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**DEVELOPMENT OF METHODS
AND TECHNOLOGIES
OF INFORMATICS
FOR PROCESS MODELING
AND MANAGEMENT**

Editors:

**Jan Studzinski
Olgierd Hryniewicz**



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This book consists of papers describing applications of informatics in process modeling and management and in environmental engineering. Problems presented in the papers concern development of methods supporting process management, development of calculation methods for process modeling and development of technologies of informatics for solving some problems of environmental engineering. In several papers results of the research projects supported by the Polish Ministry of Science and Higher Education are presented.

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CHAPTER 1

Process management and management tools



NEED FOR A POLICY AND STRATEGY FOR INFORMATION IN A MODERN ORGANIZATION

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Abstract: *For at least a decade we have lived in an environment of a constant and dynamic change. The Internet revolution accelerated this process so considerably that today a new stage of the information revolution is being predicted. An essential paradigm shift touches also the area of IS/IT. There is a much stronger need for an efficient information management function in a modern organization. This should lead directly to a proper information policy and information strategy for the business.*

Keywords: IS/IT paradigm shift, information management, information policy, information strategy.

1. Introduction

The substantial and dynamic changes that we have experienced in the last decade, i.e., the Internet revolution, the growth of dispersed collectives, the virtualization of human activity, etc., require that the world of business takes all necessary steps to keep in pace and adjust. In the 1990s Business Process Reengineering entered the corporate stage and remained there for good. If not always in the proposed, comprehensive and painful manner, but surely as an innovative way of thinking in terms of sound information processes. But then came the Internet. Change became not only constant, as M. Hammer and J. Champy predicted, but also rapid and hard to follow, indeed.

This article tries to revisit the main issues regarding a proper policy and strategy for information management in a modern organization. It briefly describes the main determinants of the paradigm shift in the information technology/ information systems (IT/IS) area and describes the key drivers of this historic phenomenon. Then, it introduces a new concept of the Information Management Function, which can significantly help formulate an effective information policy and strategy of an organization. Last but not least, the article identifies the main risks and losses that information policy can help to avoid, and also chosen benefits which information policy can help to promote.

2. Paradigm shifts in the IT/IS area

The paradigm shift currently being experienced by the information technology/ information systems (IT/IS) area demands a radical business reappraisal since, as with any other paradigm change, our view of what is real has changed. The information revolution may be entering its second stage, Figure 1.

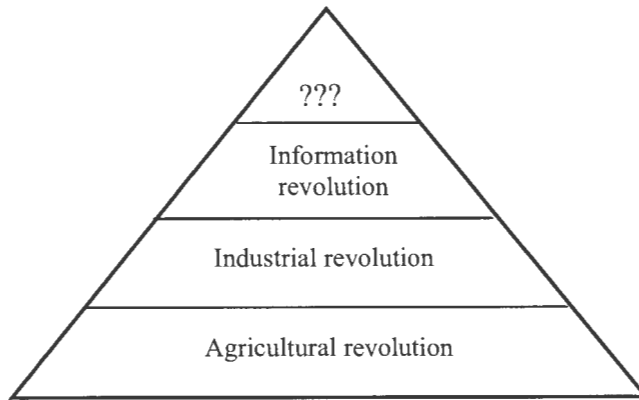


Figure 1. Paradigm shifts.

Source: Own research

But it is not only IT/IS that experiences such paradigm shifts. Tapscott and Caston (1993) identify four forces for openness that drive this technological change (Table 1). These forces are:

- New technology,
- New geopolitical environment,
- New business environment,
- New enterprise.

Table 1. Four forces for openness.

<p>New technology: New goals for IS Open, user-oriented, networked computing</p>	<p>New geopolitical order: open, volatile, multipolar world</p>
<p>New business environment: Open, competitive, dynamic market place transforming into market space</p>	<p>New enterprise: open, networked, information-based organization</p>

Source: Bbased on (Tapscott and Caston 1993)

As a result of this paradigm shift there have been three critical moves, as the use and management of IT/IS is concerned:

- From personal to work group computing,
- From island systems to integrated systems,
- From internal to enterprise computing.

These changes and their enabling technologies are shown in Figure 2.

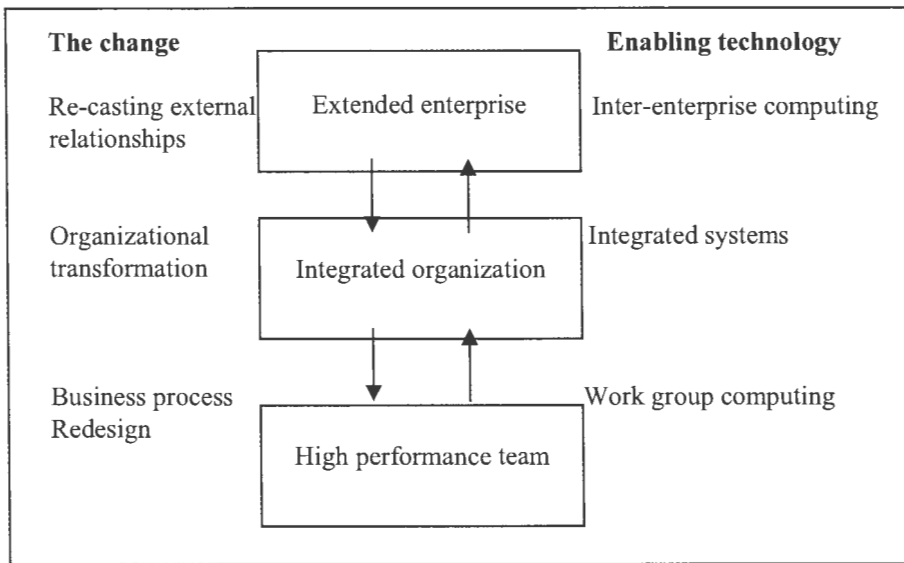


Figure 2. IT/IS critical changes and enabling technologies.

Source: Based on (Hinton 2006)

3. Key drivers of the IT/IS paradigm shift

M. Hinton (2006) identifies seven key drivers to the information, information systems and information technology paradigm shift. They are:

- Productivity of knowledge and service workers,
- Quality,
- Responsiveness,
- Globalization,
- Outsourcing,
- Alliances,
- Social and environmental responsibilities.

Productivity of knowledge and service workers. IS is needed to automate this area in order to achieve productivity gains of any significant size. Such produc-

tivity gains can be from either lower costs or higher performance and IS permits the development of new high performance work models.

Quality. Product and service quality programs are increasingly information-based and not production-based. The key issues are consistency and predictability and these are ensured by the employee motivation, supplier involvement and performance measurement enabled by IS. Countless works focus upon the issue of quality and TQM.

Responsiveness. It is now essential for any business to respond fast. The new global markets demand that organizations become far less time and space dependent. The time lag between opportunity and action is the key to opportunistic strategies – “better never than late” sums up the costs of missing the opportunity time. Time, and related responsiveness, was arguably the key to competition in the 1990s.

Globalization. This key driver is often associated with mergers, acquisitions and alliances that are responses to the world economy created by the removal of national shelters for inefficiency. The alternatives of either operating from “home” and treating overseas as sales and service colonies for standard products with the resulting economies of scale, and undifferentiated goods versus tailoring to local conditions with the resulting duplication of effort and resources, can now be replaced by a third approach which is to treat the world as the marketplace (or market space in the cyberspace). The organization may manage regionally and locally as always, but these “regions” are independent of physical restraints and it is advances in production and communication technologies that support this globalization.

Outsourcing. There is growing concern to focus upon the key areas of business, those of key value-adding capability and hence a refusal to dilute the management attention given to these areas. The technical infrastructures that support the extended enterprise’s links to its customers and suppliers also support the move to outsourcing. Organizations “stick to their knitting” and, rather than seeking self-sufficiency, go for streamlining with key suppliers, alliance partners, support organizations, etc. Many organizations restructure themselves into a “shamrock” organization (Figure 3), where a core of qualified professionals, technicians and managers are the focus of the resources since they represent how the organization competes. They have the role of developing strategy, analyzing problems, planning and communicating. This core is flanked by outsourced key services and a flexible labor force. The use of part-time, temporary workers and the outsourced key services demands a far greater reliance upon IS to manage this more complex relationship web.

Alliances. These often occur between organizations that previously had nothing in common. These extended enterprise takes many forms, from research consortia to shop-bank link-ups. The role of technology in these alliances is ambivalent. While technology supports enterprise-level collaborative work just as it does individual and work group level collaboration, the constraints of technical “Berlin walls” are being felt far longer than the survival of the actual wall.

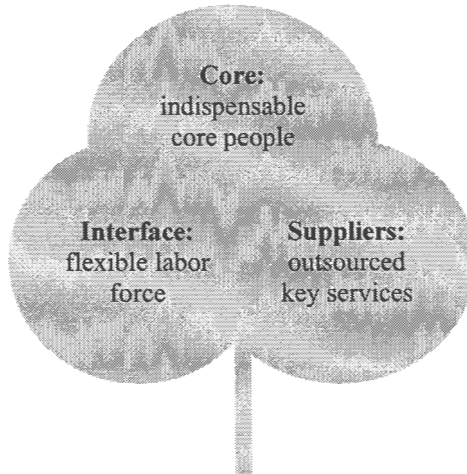


Figure 3. The shamrock organization.

Source: Own research

Social and environmental responsibilities. The “me now” selfishness of the 1980s drove a backlash leading to a significant rise in social awareness making the 1990s the “decency” decade. The organizational rise of empowerment and autonomy demands respect for the individual and these individuals now demand a stake in the success of the organization and appropriate tools in order to help achieve it.

4. The need for information management function

Information Management (IM) is defined as a conscious process by which information is gathered and used to assist in decision-making at all levels of an organization (Chaffey and Wood, 2005).

According to this definition, true information management is a conscious process. IM does not just happen, it has to be thought about, planned, systematic and well-structured. Secondly, the purpose of IM is to assist in decision making. Information management therefore works best when the conscious planning process starts not with information but with the decisions that have to be made. This is along the line with the inductive thinking proposed by Business Process Reengineering – sort of trying to turn the whole situation around, and start from the different end.

Thirdly, IM is for the benefit of all levels of an organization. In many organizations, IM is perceived as being a control mechanism for the benefit of senior managers or shareholders. But it should be as much about aiding decision making across and between all levels of the organization.

Last but not least, the above definition makes no reference to computers or information technology. It is a commonly held belief that information is essential to all organizations, but that skilled people are the most important asset, regardless of

organizational goals or industry sector. Indeed, as we move into a more information intense environment it is the combination of people and information resources that will deliver superior performance and competitive advantage.

According to C. Frenzel (1999), the leverage of information and people is so powerful that managers in high-performance organizations devote considerable energy to managing information, its delivery system, the people who deliver it, and those who use it. The combination of skilled people and advanced IT has revolutionized the concept of management.

This, in turn, is along the line with the basic definition of an Information Systems. According to this very useful approach an information system is defined as a system which assembles, stores, processes and delivers information relevant to an organization or to society (Avison and Fitzgerald, 2003). The authors of this definition stress that an information system is a human activity (social) system which may or may not involve the use of computers. It is evident that, regardless of an approach, a social subsystem (people) makes a basic, subjective element of every IS.

At the same time, however, a widespread misconception about IM is that it is only concerned with information technology management. It is true that some of the concerns in the IT area do form part of the IM agenda. Nevertheless, there is a plethora of wider issues concerned with managing much broader information resources which transcend the narrow focus on simple technology management.

M. Hinton (2006) defines an information management function as one that has responsibility for maintaining expertise sufficient to assist individuals, groups and other functions in their information management to provide integration across the organization and build and maintain the corporate information infrastructures necessary to for integrated information processes.

The information management function has a special expertise for business process and system development. A unique role of information management is integration, both in development and information operations. This cross-functional, integrative role makes information management very broad in its domain of interest, dynamics and demanding. So, the role of information management function is no longer seen in isolation but is intertwined with that of the other organizational functions.

The structure of the information management function can vary greatly depending on an organization's culture and the characteristics of the industry sector it is in. This leads us directly to the issue of information policy and strategy in a modern organization.

5. From information management to a policy and strategy for information

The paradigm shift in the IS area creates both opportunities and dangerous challenges. If the knowledge organizations need and the information resources they

need to keep their knowledge in good health are so extensive in range and so specific and individual in content, the management of them must be based on a clear policy. The investment of effort in developing first a policy and then a strategy for using knowledge and information can bring both avoidance of dangers and positive benefits.

There are many dangers associated with a lack of proper information policy. For example, T.H. Davenport (1993) suggests that as much as 85 per cent of the important information in organization is too unstructured to be captured or distributed electronically – and argues from this against the common managerial assumption that information acquisition, analysis and distribution is low-level work.

Table 2 presents the most common risks and losses that a proper information policy and strategy can help to avoid.

Table 2. Risks and losses that information policy can help to avoid.

Situation	Consequent risks and losses
Uncoordinated information systems and information activities	Incomplete exploitation of information, anarchic use
Information activities controlled by people with restricted understanding of organization and information	Important kinds of information overlooked entirely, or managed without professional skills to exploit them
Inappropriate information activities; inappropriate formats for information	Organization wastes time on things it no longer needs to do; people's time wasted in disentangling information they do need from inappropriate presentation
Poor communication of essential information for creating organization's offerings	Failures in attempts to innovate
Systems and IT investment without strategy related to overall business objectives	Systems and IT cannot make maximum contribution to core competencies of organization
Not possible to bring together relevant information from different sources	Bad decisions, missed opportunities for initiatives, losses
Managers do not fully understand what they need to know to foresee dangers, how to make good use of it	Inability to anticipate and respond appropriately to internal or external threat
Organization does not understand the importance of accurate and ethical use of information in dealing with its outside world	Loss of reputation, of customers, of money in compensating and rectifying

Source: Based on Hinton (2006) and Unold (2005)

One of the most vivid examples of the lack of managers' inability to anticipate and respond appropriately to internal or external threat and lack of ethical use of information (situations 7 and 8 in the table) is the current situation of an American pension system, which is in a real danger of a total collapse (Barlett and Steele, 2005). This is an example of a significant macroeconomic slip-up, caused by an inconsistent and non-integral information policy at the highest government level.

For decades American employees believed the corporate promises about retirement and health care, often affirmed by the Federal Government: guaranteed pensions, company-paid health insurance, company-paid supplemental medical insurance after turning 65, a modest life-insurance policy. Today, business in one industry after another are revoking long-standing commitments to their workers. Result: a wholesale downsizing of the American Dream. Policy decisions by Congress favoring corporate interests over workers will drive millions of older Americans into poverty. Congress's role has been pivotal in this process. Lawmakers wrote bankruptcy regulations to allow corporations to scrap the health insurance they promised employees who retired early. They wrote pension rules that encourage corporations to under fund their retirement plans or switch to plans less favorable to employees. They even denied workers the right to sue to enforce retirement promises.

This process accelerated dramatically in 2005. Two major U.S. airlines – Delta and Northwest – turned to bankruptcy court to cut costs and delay pension-fund contributions. This followed earlier bankruptcy filings by United Airlines and US Airways, both of which jettisoned their guaranteed pension plans. Other sectors followed suit. From 2001 to 2004, nearly 200 corporations in the FORTUNE 1000 killed or froze their defined-benefit plans. Most recently, Hewlett-Packard, long one of the most admired U.S. companies, pulled the plug on guaranteed pensions for new workers, concluding that pension plans are a thing of the past.

This is also an example of one of the many aspects of shifting paradigms in today's world. At that point, individuals will assume all the risks for their retirement, just as they did 100 years ago.

On a brighter note, there are many benefits an organization can gain from a proper information policy. Some of them are described in Table 3.

Table 3. Benefits which information policy can help to promote.

Situation	Benefits promoted by information policy
Integrated information activities	All resources of information can contribute to all organization's objectives
Information policy integrated within corporate policies and priorities	Decisions about resources for information activities can be taken in relation to how they contribute to corporate goals
Policy embodies criteria for assessing how information contributes to achieving organizational objectives	Off-the cuff decisions to cut information resources become less likely, because likely effects can be predicted
Policy brings together distributed knowledge of all information resources and activities	Promotes cooperation, negotiation and openness among people responsible for different aspects of information management
Information flows more freely	Innovation, productivity and competitiveness are better supported
Options for investment in systems and IT can be evaluated in relation to key organizational goals and to what people need to do with information to achieve them	Basis for sound systems and IT strategy, supporting corporate goals and allowing productive use of technology
Intelligence gathering and constant monitoring of internal and external environment as part of information policy	Not only timely response to change, but chance to initiate change so as to take advantage of changing environment

Source: Based on Hinton (2006) and Unold (2005)

6. Conclusions

Information policy and strategy are too important for the well-being of the organization to be left to a limited group of people, or developed without close attention from top management and/or board level. The process should involve everyone who manages resources of information which are essential to the organization in the light of its definition of what it is in business for; the senior managers to whom they are responsible; representatives of "stakeholders" who use or contribute to the resources; and those who manage the systems and technology which support people in doing things with information. And it should be under the aegis of the top management team.

This is in line with ideas advanced recently about the value that can be created by diffusion of responsibility for knowledge and decision making throughout organizations, rather than concentrating it at the top.

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The purpose of this publication is to popularize application of informatics in process modeling and management and in environmental engineering. The papers published are thematically selected from the works presented during the conference '*Multi-accessible Computer Systems*' organized by the Systems Research Institute and the University of Technology and Agriculture in Bydgoszcz for several years already in Ciechocinek. Problems presented in the papers concern: development of quality and quantity methods supporting the process management, development of quantity methods for process modeling and simulation, development of technologies of informatics for solving problems of environmental engineering. In several papers results of research projects supported by the Polish Ministry of Science and Higher Education are presented.

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