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Information Management: Concept, Teaching, Applications

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Summary:

The paper explains the concept of information management as worked out and used by the Department of System Analysis of the Prague Economic University. Differences with some other typical interpretations of this term are exposed. Finally experience with teaching and practical applications of information management is briefly characterized.

1. Concepts of information management

In the theory as well as practice the concept of "information management" (IM) has not yet gained the clear and generally accepted interpretation. Three major reasons seems to be relevant for this situation:

a) Different **interpretations of the term "management"**. One can easily find tens of definitions, sometimes rather distinct from each other and expressed by eminent management authorities (Vodáček, Vodáčková, 1996).



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In the further explanation we do understand under the term of management the set of proven approaches, methods, experience and recommendations used by executives (managers) for coping with specific activities to achieve the goals of the organization. These specific activities are sequential managerial functions, like planning, organizing, staffing, leading and controlling, being the core of managerial activities.

b) Different **interpretations of the term "information"**, as we know them from the vast world literature (for example Vodáček, Rosický, 1997).

In the further explanation we accept that "Information is data endowed with relevance and purpose. Converting data into information thus requires knowledge" (Drucker, 1990, p. 202).

c) The **changing leading ideas about the major use and roles of IM** since 1960s to the present days.

According to our opinion one can follow the development of the term and concept of IM in three principal stages.

In the **first stage** (the second half of 1960s) the role of IM had been primarily identified with skill of the right choice and use of data, methods and approaches for ensuring "engineering efficiency" in solving technical and technological tasks. Probably one of the first use of the term IM was by R.S. Taylor and his colleagues during the conference to engineering efficiency in 1966 (Taylor, 1966).

Later in the 1970s the term IM had begun to be frequently used for some tasks of data processing, for example in providing order into information resources in technological documentation, libraries etc.

In the **second stage** (the end of 1970s and during 1980s) the term IM had been used primarily for methods and approaches of professional working in the field of informatics. The accent had been on the managerial approaches and techniques for efficient handling of information resources, primarily the efficient design, implementation and use of information systems (IS). Efficient information processing through IS had been usually considered as final goal of IM.

For example Michael J. Earl suggests that "information management comprises planning, organization and control of information resourcesEffective information management requires planning methods, control procedures and organizational arrangements to be congruent with each other. In the main they also must fit the management practices of the firm at large" (Earl, 1989, p.24).

Due to the fact that planning, organization and control constitute key parts in most concepts of sequential managerial functions - one can see, that in Earl's view IM is considered as managerial support for dealing with information.

In the second stage in the development of IM concept one can already see and appreciate the emphasis on transdisciplinary integration of information processes with management approaches. It helped to respect economic criteria of efficiency in designing, implementing and using IS.

On the other hand one could frequently observe absence or insufficient participation of the end users of information resources or IS in their creation. They rarely posed questions and looked for answers how IS/IT could help significant

innovation of managerial work (to formulate new managerial tasks or philosophy of the solution of traditional ones).

One can say in a bit simplified way that IM was considered as a set of managerial methods and approaches serving to the needs of technologically oriented informatics (IS/IT). Or "doing things right" (efficiency). It has been reflected in the growing introductions of Information Managers, Chief Information Officers etc. in organizations using IS/IT.

In the **third stage** (since the beginning of the 1990s) the concept of IM reflects more and more the managerial priority for the use of IS/IT. The accent is on the final use of IS/IT, i.e. innovative solution of managerial tasks, primarily the effective fulfillment of the mission and goals of the organization. One can see the growing attention being paid to the right effectiveness of the information processing ("doing the right things").

As the first example we can quote the "Association of Information and Image Management" (AIIM in Great Britain) defines IM as "the effective production, storage, retrieval and dissemination of information in any format and on any medium to support business objectives" (Best, 1996, p.4).

As the second example we can quote William J. Martin's definition of IM as "management of information resources of an organization in pursuit of its aims and objectives. As such it requires the application of standard management processes of planning and control, while seeking to ensure the day-to-day flows of information for decision-making and the concurrence of information and business strategies within the organization" (Martin, p. 171).

In the third stage in the development of IM concept there is a growing stress on the final effect for the use of IS/IT, i.e. on the "value matrix" of managerial work. The priority of managerial goals and objectives came into forward being reflected in the requirement of effectiveness for the use of IM too ("doing the right things"). And effectiveness is not put into contradiction, but in coalition, with the dual additional requirement for efficiency ("doing the things right").

2. Concept of IM at Prague University of Economics

Since the beginning of the 1990s the Department of System Analysis of the Prague University of Economics was working on the concept of IM too. It was caused not only by needs of the modern pedagogical process corresponding to the standards of advanced industrial countries, but at the same time by needs of a very rapid dissemination of modern management in Czech microeconomics sphere. Newly privatized firms and other organization asked for our participation in the rethinking and redesign of their managerial systems, incl. IS/IT. At the same time they required managerial simple and for industrial practice understandable methodological recommendations.

Confronting our positions and needs with several concepts of IM in the world - we soon declared our adherence to the managerial priority for the use of IM (correspondence to the "third stage of development"). Further the need of system approach was stressed - as a substantial help for the right formulation and solution

of managerial tasks. In this sense **under the term of IM we understand the appropriate use of modern means and methods of information technology and system approaches for coping with information needs for managerial activities**. Effective as well as efficient information processing are considered as important requirements posed on applications of IM.

In our concept **IM represents the transdisciplinary intersection of three principal components. They are: management, informatics and system approaches (system analysis and synthesis)**. Due to character of specific applications knowledge from some other additional components may be integrated, for example from economy, marketing, financing, pricing, psychology, sociology, operation analysis, politology, etc.

For its use is **IM considered as multifunctional**. The significance of individual components is not considered only from the position of the their partial professional contributions, but in the new synergetic quality of a whole IM given by their goal-oriented integration.

By being brought into a new relation with one another, management, informatics and system approaches have undergone varying degrees of modification for their creative use. It enables sometimes new formulations of managerial tasks, new ways of their solution and interpretation of results (for example integration effects trough different types of coordination in organizational structures, process integration trough BPR, effects of structural mergings).

Due to the extend of our paper, the more comprehensive insight into individual components and the ways of their synthesis will remain outside further explanation, but was already published (Vodáček, Rosicky, 1997). Informatics as the key innovating agent in modern management plays the leading role for the effective and efficient performance of managerial functions, roles or "critical factors". Attention is paid to the growing impact of information processing in transforming managerial theories as well their practical applications. The new managerial environment is being reflected, for example on the background of P. Drucker's ideas about "knowledge based society" (Drucker, 1990), "learning organization" (Senge, 1990), "organization learning" (Argyris, 1992), MIT Study about the corporation of the 1990's (Scott Morton, 1991) or "intellectual capital" (Edvinson, Malone, 1997).

In solving practical tasks we do not use only classical structural arrangements corresponding to frameworks of managerial functions, but with growing frequency the up to date systemic concepts defining "critical factors" of particular problems.

3. Teaching of IM

Our concept of IM was in principle worked out in 1992 and gradually in following years partially innovated, tested and applied for the solution of several managerial tasks, particularly on the microeconomics level. At the same time corresponding courses were introduced at our Prague Economic University and later on some other Czech Universities too.

The starting course of "Introduction to Information Management" (in the 3. year of study) provides students with understanding of principles of IM. It stresses the role

of IM, its transdisciplinary character and systemic approach to the integrative use of applied disciplines.

In further two years parallel to the detailed course of "Information Management" there are **obligatory courses** of

- Management Information Systems,
- Methodology and Analysis of Systems,
- Decision Support Systems,
- Management of Projects and their Economy,
- Innovation and Design of Systems,
- System Analysis (Seminary 1 and 2).

Corresponding to their interest and needs students have **elective courses** too, for example

- Information as an Economic Resource,
- Natural Thinking and Artificial Intelligence,
- Managerial Communication,
- Theory of Information,
- Design of IS/IT.

The names of the courses mentioned above present a rough idea about the contents and structure of the teaching process. For providing reasonable flexibility and respect of individual preferences of students the credit system has been applied.

4. Applications of IM

The concept of IM as worked out by our Department of System Analysis has helped us substantially in working out the set of systemic recommendations for the solution of different acute and complex managerial tasks. They were used not only for pedagogical purposes in our courses, but primarily for consulting activities of our department in collaboration with Czech macro- as well as micro- economic practice.

Typical tasks being solved with the help of IM methods were problems corresponding to rather complex socio-economic systems (the higher half of Boulding's taxonomy levels). They included

- factory planning systems based on IS/IT,
- design of integrated production management systems,
- design of strategic alliances and other forms of integration of Czech and foreign firms,
- applications of business process reengineering (BPR),
- strategic restructuring of Czech industrial firms.

In order to illustrate in more detail at least one application of IM we would like to mention our methodological approach to the task of **strategic restructuring in Czech industrial firms**. The first reason for selecting this problem is, that strategic restructuring can be considered at the present time as the key task of our microeconomics transformation process. At the same time - and it is the second reason for our choice - the example provides good opportunity for the presentation of the typical spectrum of methods and approaches being used in IM (modeling, application of hard- and soft- approaches, application of modern management thought stressing the new roles of IS/IT, etc.).

Strategic restructuring has been defined as the **qualitative transformation (innovation) of inputs, outputs and structures of an industrial firm in order to meet the goals of its business**, and to cope with this task in compliance with economic requirements **of effectiveness and efficiency**.

In difference to many "practice-oriented" recommendations existing in the Czech Republic our "integrated approach" strictly differentiates the contents and goals of strategic restructuring, from partial restructuring processes. It is known, that the present restructuring effort of most Czech industrial firms has been wrongly focused only on financial restructuring or/and organizational restructuring. This has led to non-systemic solutions and caused further economic difficulties in factories, as well as the Czech economy as a whole.

The set of structural arrangements being appropriate for the analysis and synthesis of restructuring process has been identified as

- production program structure,
- production base structure (production structure),
- information structure,
- functional structure,
- organizational structure,
- personal (professional and qualification) structure,
- financial structure.

Individual structures are considered as mutually interlinked, have mutual positive or negative impact (intercorrelations). In the restructuring project and during the restructuring process the methods of IM for their harmonization are used. At the same time these fundamental structures might be extended by some specific structures, like R&D structure, innovation structure etc. Functioning of all structures is to a certain, but different degree affected by their internal and external environment (social, economic, technological, market, legal, cultural and even other "impact factors").

Making analogy to concepts of "critical success factors" (Vodáček, Vodáčková, 1996) or "components of organizations" (Scott Morton, 1991) **we have proposed for our Czech firms 4 mutually interlinked factors, which we consider as primary important for the process of strategic restructuring** (strategic concepts, projects). They are

- **business activities firm is and will be engaged** in (including primarily the production program structure and production base structure),
- **organizational methods, structures and processes** creating rational order and forms for the functioning of a firm (including primarily the functional, information and organizational structures and processes),
- **methods and systems of information processing**, as instruments for coping with the requirements of selected critical factors (including primarily the activation of structural elements and their ties in the systemic whole),
- **human factor**, as the integrative element for the effective and efficient realization of previous three tasks (key role of personal structures with their "soft-characteristics").

In order to be easily understandable and acceptable to the majority of Czech top and middle managers the choice and formulation of factors has preferred simplicity. At the same time the necessary integrated processing of these factors can be easily interpreted as the **unification of content, forms and instruments of managerial activities with the key role of people**. Factors and work with them was formulated in the set of understandable recommendations corresponding to the modern IM progress and corrected with regard to the feasibility in conditions of Czech firms (alternatives). It has been described in detail (Vodáček, 1998).

The clear system arrangement of the restructuring process provides the good starting point for the qualitative innovation of former business activities. It facilitates modeling, integrated redesign and integrated management of core and supporting business processes through BPR methods, as well as clear statement of their value metrics (Johansson, 1993).

The application of IM (primarily due to IS/IT and BPR) in restructuring effort of business processes allows to use the information simultaneously in as many places as it is needed. With the help of computers and telecommunication networks it allows to have the same information at the same time in as yet locally separated organizational units. It makes possible to use methods of management by objectives (MBO) and to participate on the solution of local as well as global problems. In other words it facilitates to combine benefits of centralization and decentralization - one of constant challenges of Czech industrial practice.

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