the objects and subjects that will be included in IM.

Conceptualisation phase includes determining the information needs. It provides answers to the questions what information should be collected, what data are needed and what are their sources. The determination of the ultimate goals indicates what can be achieved through gathered and analyzed information.

The second stage is **data collection**. It includes: questionnaire design, data collection methodology, data collection, questionnaire improvement.

Data have to be properly collected and "qualitative" to get "qualitative" result from IM. It is necessary to define precisely information needs in order to collect

"qualitative" data. This definition is at the stage of conceptualization.

The methodology of data collection may involve different approaches. This depends largely on the nature and characteristics of the organization and on the specifics of the information to be collected. Selected

approaches can be tested and possibly modified to improve the process of data collection.

The monitoring and controlling the process of data collection is essential because it is important to obtain the "correct" data through the established approaches.

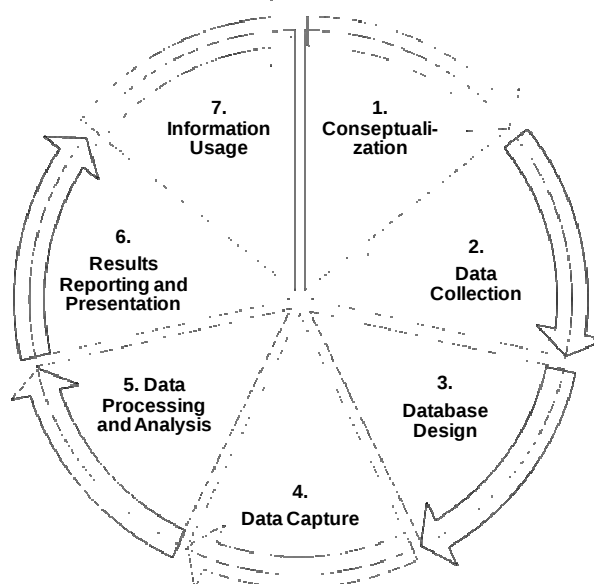


Figure 2. IM cycle.

The third stage is **database design**. This stage is relevant to the software platform, design of tables' structure, database development, testing, database installation, documentation, and training.

This stage is related with determining the manner of storing data. Collected data have to be properly organized so they can be used effectively. It is necessary to implement a standardized format for data storing, appropriately modeled database, regardless of software platform. It is essential to determine the proper structure of database tables and relationships between them.

The fourth stage is the **data capture**. The main activity in this stage is data entry.

Important point in the process of data entry is the verification of the correctness of the data. Data validation may be a complex task because data can be received in various formats. The verification of data correctness includes verification of the completeness of the data. The next step is comparison of the data with similar data obtained from other sources.

The fifth stage is **data processing and analysis**. IM includes data editing and formatting, consistency verification, data consolidation.

Data entries can be edited and formatted according to specific purposes by means of the chosen software platform. Data can be grouped by various criteria and processed to receive summarized results, which can be analyzed.

The sixth stage is **results reporting and presentation**. These activities can be done through tables and reports, customized reports, export to other formats, charts and diagrams, maps.

This stage can be regarded as a stage of presentation and dissemination of results. Processed information can be displayed in various forms by means of the Information system – tables, graphs, reports. Reports may contain different levels of details. It is very important that they contain the necessary information for specific purposes. They have to be specific and standardized to meet the needs of consumers.

Mandatory requirement to the Information system is the obtained results can be used as input for processing for other systems. This means that there will be provided export to other formats.

The seventh stage is **information usage**. This stage ensures the processes of management, planning, monitoring and evaluation.

There are two main approaches to use information: collected data usage without any analysis and information usage after it has been analyzed. Analyses can range from simple grouping and comparing data to mathematical, statistical or geo-spatial analyses.

The meaning and interpretation of information is a task for managers. They have to find answers to the questions, based on the results obtained from different analyses.

The last stage of the cycle does not end the process of IM. It is a prerequisite for re-execution of the cycle. The main goal is to increase efficiency in various stages of the cycle.

### 3. Characteristics of IM

IM is not a technological problem and it is not insurmountable.

Requested characteristics of IM in order to be effective are:

- The right information to the right person in the right format at the right time.
- Realizing the need for a decision.
- Success only if there is a real usage.
- Provision of real and visible benefits.
- Establishment of priorities.
- Readiness for a continuous process.
- Discipline and strict control.
- Calculated risk.
- Intensive communication.
- Mandatory participation of consumers.
- Regular first choice.

### THE ROLE OF INFORMATION TECHNOLOGIES IN INFORMATION MANAGEMENT

Information technologies (IT) can be considered as the technical infrastructure through which information is processed and distributed among users (4-5). Using IT users have access to various applications, databases, and communication services. IT are a necessary basis for IM, they assist

organizations to increase speed and reliability of their work.

There are different information systems that can assist IM:

#### 1. Web Content Systems and Enterprise Content Management Systems

Both systems are subcategories of Content Management Systems (CMS). CMS support creation, management, dissemination and publishing information. Information may be in the form of documents, images, movies, etc. Each CMS uses a database to store data and metadata. Administration of these systems is usually remote and web-based. Using CMS many users can publish and share content. Administrators usually define different user groups with different access rights to the system. These systems provide opportunities for generating different reports. The main feature of CMS is that they provide tools for data management and do not require any special knowledge and skills by consumers.

Web Content Management Systems (WCMS) are CMS, developed as Web applications. These systems are used for creation, editing, management and maintenance a huge amount of dynamic Web-content.

Enterprise Content Management Systems (ECMS) consist of core web content management system and have additional features for managing a wide range of information about activities within the organization. The management of information includes collection, management, preservation and provision of data related to the organization and processes that take place in it – management of document, records, digital assets and other.

#### 2. Document Management Systems (DMS)

Document Management Systems are used to manage the process of creating documents and tracing the flows of documents. DMS provide opportunities for documents storage, retrieving them from the repository, scanning paper documents and converting them into electronic format, integration of document management in other applications, documents publishing and etc. DMS is usually regarded as a component of Enterprise Content Management Systems and are closely related to Records Management Systems and Digital Asset Management systems.

### 3. Records Management Systems (RMS)

Records Management Systems support management of records. Records management is connected to the control over the creation, receipt, maintenance, use and disposal of records resulting from activities within an organization. RMS offer opportunities to capture, maintain and provide access to records. These systems are used to manage both physical and electronic records.

### 4. Digital Asset Management Systems (DAM)

Digital Asset Management systems are used to capture, categorize, store and manage digital objects. These systems are designed to assist management of multimedia resources – images, video and audio materials.

### 5. Learning Management Systems (LMS) and Learning Content Management Systems (LCMS)

Learning Management Systems automate organization and management of the learning process. This includes tools for accessing to online content, creating and organizing learning activities, tracking of training, interaction between participants in the learning process. LMS are implemented not only in education but also in business. Many companies use LMS for staff training without leaving the workplace, control of their knowledge, training them through various courses and resources for self-study, training of customers and others.

Learning Content Management Systems are systems that provide opportunities for creation, storage, organization and delivery of personalized content for e-learning. The emphasis is on online educational content that is delivered in the form of learning objects. LCMS combines the capabilities of LMS for managing the learning process and capabilities of CMS for creating and storing content.

LMS focuses on the management of the learners, tracking their progress and performance in different types of educational events and activities. LMS are not used to create educational content.

LCMS focuses on the learning content. These systems provide opportunities and tools to enhance the effectiveness of the processes of educational content creation.

### 6. Geographic Information Systems (GIS)

Geographical Information Systems are used for capture, processing, storage, analysis and visualization of spatial data set. Records in GIS provide real-world objects with digital data. Real-world objects are presented by two types of abstractions – discrete and continuous objects. There are two basic methods to represent data in GIS through these two abstractions – raster and vector.

### 7. Others

This category of Information systems includes varieties of the above systems or systems that support their work:

- Brand Management Systems – they are used for the management of advertising and promotional materials. They are specific applications of the more general DAM category.
- Library Management Systems – they provide the tools to administrate all activities of the libraries.
- Digital Imaging Systems – they automate the processes of creating electronic versions of paper documents and thereby assist Records Management Systems.

## INFORMATION SYSTEM FOR ELECTRONIC RECORDS IN TRAKIA UNIVERSITY

### 1. Evaluation of current system

So far in Trakia University there is not an efficient information system for management of professional records to facilitate the delivery of documents from departments to Dean's and Rector's offices.

Such documents are often required for attestation, accreditation, reports for certain periods and more. According to our observations their preparation is not efficiently enough and resulted in duplication of data, random and fragmented information, and lack of completeness. There are difficulties in updating and reconciliation of information, fragmentation of databases or used repositories and etc. In this case, the objectives of the information management must remove these problematic processes and situations.

Trakia University uses an Information system based on the requirements of the Ministry of Education, Youth and Science. Using this system the university submits reports to the Ministry in CSV formats twice a year. Reports are about students, PhD-students and scientific staff.

Information includes the following nomenclatures: personal information, education, professional file. Database is maintained by specialists in Payroll (Labour and Remuneration). The system creates summaries by: faculties; type contract; posts; ranks; individual electronic record and addition print version.

The system performs its main function – monitoring the faculty staff and students' status. But there are some constraints and gaps in digital content. E-records do not include fields for different types of scientific activities such as participation in conferences, books, guidances, publications, projects, citations. It is not possible to derive summarized reports of scientific production for certain period. Currently this information is not updated.

## 2. Relationship between the Information system of Trakia University and Project 6I/2010

The basic position is that the Information system of the project will not duplicate the functions of the Information system of Trakia University. It is possible to exchange data

between both systems and to implement a practical proposal for joining the systems. The officers of the departments and academic staff will have access rights and could enter data for scientific activities. Data entry should not be a priority of only one group of people.

Text files are used as e-files at the current moment. They are a good source to initialize the database. Especially useful will be to put into service reverse flow of information to the Information system of Trakia University.

## INFORMATION SYSTEM OF THE PROJECT 6I/2010

An **object area** of the current IM is the exchange of electronic documents between the Dean's Office and departments.

An **information-management task** is to maintain professional records of academic staff and retrieve information from them.

We use an adapted cycle to realize IM in the project (**Figure 3**). It includes the following steps:

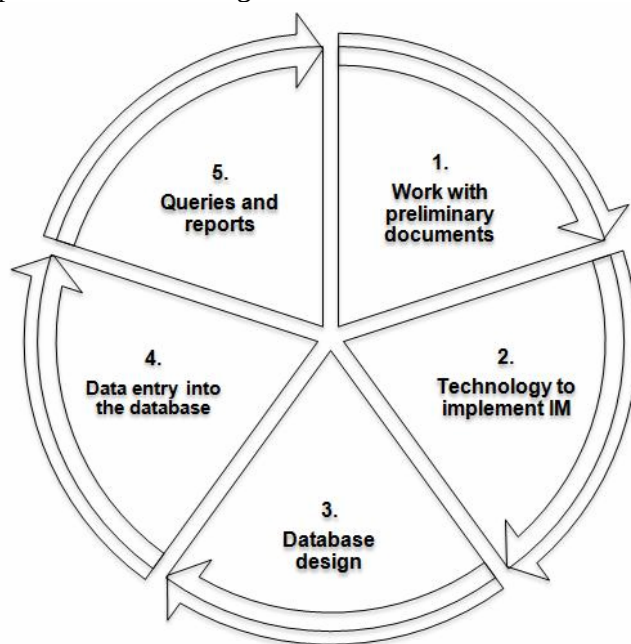


Figure 3. Adapted cycle of IM

### 1. Work with preliminary documents:

- Research the types of file formats;
- Setting the standard;
- Choice of mechanism for converting all documents to a specified format;

### 2. Technology to implement IM:

- Research of IT tools;
- Evaluation and comparison;
- Choice of tool;

**3. Database design:**

- Tables' structure;
- Database development;
- Application of the rules for verification of the correctness of the data;
- Test;
- Documentation;
- Training.

**4. Data entry into the database:**

- Application of the mechanisms of point 1 for available documents entry;
- New documents entry;

**5. Quiries and reports:**

- Custumized reports;
- Export to other formats.

**CONCLUSION**

The project 6I/2010 aims to explore the possibilities of available information technologies in the organization of an effective management of the establishment, maintenance and use of professional records for the research staff.

As a result of our research and analysis so far we

- Have come to a successful data model and gone beyond the theoretical "jungle" IM.
- Have created a successful and productive adapted cycle of IM.
- Have specified the tasks of the implementation of IM.

- Have established a strategy for connection with existing Trakia University system.

Such approach ensures that the objectives of the current project will be implemented.

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