



## 2<sup>nd</sup> International Conference of "Research and Education"

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### THE ROLE OF INFORMATION TECHNOLOGY IN BUSINESS PROCESS REENGINEERING

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Nowadays Information Technology (IT) and the appropriate application of its means play a key role in the managing of modification, analyzing of processing, and actually in the whole process of changing. In former years, everyone was convinced that work performance would be boosted up by the appearance of Personal Computer (PC) and the power of Distributed Database. Nevertheless, belief in computers has not fulfilled the expectations. Knowing such antecedents how could executive and operative staff now believe that IT is able to change and ease their lives? There was a substratum of truth in all the predictions about computers, only their implementation lingers. There is a delay between theory and the application of results. One reason of the delay is the time that is needed for the supposed users to understand, what is available. The same could be observed like at the debut of internal-combustion engine, telephone, radio, and airplane. IT also followed the traditional way. As primitive cars or railway vehicles were designed like chaises, similarly first computers were copies of the original typewriters. In the '80s, the purposeful usage of computer technique was not typical; mostly it was used for data storage and for heavy computing.

The '90s were a real breakthrough in the usage of informatics. There came the time when these customs were ceased, and IT started its own technological innovation. Business life was able to understand, that these systems were not only suitable for complex computing, but also for communication and for the managing of information flow. Every similar organization is based on linked task-execution and communication. Advanced technology makes total reengineering, redesign, and reshape possible in this way. At the same time the role of IT professionals is altering and expanding.

#### PROCESS MODIFICATION

Enterprises are constantly trying to re-invent themselves. Planned, controlled change (hereafter: change) describes the systematic process of introducing new behaviours, structures,

and technologies needed to solve organizational problems. Behaviours approach focuses on the change in knowledge, cognition, and the attitude of people; it can often involve the improvement of communication, group-behaviour, interaction between groups, management practice, and the change of power relations and organizational culture [French-Bell, 1984]. Structural approach focuses on the reengineering of organizations and workplaces or working conditions. According to the technological approach the change of devices, methods, material, or technique is necessary; for example through the redesign or reorganization of the workplace or reengineering of the work processes.

Since the size of solvent markets is constrained in the short term, thus competition for taking the biggest slice of this market and the spending power are heavily increasing. Enterprises almost have to race for gaining the goodwill of the customers. To maintain competitiveness, real-time processing of information on workflow is getting more and more important, since this is the key to the quick intervention in the process: the regulation. It is important in the same way in case of information concerning the outer world, the economical environment, and the market. The question for managers is how the enterprise should be transformed in a way that it will be able to apply the new strategy whilst it modifies the performance of the management and the staff in that way, so that it gradually becomes better and adapts itself to the new circumstances. Rummler and Brache [1990] argue that the efficiency of an enterprise depends on the efficiency of its processes and methods. For the management to understand how a task is completed by the company and how it affects the quality – the business processes should be investigated. This is a hard duty because the single processes are not visible, and they are not in the organization chart, and in general, the desirable performance level is not known, either. As a result, it is seldom measured and inadequately managed.

Most business processes are not consciously designed but developed during the times, adjusting itself to the momentary external circumstances. In many cases the “developing power” was only the control, not the simplicity, flexibility, productivity, or throughput time. This often appeared in the “overpopulated”, amazingly bureaucratic organizations, where the control as an initial motive has lost its significance. Consequently, nowadays there is a fairly large sphere available for reengineering managers. [Hammer-Champy, 1993]

In the '90s, one can encounter a lot of methods and procedures concerning process modification, and organization-control systems based on it (CPI, reengineering, etc.). [Dobák, 1999]

It can be stated generally that information technology (IT) can play an important role in process reengineering. An enterprise that is not able to change its point of view concerning its information system cannot be successful in reengineering.

## INFORMATION TECHNOLOGY

Information Technology refers to the computer hardware, software, and communication tools, which are not only able to store, process, and query information, but their work is also to display and produce it. Information systems connect IT with data, the procedures suitable for processing them, and the persons who collect and use these data. Individuals use the information system to collect, store, process, and retrieve information, and to communicate. Information systems help managers to manage information effectively and efficiently, and make large amount of information available comparatively fast and with relatively low cost. Where

sometimes some kind of clerks sent invoices, registered payments, managed customer complaints and questions, now there is a computer system making it possible to retrieve and refresh any part of the customer database.

Manufacturer industry also applies computers in order to gain higher flexibility. Dirty or dangerous works were earlier executed by workers could be performed by robots, e.g. painting the cars. IT can operate in a perfect way and support the enterprise in such traditional industries as furniture industry (“Balaton Bútorgyár”, a Transdanubian furniture factory could be a fine example). Immediate manufacturing has become popular, where modular manufacturing equipments and computer control make fast tool re-equipping and manufacturing-order reset for new products possible.

These applications make it possible for organizations to widen out their particular activities by making information easier available for workers and by supporting the increased autonomy and responsibility. Nowadays, conceptions on IT development and implementation are getting higher priorities in many organizations.

## Practical utilization of IT

The real power of IT lies behind its capability to be able to process data in order to produce information that is storable and retrievable. Managers use strategic information systems to support decision making, to improve their sale and marketing capability, and to promote their adaptability to changes.

IT makes fundamental changes possible in the way of work, which results in the redesign of the work process. E.g. robotics have changed the physical manufacturing; data collecting computers have changed the data processing work, and CAD/CAM devices have influenced and are still influencing the designing of new products. [Gordon, 1996]

On the other hand IT produces a change of the competitive environment in many branches of industry. Some big chains of department stores, for example, apply information systems for the suppliers to fill up their warehouses only with the immediately needed goods, in order to keep their costs low (e.g. “Metro” or “Julius Meinl” in Hungary). IT renders it possible to integrate business functions on every level, inside and among organizations. E.g., Just-In-Time store-keeping control method places stock in the plant where they are used, and in a quantity that can be utilized within one or three days, instead of stockpiling a great amount of goods in a centralized place for future use.

IT means new strategic possibilities for organizations that reevaluate their mission and functions. Automation can provide new products for the organization to sell. E.g., several airlines developed or brought to the market seat-reservation systems that they passed over to travel agencies to make bookings. The same happened in the field of medicine wholesale in Hungary, where the ordering between distributors and pharmacies occurs via an online system. Information systems offered competitive advantage for societies by having reduced the cost of workforce, providing further information to the competition; and helping to transform organizations to face the changing environment more effectively.

Integrated information systems comprise the whole enterprise, and offer solution for harmonizing their processes, integrating the used data, and forming a unified language practice. The main structural feature of every information system is the modular construction, which has

the great benefit that the modules can be used independently; neither the sequence nor the time of their installation is defined. However, if several modules are installed, it is easier to handle them together. The systems are based on the functions covered by the main processes of the enterprise; these are what the modules support. The functional structures of the various applications are different, but it is typical for all of them that their modules are integrated and permeable. This results in the fact that one data can get into the system only at one place: at its input place. [Petró, 1999] The most important benefit of its application is the integration through the functional areas. All data is put in only at one place; and if any data has changed inside a module, then the system changes all dependent data in all dependent modules – like in a spreadsheet application. All groups of users have the same information at the same time. Moreover, every management level of the enterprise has simultaneously access to the required-content still clearly arranged information.

### Role of IT in Changing

The evolution of the technology and the switchover to personal computers (PC) has democratized IT; the limits between enterprise functions have been faded, suppliers and customers have gotten closer too. Hammer and Champy called this process the “loosening” role of IT. In their opinion, without IT it is impossible to radically reengineer business processes. [Hammer-Champy, 1993]

The application of networks and especially the spread of Internet made it possible for data and information to be available at many places at a specific time. Many people keep the role of IT omnipotent in reengineering, and form an opinion that it helps changes or makes it possible to reengineer or transform processes. Others consider it to be a mean by which business processes can be made more effective or which can help in the reorganization.

IT supports effectively, indeed, the preparation of reengineering processes and the planning of processes. For instance, graphical analyzer programs, the application of CASE technology helps the spatial planning of processes; by means of spreadsheets and cost analyzer programs the costs of particular processes and activities can be analyzed; database managers help to follow up the demands and complaints of customers; electronic “bulletin boards” can be used to collect the anonymous suggestions of colleagues. E-mail systems and programs supporting teamwork (groupware) are efficient to surmount the distances among geographical and organizational levels, and to coordinate communication. [Füstös, 1998]

The rapid progress changes the application potential of the reachable information technology, nearly from month to month. This includes the change of approach in what is possible or what will be possible in one or two years. In business process reengineering the application of *IT has direct benefit* in the following areas:

- Helps the workout of the organization model with describing the organization or some of its parts, recording it in the documentation
- Helps in the optimal utilization of means and resources
- Can help in the workout, design, control, and documentation of work processes
- The organization model(s), the work processes and the required devices can be assigned together

- Data and results of the processes can be recorded, and become part of the means of the global communication
- The adequate information is available anywhere and at any time
- The recording of information happens in its origin
- Information not primarily belonging together can be related to each other
- Decision-preparation helping modeling and analyzing, graphical appearance of business processes are aids on all levels of the management
- The direct user becomes an important part of the process, the flexible device-system can offer a customized and situation fitting solution
- By the workout of relevant connection points, external information sources can easily be involved into the system, giving a proper base for the preparation of strategic decisions [Füstös, 1998]

Fine methodology and combination of IT means leads to the great possibilities of process-improvement or reengineering. Until now, IT was taken into consideration only in the point of view of processes automation. Some business process were planned and analyzed with the usage of IT possibilities. Actually, most business processes were developed before the appearance of the modern computers and telecommunication. On the other hand, e.g. the possibilities of Electronic Data Interchange (EDI) resulted in totally new processes in the field of ordering from suppliers (e.g. ECR project of Unilever, Pátkai et al., 1999); and distribution and marketing processes has been transformed in the wholesale trade stock-management. Indirect computerized diagnostic tools and telecommunication have changed some correction and maintenance processes. It is unquestionable, that IT can play a central role in the innovation of business processes, and it is difficult to reach significant improvements in the performance without utilizing its potential.

However, home experiences in this field are rather mixed. In Hungary, up to now, it happens as well that a large amount of the enterprises only use IT for performing subtasks. It also happens that IT is fully forgotten and the representatives of this profession are not involved in the reengineering and coordinating team. The reason for this is that the organization and the task it performs fall beyond the traditional manufacture and service processes, and not viewed as part of the value forming chain. Many high executives have a skeptical opinion about the work and efficiency of IT areas. Nevertheless, it is also a fact that this area is not able to show instant results, and the effectiveness of the investments is questionable. [Füstös, 1998]

### The Transforming Role of IT Professionals

Resounding business success can be expected only if the new information system is fitting organically into the reengineered business processes, thus it has a kind of catalytic function.

According to the traditional approach, users give their requests to the IT department according to their present knowledge, and get the solution. According to the new approach, users pass not only their concrete requests to the IT department, but the essence of the problem to be solved, to which IT-experts give not only one specific solution, but a set of solution possibilities which reflect IT possibilities concerning the problem. Analyzing these, the user can give its exact request. Researches also prove that the user requirements have been changed in several cases after they had got to know the existing IT possibilities. [Handó, 1994]

The duty of IT departments and professionals within Hungarian enterprises is highly transforming: in the future, they can be the initiatives or inventors of change, or part of the execution team. It is not efficient any more for the IT to interpret its duty as transforming the detailed description of the activities into feasible systems. IT professionals should understand the business strategies of the organization as a whole. They will be able to utilize their technical skills in the interest of realizing the future purpose of the enterprise only in this way. IT managers have to organize instructional conferences for the other managers about the question how IT could help to realize the strategy of the enterprise.

In addition to all these, IT has to play a key role in developing a flexible and massive infrastructure, for the enterprise to meet the future challenges. This involves fundamental rules on standards, operating systems, data references, and other factors. IT will be judged increasingly by its value-addition ability, and not by its process automation ability. IT function should develop an opened way of thinking.

Since in organizations, the number of process modification projects (e.g. CPI, reengineering) is increasing, IT has to work out its methodological and system development abilities fitting into the reengineering project. In the interest of supporting the reengineering process, IT professionals can have access to means as integrated database systems. IT professionals have numerous abilities that are needed in case of the reengineering projects. They can provide more than mere specialist knowledge.

It is of utmost importance for managers and the members of the reengineering team to see the way of technological progress in advance. It is a relevant part of the total process change, for managers and the team to be increasingly conscious of the degree to that technology can support their work. In the future, IT function should pay the same attention for communication and training as for system designing. This phenomenon should be approached as such a responsibility of IT departments that there should be no technical obstacle in the way of the non-technical persons using the power of the technology. The IT departments of various organizations prove the importance – to an increasing degree – of the way of that thinking, to which Total Quality Management (TQM) has also called an attention. Nowadays, TQM lace the way of process reengineering so deeply, that the “we are different ones” approach is not acceptable any more. IT functions have to help users to acquire the IT part of the processes. The IT department should wait for and ponder changes only when their clients come forward with their demands and complaints. It has to contribute to the processes to a greater extent. We should let it be active and sensitive to the user’s expectations towards changing and modification. IT has a key-role in continuous improvements.

#### DEVELOPMENT RESULTS

Developing information systems is not an easy task. It is not only a Hungarian experience that in the past decade many projects have ended unsuccessfully: exceeding the time and cost limits. It can be stated generally that IT departments are not famous for concerning the on-time delivery. On the one hand, it has the cause that they have difficulties in the communication with the users; on the other hand a certain part of delays is caused by the ‘technological’ position of the IT departments. Users prefer getting what they want in time, in 80 % of the cases rather than in 100% with one year late, when the product is obsolete, as well.

According to the data of a UN survey, the information system developing projects are far from reality. Therefore, 19 of 20 developments have not been carried out before the appointed deadline. Nine of 10 were more expensive than the plan. According to a home survey, in the beginning of the 90’s, only 2% of the information system developments were immediately usable, while 30% proved to be unusable. [Jánossa, 1998] These numbers speak for themselves.

By process engineering concerning the information technology, the following simple rules should be kept: on the one hand, the adequate staff must be provided from either outside or by educating further the internal professionals. [Füstös, 1998] Their knowledge, capabilities, insight, and experiments mean invaluable worth for the Hungarian enterprises. On the other hand, it is absolutely necessary also for this field to be involved in the continuous control system; and it is necessary also here to keep up with the recent solutions.

However, let us not forget that developing IT is only one part of the total solutions, though it helps the management to collect, store and analyze data more effectively, to communicate more efficiently, and to distribute information in a better way. Successful application of information technology requires also by itself the transformation of management- and organizational culture. One of the greatest challenges for the management is to lead their organizations through the transformation that is essential for the success in the globally competitive environment.

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