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Address: 6D Regiei Blvd.

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Tel: (+40)21-312.97.82

Fax: (+40)21-312.97.83

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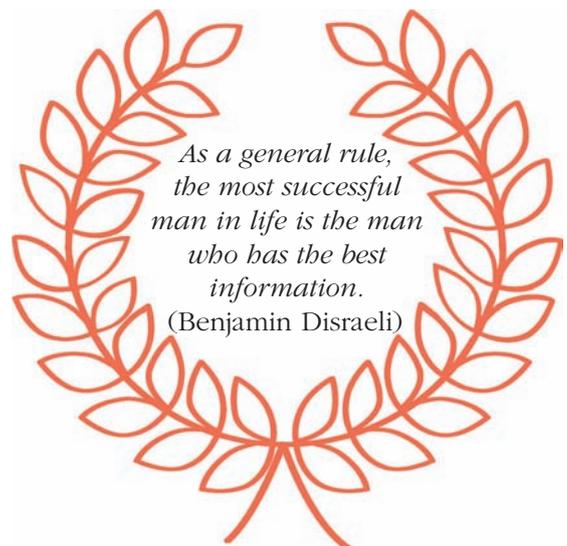
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Intelligent Management

Companies operate in a complex environment characterized by hyper competition, globalization of trade, radical technological change, requiring them to be aware at all times of this setting and potential changes. In order to have a chance to ongoing success, they must as well be pro-active and forward-looking in decision-making. The competitive race is becoming more intense each day, driven by the internationalization of the world economy and the integration of new information and communication technologies. For facing this race, the industrials have developed factors and processes, to allow their enterprises to be more competitive. Among these, the reader will likely be familiar with names such as „business intelligence” and „strategic intelligence”. The enterprises’ anticipative capacity represents the origin of the birth of a new function named „strategic watch” (SW).

Generally speaking, SW is the detection of signals and reasons for change and transformations taking place. According to *Royal Institute for Strategic Studies* (www.ires.ma) SW is based on the systematic collection, analysis and dissemination of relevant and reliable information essential for decision-making. It represents a competitive advantage for individuals and institutions that practice it. Originally applied only to technology, this practice (historically called „competitive watch”, „technology watch” and „technology and standards watch”) now also includes commercial and competitive environments, finance, and applicable laws and regulations. By using strategic watch, one can keep an eye on markets and new innovations, both of which are critical to a company’s success.

Nowadays, SW has applicability in a wide range of sectors and activities: technological transfer, research \ development, accessing a new market, investing on an individual or corporate basis, recruiting, and the list goes on. To make the right strategic decisions and seize opportunities that arise, it is important to know about all the events that might influence an activity as early as possible. You should know what your competitors may already be doing out there and take advantage of any available information. This essentially means gathering and analyzing information and using it to





help grow a business. It is considered that SW costs 5 to 25 times less than intensive internal research, especially when applied to the field of technology or other capital expenditures-intensive sector, requiring new equipment (*Business Development Bank of Canada*: www.bdc.ca).

Research is a vital element of an effective SW approach. Basically, one has to make sure that it is constantly uncovering new information that can help it stay competitive. It's also important that it is able to quickly review the overwhelming quantity of available data.

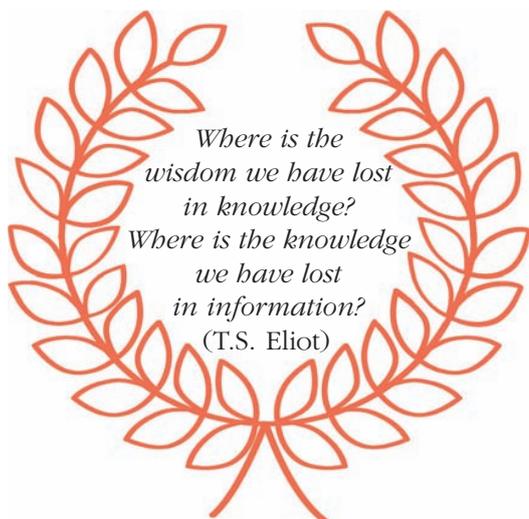
Strategic watch is an essential tool when used and applied appropriately. It allows individuals and companies to assess the market environment, to benchmark against

top performers and to save time and money when implementing best practice, thus getting ahead competition. However, there is clearly a lot of data out there, and care must be taken to have a clear focus of what the main purpose of each exercise is. By establishing priorities and key desired takeaways, one can focus on the relevant information only.

Furthermore, as this strategy is persistently and continuously carried out, one will become more efficient as it will have a better image and understanding of the market and where to find the relevant information (as long as it doesn't fall into the trap of complacency and is always mindful of the fact that things can, and do, change on an ongoing basis, at an ever-increasing speed).

Ultimately, it's important not to seek out technology/information at any price. You want to make sure your SW policy isn't too time-consuming, delivers results and makes you a stronger company.

*Cezar Scarlat
Senior Editor*



Performance Management – A Strategic Tool

Radu D. Stanciu

University „Politehnica” of Bucharest

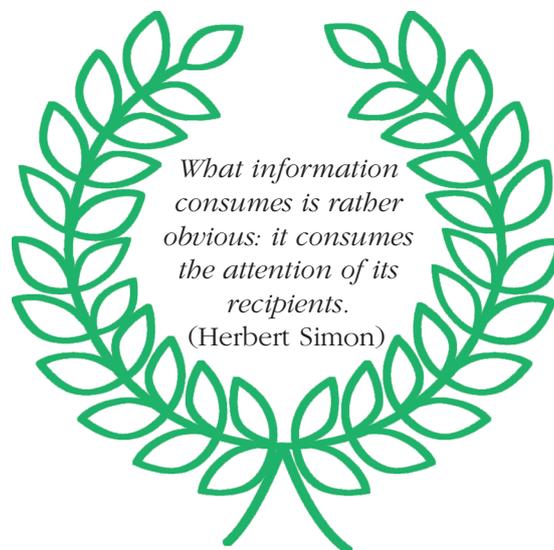
Abstract

At the world level, the human society confronts with an accelerated decreasing of resources. Today, you cannot speak about unlimited or sufficient resources, no matter the domain of activity. On the other hand, in a market with strong competition, the success and the stability of an organization depend on the way it use its available resources (materials, money, information, technologies, energy, and people). Its main goal is to have an efficient activity. Moreover, of course, the level of an organization's performance correlates with the level of resources usage. From those available resources, the most valuable are the human resources. The level of capitalization of the rest of the resources depends on the way each employee acts daily on his/her job. Practically, people are the only resource of an organization that cannot be measured in money. Using other words, an organization cannot exist without this special resource and, furthermore, its results crucially depend on employee performance, mostly on management performance.

Keywords: performance management, human resources, performance appraisal

INTRODUCTION

The experience of developed countries from the last decades emphasises the more and more important role the human factor plays in the growth or restructuring of the economy. The base of the amplification and acceleration of changes consists of the employees' attitude towards life, work, authority, the level of motivation and implication in those changes.





The analysis of human factor is necessary taking into consideration the central position of it in the society, both as production factor and consumer of goods and services. There is a biunique relation between those two aspects. Thus, the contribution of it to the increasing of social production depends, directly or indirectly, on the satisfaction of the material and spiritual needs of the society that influence the performance of the human factor.

The human factor represents the main source and resource for restructuring, economic growth and sustainable development.

In general, the human factor have to face different pressures: inappropriate stimulation and labour organizing, hard work conditions, poverty, unemployment, uncertainty, physical and moral degradation, etc. that lead to a significant decreasing of its performance.

Lack of motivation, tasks and attributions failure, interest decreasing in assuring of appropriate quality of goods and services, absenteeism represent some results of those injustices that could have

been anticipated and avoided. Those attitudes and behaviours affect costs and incomes, productivity, products and services quality, organization's profitableness and competitiveness.

Those findings, validated by the economic practice, lead to the idea that human resource management plays a central role in starting and developing of a business.

In the last decade of the last century, the specialists in human resources tried to emphasize the importance of this side of an organization to its general strategy, hoping for cooperation with the line managers and even sites in the management board.

Even if, in the large companies, those desires became facts, in the SME sector, especially in Romania, the HR activities consist mainly in doing wage calculi, recruitment based on recommendations or empirical annual appraisals.

However, at least in theory, HRM represents more than simple support activities. The managers from that domain must implement and deal with polices in recruitment, training, appraisal of the employees but also regarding the organizational culture.

1. The concept of Performance management

Not long ago the concept „performance management” was assimilated to performance appraisals consisting mainly in assessing the degree an employee fulfilled the task and responsibilities of his/her job.

In the modern approach performance appraisal becomes a part of performance management, a very complex process. This system consists also of defining the role of each department/individual, setting performance indicators and standards, com-

municating those roles, indicators and standards and, finally, creating a favourable environment for success.

From the beginning, the methods for setting objectives started from the idea that the individual performance will increase by focused it on setting and monitoring objectives achievement, and harmonizing individual development and rewards with the growth potential and development of new skills.

Performance management assumes that the increasing of individual performance will lead with the growth and new skills development potential to the improvement of organization performance, even if there is no clear link between them pinpointed so far.

„An organization which is good at performance management supports its people to achieve the organization’s goals” [1]

Only the practices from human resource management domain do not lead to a

certain level of organization performance but will contribute to the development of capable, committed, and motivated employees, who probably will exceed the necessary effort to fulfil their tasks resulted from their job description when they will have the opportunity.

A study from Bath University [2] defined performance management as one of the main policies of an organization. The results of the study allowed identifying five important factors that may influence the employees’ behaviour towards the attempted performance: manager’s respect, work satisfaction, career opportunities, training, and openness.

Most often, the human resource department designs the mechanism of the performance management but the line managers will apply it. Gradually, performance management became the most important management tool that allows managers to be sure that all the human





resources aspects from their activities are correctly interpreted. This allows line managers to be sure that their subordinates know what to do, have the necessary competences for that, and fulfil their tasks at adequate standard [3].

The human resource side of line managers role was investigated in a study conducted by professor John Purcell from Bath University and published in 2003 [4]. He found that the most important factor that influences the individual desire in obtaining performance is his/her relation with the line managers. He drew the conclusion that line managers play a crucial role in implementing the human resource policies, moreover the performance management. Starting from those findings he defined performance management as one of the most important processes that define the connection between human resource management and organisational performance. Therefore, this process becomes the main tool for running a business by significantly influencing the individual behaviour and directing it towards achievement of the strategic organizational objectives.

Researchers Allan and Susan Mohrman from Center for Effective Organizations, Marshall School of Business (University of Southern California) emphasized that per-

formance management means to run a business, what line managers do every-day [3].

In their book from 1998, the expert in human resource management, Michael Armstrong and his co-worker, Angela Baron from Croydon College defined performance management as „a process which contributes to the effective management of individuals and teams in order to achieve high levels of organisational performance. As such, it establishes shared understanding about what is to be achieved and an approach to leading and developing people which will ensure that it is achieved. ...A strategy that relates to every activity of the organisation set in the context of its human resource policies, culture, style, and communications systems. The nature of the strategy depends on the organisational context and can vary from organisation to organisation” [4].

In other words performance management must be efficient (be sure that employees have the necessary competences for performance), integrated (assure the connections between different aspects of business, human resource management, individuals, and teams), and strategic (refer to long term objectives).

The performance management helps employees to understand they may contribute to the achievement of the organizational strategic objectives and ensure the use of the most appropriate competences for activities useful to the organization, that have an important impact on its performance.

It is also a useful tool for line manager, helping them to lead their subordinates in an efficient manner, strongly related to the organization's objectives. Through it, the line managers make sure that their subordinates:

1. Know and understand their expectations;
2. Have the necessary competences to meet those expectations;
3. Have the support of the organization in developing their capacity to meet those expectations;
4. Receive the feedback on their achievement;
5. Have the opportunity to discuss and contribute to individual and group objectives establishment.

Therefore, the process must be clear and concise formulated, and use to understand for all those involved. Both, managers and employees, have to understand not only the way PM must be implemented but also what the reasons for its implementation are.

Furthermore, the activities and objectives of all the employees, no matter his or her position within the organization, must be lined-up to the organization's objectives.

Finally, anyone must be capable to understand the way the organization use the results and the benefits for it.

Two previous studies carried on by Chartered Institute of Personnel and Development from London came to the conclusion that today „performance management is a sophisticated and powerful tool that can't be separated from other management systems. In successful companies, it enables line managers to exercise their people management responsibilities effectively and get the best from the people they manage" [5, 6].

2. The process of Performance management

Performance management can be defined as „the system through which organizations set work goals, determine performance standards, assign and evaluate work, provide performance feedback, determine training and development needs and distribute rewards" [7]. That system has to be a self-adjusted and continues process, like a cycle (Fig. 1).

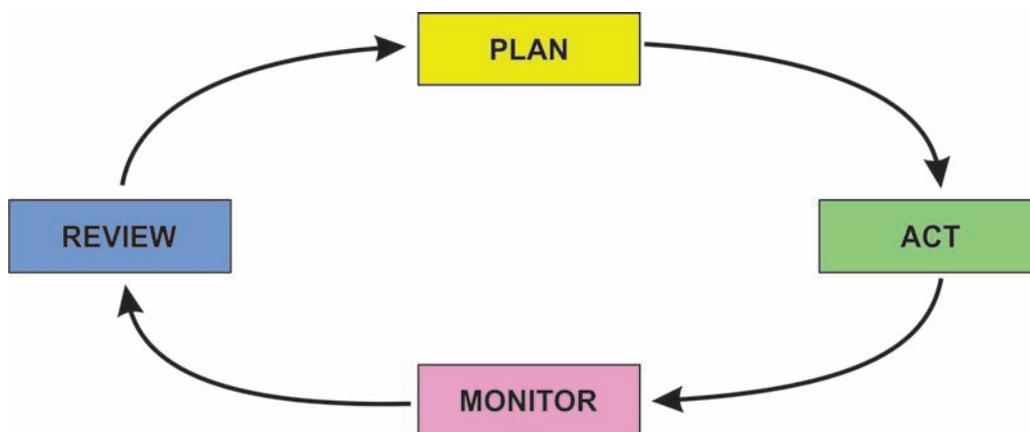


Figure 1 – *The Cycle of Performance Management*

In order to obtain the desired results, the system adjusts itself based on the information obtained in the previous step. Planning is the bases for actions and, based on the information obtained during the monitoring of the actions, the process review itself. This will lead to new planning and so on.

Michael Armstrong considers that „performance management processes are largely concerned with interactions between the parties involved but they also relate to what individuals do about monitoring and improving their own performance, measuring and monitoring performance, and documenting the outcomes of performance management plans and reviews.” [9]

The main activities of the performance management process are: planning of the performance and development, defining the performance, managing the performance during the year, and formally reviewing, analyzing, and measuring the performance.

The planning of performance involves an agreement between the manager and the employees regarding the expected results and behaviour. It also refers to the necessary competences (knowledge, skills, and attitudes) to obtain the expected results.

In order to define and measure the performance one may refer to key performance indicators (KPI). Corinne Leech defines them as „measures which help to monitor progress towards an objective or goal. They define key outcomes which need to be met if the overall objective is to be achieved.” [1]

Defining the KPI in the case of employees whose work is quantifiable is a pretty easy task because is about tangible outputs. This is not the case when talking about intellectual work. But one may overcome that difficulty if will make a distinction between outputs and outcomes. An output can be defined as a quantifiable consequence, while an outcome is a visible effect of an effort that is not necessarily measurable. Therefore, is easier to measure performance by comparing achieved with expected results.

More than that, Howard Risher pinpointed that, when talking about the performance appraisal, one may take into account also the inputs like knowledge, skills, and provable behaviour comparing with the prescribe performance standards [9].

In order to review, analyze and measure of the performance, one may use different performance appraisal methods. For gathering relevant information, managers have to answer some questions:

- Which is the purpose of the evaluations?
- What criteria should be use?
- What method fits the purpose of the evaluation?
- What evaluation errors can appear?



One of the main components of a performance management system is the feedback. Managers may deliver the feedback informally, during the whole year, or formally, as a component of the performance appraisal process. It can also be delivered by the co-workers, subordinates or even clients, as part of 360° appraisal.

One may do a difference between feedback and the performance appraisal. While feedback is based on information, performance appraisal refers to the judgment and the evaluation of it.

Because its importance, feedback must be efficient. Many times, when an employee received a negative feedback one may observe a decreasing in his or her performance.

Armstrong pointed out a guideline on providing an effective feedback [8]:

- Must be part of the job;
- Based on actual events;
- Descriptive not judgemental;
- Referring to and defining specific behaviours;
- Based on good work or behaviour;
- Asking questions then making statements;
- Focused on key issues;
- Focused on areas that may be improved;
- Provides positive and constructive feedback;
- Indicates necessary actions for developing performance.

There are internal or external factors that may disturb the organization's overall performance, like organizational environment, management style, and external social and economic environment, direct and indirect competition.

Therefore, performance management must permanently be a concern not only

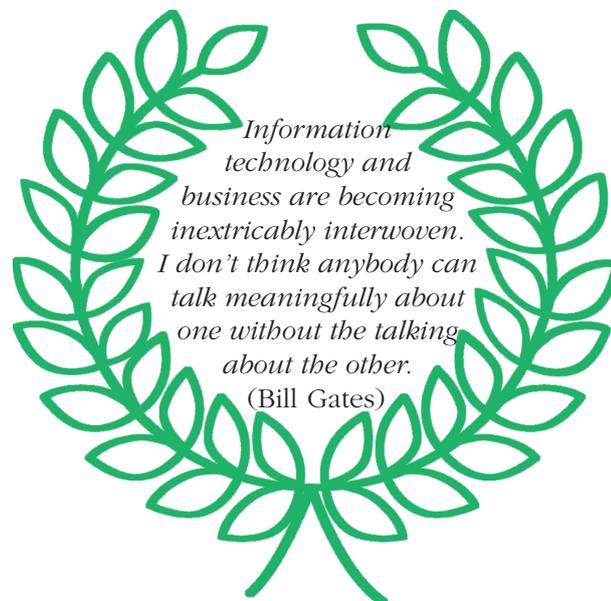
for the HR department but for the entire management team. It also has to take into consideration the general view not only the punctual problems.

Conclusions

Performance management is a powerful and complex tool that cannot and may not be separated from other management systems of the organization. In the successful companies, the implementation of such a system allows the line managers fulfil their tasks and responsibilities in an efficient way and obtain the best results from their employees.

Correctly implemented, the performance management can be a powerful tool for activities and efforts focusing which may improve the business performance.

The misunderstanding of its mechanism or a poor usage may lead to a weak involvement of employees, appearance of unproductive activities and an incorrect direction of the rewards.



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A Reference Model for Information Systems

Ota Novotný

University of Economics, Prague

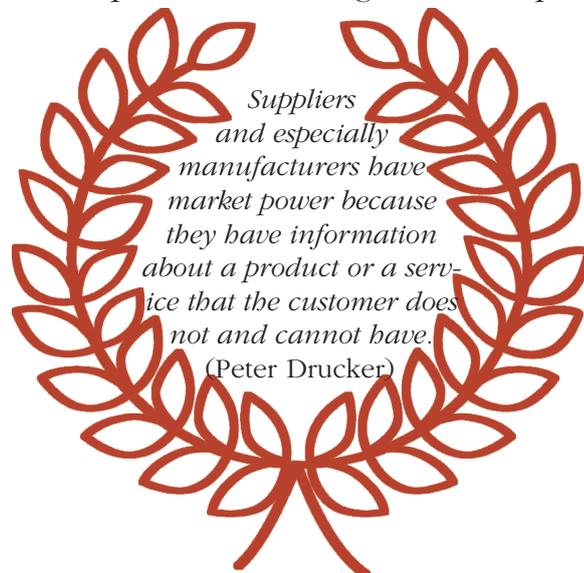
Abstract

The operation management category in information management is characterized by its improvement into the informatics management. It is in practice represented by IS/ICT Reference Models process descriptions, competencies and responsibilities. IS/ICT Management Reference Model is designed to maintain detail information about enterprise informatics structure and management (e.g. services, documents, licenses, management processes, measures etc.). The most important advantage of such model (compared to „traditional” metainformation systems) is that in the beginning of implementation does not contain empty structures, but „reference” content. The content represents in this context generalized knowledge („best practices”) of model developers in the area of IS/ICT management. Reference Models should play a key role during implementation or improvement of management processes in enterprise informatics. Implementation based on Reference Model is much faster and easier than traditional „building from scratch” approach. Then the implementation process of structured IS/ICT management using this Reference Model is discussed. Paper is finished by discussing the open issues to be solved in the future development of the Reference Model. Special attention is given to the open issues remaining in the implementation of the model.

Keywords: information systems (IS), information and communications technology (ICT), Reference Models, Information Management.

Information Management

Information Management as a relatively young discipline of the modern science represents new and very actual approach to management in organizations and enterprises as well



as to managing information systems and information and communications technology (IS/ICT). The general goal of the Information Management is to assure data for satisfying manager's information need as well as to realize so called data logistics – to transport relevant data to relevant persons in the right time.

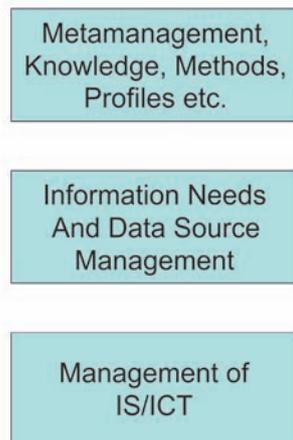
P. Doucek [1] defines following Information Management competencies:

- operational – characterized by its impact into the IS/ICT management and focused on IS/ICT metadata collection in an organization with final goal prepare data for effectiveness measurement and the IS/ICT effectiveness evaluation,

- tactical – characterized by planning and information need management with especially accent to managerial information needs fulfilling at the enterprise-wide level,
- strategic – characterized by meta-management on strategic level. The main service and mission of this competence is to manage, to plan, to forecast, and to teach top management in using related managerial tools.

Information Management is using tools as e.g. mathematical models, business intelligence elements and applications, decision support systems. Reference Models recently become a new member of this set.

Information Management competencies



Information Management toolset

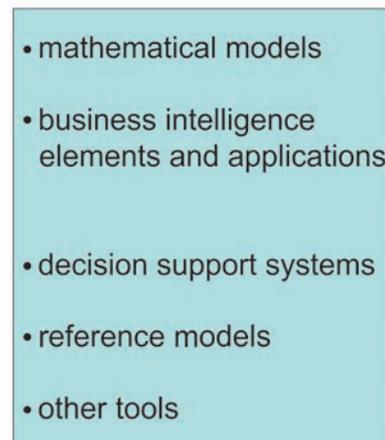


Figure 1 – *Information Management*

Reference Models are used by all competencies of Information Management. They contain relevant structures and relationships among the model elements (process structures, levels, document structures etc.) and also the predefined knowledge (best practice examples) already included in these structures. Reference Models are combining the strengths of the mathematical and data modeling techniques for

building its structure and knowledge management principles for management of this content.

Common application of Reference Models could be found in the area of the Business Process Management and IS/ICT Management. In this paper we will discuss their application in the IS/ICT Management.

Management of Information Systems and Information and Communication

Technologies (IS/ICT) in the enterprise becomes increasingly important and nowadays it is one of the critical success factor of any type of business. Application functionality overlap, technology and knowledge heterogeneity and constantly changing business pressures makes this task very difficult. There is a strong need for methodologies and recommended best practices in this area [2].

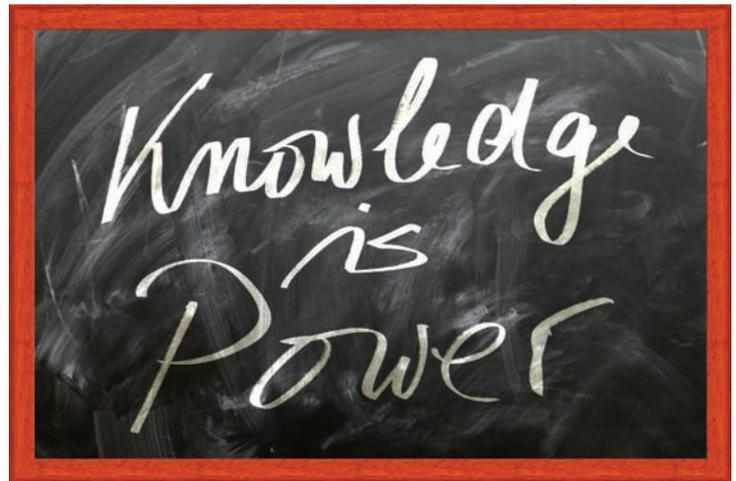
KIT Reference Model

The aim of the research of the Department of Information Technology, University of Economics, Prague (KIT) is to formulate process, data and organization models for efficient management and innovative development of IS/ICT. At the same time ensure that IS/ICT:

- correspond to solution needs of new complex tasks in the area of business, management, state and public authorities,
- efficiently and effectively support the working of processes not only inside organization and social subjects but also among themselves,
- take into account the changing user requirements for information and knowledge handling.

Therefore we decided to elaborate the Reference Model for the IS/ICT management using the same principles which were successful in the „traditional” business Reference Models subject areas described above.

The core of the KIT Reference Model is based on the service oriented approach to IS/ICT management [3]. It means that IS/ICT provides for the enterprise (for enterprise business processes) defined IS/ICT services, using the IS/ICT resources.



KIT Reference Model is provided as the standalone MS Access database application. It allows easy and fast implementation in any enterprise. In case the model is then used for regular IS/ICT management support, it is usually after initial analysis replaced by more robust database application.

KIT Reference Model contains (and tracks the structured information about) the following key components:

- Enterprise processes – information about business processes in the enterprise,
- IS/ICT processes – information about processes in IS/ICT,
- IS/ICT Activities – information about IS/ICT activities (parts of process flows),
- Services – information about IS/ICT services provided to enterprise,
- Applications (SW) – information about IS/ICT applications,
- Computer (HW) – information about the hardware,
- Users – information about users of IS/ICT services,
- Organization units – information about organization units in the enterprise.

KIT Reference Model also tracks the key relationships among the components. The structure of relationships allows IS/ICT manager to identify which organization unit is using the IS/ICT service and how many users (or computers) from the unit are using it etc.

It is obvious that for some components of the Reference Model (e.g. list of users or organization units) is not possible to prepare the common content, because they are different in each model implementation. Some components could be only partially filled by the generic categorization.

Following key components in the KIT Reference Model contain the predefined „best-practices” structure:

Fully predefined content (could be adopted without any amendments):

- IS/ICT Processes – IS/CT Process catalogue,
- IS/ICT Activities – IS/ICT Activities catalogue,
- IS/ICT Services – IS/ICT Service catalogue.



Partially predefined content (only generic content which have to amended by real content from the enterprise)

- Applications (SW) – information about IS/ICT applications,
- Computer (HW) – information about the hardware.

Implementation of the model

Aim of the implementation of the Reference Models is that the most of the work is done by users of the model and not by the consultants. Users are only coached when selecting appropriate model components and updating the model content.

When implementing the model in the real environment, we are using the following procedure [4]:

- kick-out workshop – the purpose and principle of the Reference Models is described to users,
- model components selection – users by themselves select the model components they will be using in the IS/ICT management,
- model relationships selection – users by themselves select the relationships among model components they will be using in the IS/ICT management,
- model database and front-end customization – model database application is customized based on the





user requirements (list of components and relationships),

- model front-end training – users are trained, how to work with the model database application,
- component and relations editing (coached) – users are editing updating and amending the model content,
- integrity reports generation – number of integrity reports is generated. It allows to identify the editing mistakes and problematic spots in the management system,
- model application – model is applied for the planned purpose.

Open Issues

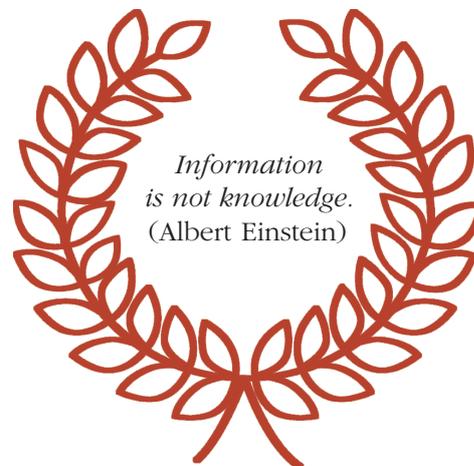
During the model implementation in the real environment we have found following open issues which should be solved in the future versions of the KIT Model:

- In order to elaborate the model as easy to use tool, we have selected MS Access database application – it is easily customizable and could be applied very fast without huge startup costs. On the other way it is not suitable for the multiuser work and it is quite difficult to coordinate model repositories between the customized models,

- IS/ICT managers are different – therefore each implementation is different. Each manager needs different information for the successful management of the enterprise, so each customization addresses different areas of the model. During the implementation we still have to rely on the experienced consultants which will help the managers with the component selection. We are planning to replace the consultant role (at least partially) by the content and structure profiling and including the expert system tool for selection of appropriate content and relationships.

Conclusions

Reference Models form new addition into the Information Management toolset. When implementing structured IS/ICT management system in the enterprise, it is worth to exploit the „best practices” included in the KIT Reference Model. Open issues connected with the future versions of the model are the transfer into specialized (preferably open-source) application supporting the multiuser access and having the expert system capabilities in order to improve the efficiency of the model implementation.



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Informational Signals

Giovanni Peterlongo (1), Sorin Ionescu (2), Larisa Gavrila (3)

(1) IFAP Roma, (2) University „Politehnica” of Buharest, (3) Ericsson Telecommunications

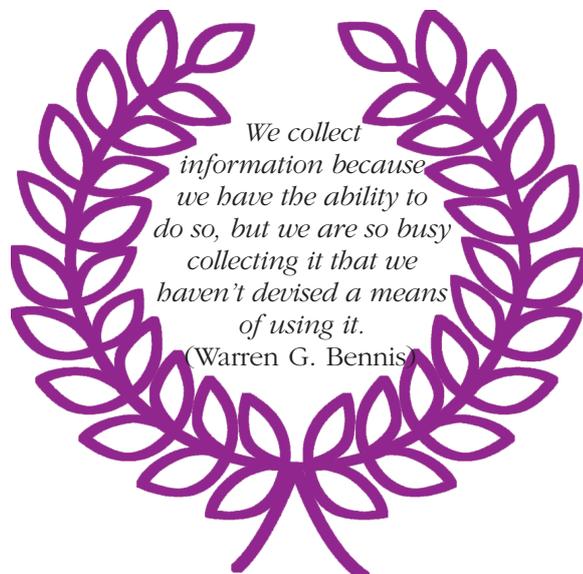
Abstract

We live in a society where information resources play a major role. Companies are interested in data, information, and knowledge. Special attention has been given to weak signals. The article covers how to identify these signals, how to record them and how to process them within the company, as well as the main benefit of their early identification. The article also shows that in order to receive the signals transmitted in the environment, the information system should be developed taking into account this new objective, otherwise the signals will not have any effect in generating the necessary emerging management strategy.

Keywords: signal, system information management, benchmarking, statistics techniques

INTRODUCTION

The organization's performance is directly conditioned by the data, the information and the knowledge used, meaning by the information resources. The data is the primary fact, the information represents the data significance and knowledge is the information obtained through training or experience. But in the category of informational resources also fall opinions (subjective character), rumors and signals. The rumor is unofficial information, which has the appearance that it is true. The signal is a short message that shows to competitors or customers the organization's intent. Through its properties is similar to the information signal.





The signal is special character information. In terms of the theory of meaning, the signal is a novelty that adds knowledge. Only man can interpret the meaning of a signal. Without this interpretation, signals just like information are only data (actions, processes described through numbers or letters). Norman Wiener believed that the information is a new state of substance, „it is neither substance nor energy, information is information.”

Unlike signals, knowledge is the information obtained through training or experience, action-oriented activities. Knowledge is different from information because it „concentrates on capital and labor” (P. Drucker). Knowledge is an inventory of information and skills generated through training and experience.

As it is well known, information resources give power to whom poses them (as Francis Bacon used to mention). In previous decades, a fundamental resource for business was the capital. In modern times the information became, according to Daniel Bell, a strategic resource; even more important is the signal showing the immediate intentions. David North [1] noticed that within a manager’s activity there is much uncertainty and for that reason,

it should be invested in the information search, including signals. The importance of information has made the current society to change, now being mentioned of the information society and the knowledge society.

The information society is made up of many organizations that use information and communication technologies as well as computers, telephones, television, email, ATM, online newspapers, electronic signature, electronic money (cards), programs of protection against unwanted messages, internet, cable television networks) [2]. This led to the „new economy” or the „digital economy” but it also led to a negative phenomenon like «DD» (digital divide) that excludes the benefits of new technologies, social categories or regions [3]. Within the informational society, the raw material but also the result of the transformation process is information. These changes have led to the emergence of global information networks, international corporations; economic decisions are taken on a worldwide scale due to globalization.

The knowledge society is made up of all knowledge-based organizations, specialized in a field. This specialization requires cooperation and the emergence of the organizations’ networks. In this case the advantage of a nation is no longer within natural resources or cheap labor, but also within the ability to fully harness the intellectual capital. Efficiency is given by the knowledge used in operations. Because people are those who produce knowledge, firms are careful with them and seek to achieve the employees’ satisfaction.

SEARCHING FOR SIGNALS

Systematic collection of operational information made his debut [4] in the 14th

century, in the Fugger Company, in Augsburg, a company involved in the mining industry. For identification of signals and information gathering, experienced people need to be involved otherwise the significance of the signal cannot be identified.

Difficulties in searching for signals appear due to excess of information and knowledge, because in times of crisis the excess of information is equally dangerous as the lack of information. Although the signal is a message sent by the company, collateral data that can separate the signal from the rumors are required. Their identification depends on the type of information needed, because the information can be public or protected.

The main methods for collecting the information are industrial espionage that penetrates the information systems of competitors and ensures strategic economic research. The signals are transmitted intentionally but from the crowd of information are sometimes hard to be detected.

Information and knowledge can be protected in different ways because they are strategic resources used to achieve competitiveness. Protection is required [5] because in addition to espionage, other incidents may occur such as fraud, theft, destruction, disclosure, loss, misuse, alteration, non-availability. Their security shall ensure confidentiality, integrity, availability.

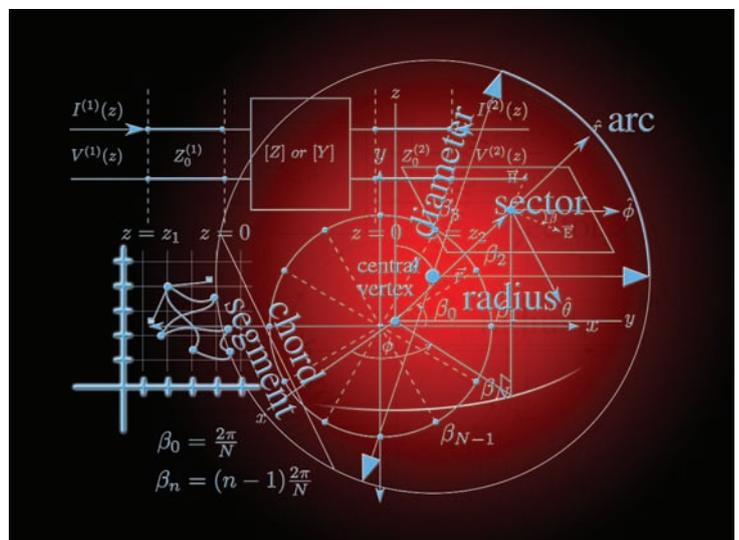
Data protection methods have evolved over time. For example it was resorted to hiding information, guarding the information, encoding information, global security (protection of sources, of information, of persons who process them), flexible protection (the classification of the information, authorized access steps, point protection) [6]. Total protection is allocated on all phases and selective protection

for essential information. It was found, however, that no matter how the company protects its information; the information is multiplied with an annual rate of 10.

Misinformation can also be used as a form of protection, which resembles confusion to make the information unusable. It is accomplished by distortion (erroneous messages are inserted), filtering (altering the message deliberately), jumper (some people are removed from the process/cycle), excess of information (unnecessary data is being transmitted); intoxication (transmitted repeatedly wrong signals).

Economic research uses data published by competitors. The investigation methods consist in research of statistical sources, direct research (from consumers, users, and intermediaries), and performing experiments (in marketing) including by simulating the phenomena using patterns. Public information can be found in the annual reports, articles and books written by specialists.

Strategic guard targets weak signals that occur in the environment and enables a range of reaction [7]. Strategic guard incorporates technological guard, commercial guard, competitive guard etc.



The technological guard is an activity of searching for information about what other companies are doing or detection of scientific news, innovation, best technologies used (B.A.T. best available technology) and optimal techniques (best available techniques T.O.D.).

It has been assessed [8] that there is an incredible amount of information which an enterprise makes public. What is important is that they are processed intelligently. For this reasons, intelligent management, clever marketing, smart corporation are being elaborated today. Managers must build complex teams made of analysts, procurement, production, finance, strategy, human resources specialists and external consultants, in order to determine the types of information needed by the enterprise. Working within a team ensures faster identification of the data meanings. The information sought refers to products; substitutable products available; competitors' relations with their suppliers; the technologies used; used distributors; cost structure;

key persons of the enterprise; relationships with buyers; investments made; profit's role.

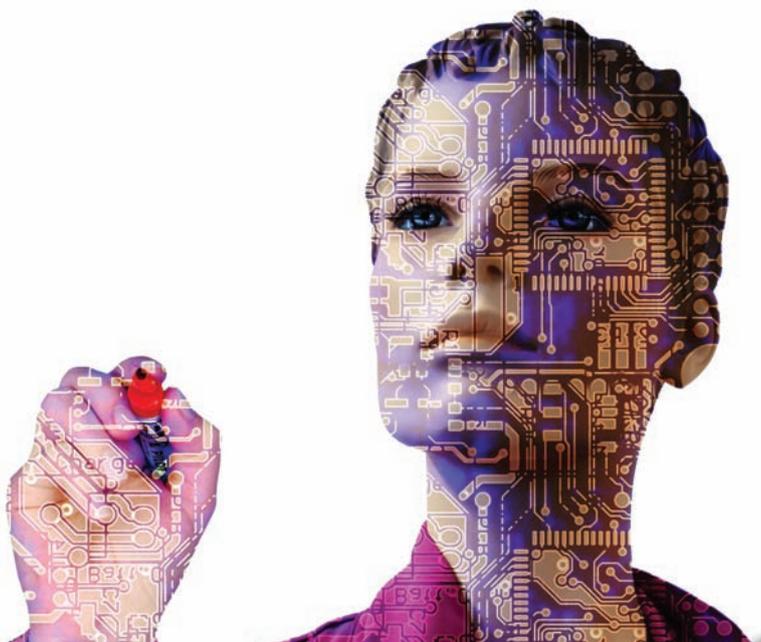
The information collection shall be carried out on the basis of a plan. It should define:

1. The sources used. They are chosen according to their purpose: product development, customer satisfaction, defeating competitors, etc.
2. Types of information: about the products of competitors, about the problems of clients, about dealing with banks, about the competitors' intentions.
3. Collection method: inquiries, visits, interviews, observations, experiences, etc.

Information processing. Special emphasis should be put on the use of statistical techniques in processing the information. Such methods could be:

- Data mining which extracts for management useful information from existing data;
- Text mining which consists in data extrapolation from text and identifies how words are being associated;
- Reality mining which analyzes data related to human behavior, in order to identify patterns of behavior. For this type of method, normally large databases (big data) are being used [9].

Mathematical statistics usage is based on the fact that within the mathematical theory, the information is a measure that quantifies the uncertainty reduction which occurs through signals' reception. Communicating a signal does not provide an information if the content is known, it offers a reduced information if it confirms a known state and a large amount of information if it includes unlikely elements. The information varies inversely with



mathematics probability. The measurement of the quantity of information in a message can be achieved through the calculation of certain indicators such as:

- Information entropy, which indicates the total information required to bring a system to a perfect order;
- Information energy, indicating average information in a system. Information increases with the energy system and decreases with disorganization (harmonization) of the system;
- Redundant information indicating the information overload.

Ed Deming mentioned that the main problem of managers is extracting the maximum information from data variation.

Signal evaluation. The signal just like the information is a special product. One who offers or sells information remains in her possession. Signal evaluation is done using the following criteria:

- *Signal quality* – is expressed through its characteristics, for example the veracity (to be true), precision (to have a high probability of being true), accuracy (to be exact), relevance (to present significance for particular situations), opportunity (to exist at the time required), frequency (probability of occurrence).

The signals, if they are transmitted, occur before the event. For the remaining information it was found that 50% of the information required by management arrives too late and that 30% of the information used becomes obsolete. Signals and information must be used quickly because they lose their significance and because they are already aged when they are picked.

- *Signal's cost* – it would seem that the signals do not cost, but sometimes



their identification is not done easily. However signal collection and signal processing cost (J.F. Kennedy noticed that information is expensive but nothing is more expensive than the lack of it).

- *Signal's usefulness* – is assessed based on decision anticipated significance. Regarding this aspect, Ishikawa wrote: „we need to rely on data, but when you have data beware”. So are false signals, flawed, subjective, useless posts and immeasurable things. If they are not used correctly even precise signals are without significance. C. Clausewitz demonstrated that much of the information obtained is contradictory; a greater part is false and mostly is doubtful.

STRATEGIC WATCH

The strategic watch is a method used for identifying new ideas based on market signals. Signals could come from competitors or customers. What a competitor does is easy to see, what a competitor thinks is less easy to spot. Not only is the demand identification important for customers but also the needs identification [10]. One must



listen to customers and competitors, even indirect ones, must be looked after [11].

For market surveillance, a system of investigation covering the field of weak signals needs to be developed, a system able to provide relevant and accurate information. Companies have for this purpose a marketing information system

Signal and information gathering is done by market research (Marketing Intelligence). The messages come from salesmen, service companies, distributors, buyers, trade publications, trade associations, government publications, consultants. From this information must result data allowing [12] continuous surveillance of consumers and producers; gathering opinions about products sold; price fixing; control of all activities. Signal collection is made through the investigation of statistical sources; direct research at household and industrial users; experiments in marketing; simulating phenomena through models.

Many ideas arise from client research. Clients have needs, necessities, desires and requests [13] that led to segmented market. The necessities are seen as shortcomings

that customers have, shortcomings that cause them discomfort, without having them realizing this. The need is a known shortcoming. Desires are ways in which needs can be met. A demand can be seen as the client's option for a certain way of fulfilling certain gaps. Techniques used in the investigation are: interview, press conferences, surveys, motivational observation, conjectural test, monograph, simulation. Taking this in consideration Kenichi Ohmae [14] said that „it is important to take into account the competitors, but first you have to pay attention to the needs of the buyer”.

A similar segmentation can be applied for competitors by building a product-market matrix and their targets can be identified. The competitors have a certain way of thinking, a certain system used for services or product delivery, a system that can provide a competitive advantage.

Best practices research in the market is made using benchmarking studies. To improve processes, managers are increasingly aware of how the successful competitors on the market solve their problems. Not only the direct competitors are sources of ideas, but also the indirect ones encountered on certain markets. Competitors and buyers offer certain „benchmarks”. American Center for Productivity and Quality defines benchmarking as „a process of continuous systematic measurement and comparison of the processes used in an organization with the processes used by a market leader, regardless geographical position, in order to obtain information that can enable the organization to act in order to improve its performance” [15]. The European Commission believes that benchmarking is a tool that helps businesses, local authorities and industry to improve performance [16].

Competitors' actions are as complicated as own activity, but the information is much more difficult to obtain. Theoretically, each competitor's activity can be analyzed: marketing, manufacturing, sales, etc., but whereas the sources of information are protected, it is recommended to pay attention to certain areas only, the information obtained should be then processed. Main info sought are: common products, substitutable products, relationships with competitors, suppliers, distributors, technology usage, cost structure, relationships with buyers, the investments made in recent times, profit's role.

The sources that can be used for information collection are: publications (annual reports, studies of competitors, press reports, investment analysis reports, press conferences); sellers and distributors reports; technological information; studies of competitors (competitors, suppliers, buyers); the information collected by consultants; work contracts. For obtaining information benchmarking associations are being constituted. Conditions for benchmarking:

- Reciprocity in the exchange of information – major companies receive an enormous number of requests for information. The information supplier must receive the results of the studies performed in order to have a benefit from sharing the information.
- Processes-analogy – processes must be comparable, to use the same units of measurement, the same time frame.
- Fairness – to ensure that the information provided is accurate.

Benchmarking techniques [17]:

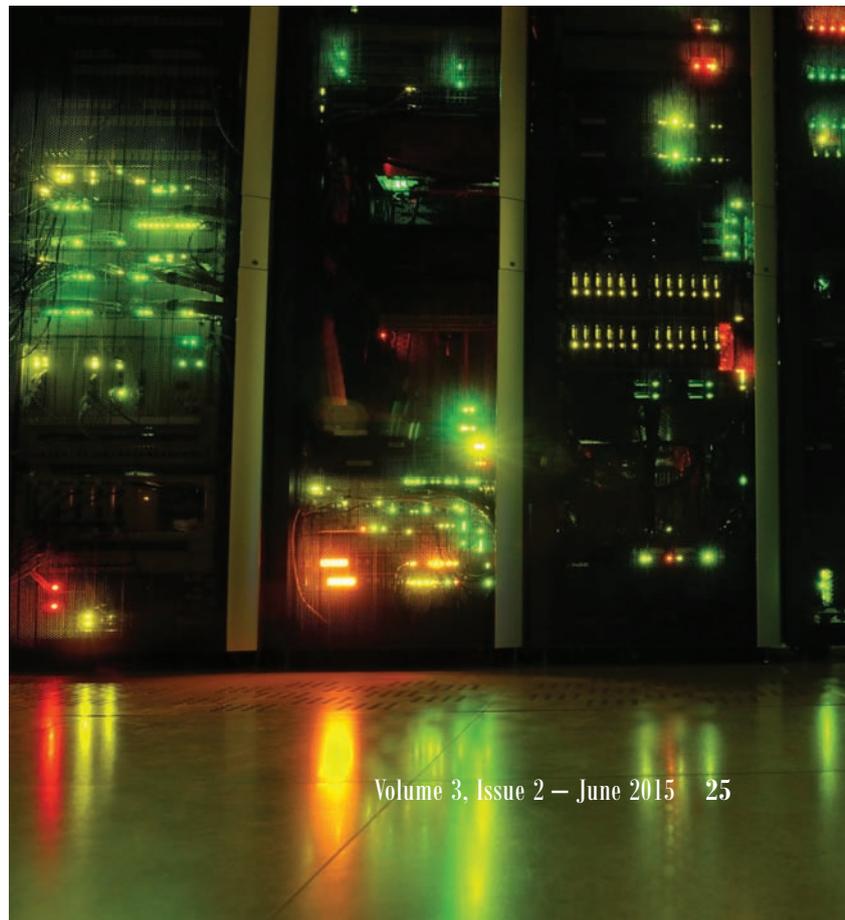
- BDP – Best Demonstrated Practice – compares a company's departments;

- RCP – Relative Cost Position – examines each item in the cost structure.
- BRP – Best Related Practice – make a comparison between different companies on the same departments. Costs, products, quality, location, subcontracting production plants, reengineering are being compared elements.

Searching for benchmarking partners constitutes a major problem. Big companies are interested in the information provided by very good companies. Companies that have similar processes or something to learn from a benchmark study must be selected.

The benchmarking process has the following steps:

- I. **Planning:** identifying the key points; identification of competitors; determining the method of data collection.
- II. **Analysis:** determination of existing gaps; projecting future performance levels.



III. Integration: communication of findings; functional goal setting.

IV. Change management: the development of action plans the implementation of specific actions and progress driving; measurement of new gaps.

Signal recording is done in the company's information system that is represented by the combination of information and knowledge used, information flows, procedures and people who process them. All these elements form the Management Information System. It is important that the information is collected and processed quickly. The information system has procedures for collecting the information (for input), machining the information (for processing information and generating new meanings) and information transmission. The procedure is defined as the combination of rules set for establishing the methods used for collecting, recording, transmitting and processing the information. Procedures are needed for recording, storage, processing, analysis and presentation of information needed.

For the interpretation of the signals it is necessary a good knowledge („representation without concept is empty” said

Immanuel Kant). In addition to this, the information circuits need to be reviewed to gain access to recorded signals. Chester Barnard (in his book *The Functions of Executive*) mentioned that organizations' unity is due to the existent information, as managers need to be preoccupied by the information's movement.

Designing the information system for this purpose triggers its simplification. For this purpose it shall be considered whether it is congruent with the management system (the information system is a subsystem of management system), if it is congruent with the decision-making system (it delivers the information to the decision); the procedures for collecting, processing and transmitting information are compatible with each other; if it is selective (only essential information is received); if time permits necessary corrections; if information identification is provided from primary operational data; if it is flexible (you can change all its characteristics); if it is efficient (cost of the use of the information system must be compared with the effects obtained).

Recording signals (**S**) involves attaching multiple codes (**C**) and then analysis of the signals based on these codes (Fig. 1).

S1	C1	C7	C11	C17
S2	C2	C7	C8	C12
S3	C3	C7	C9	C10

Figure 1 – *Signal recording*

For analysis are considered signals attached for certain code (Fig. 2). Among them are established significations. This analysis involves intelligence, defined by Jean Piaget as the ability to make links between facts. Perhaps in time, artificial in-

telligence will be used increasingly more for this purpose. G. Washington mentioned that seemingly inconsequential things when associated with others can lead to valuable conclusions.

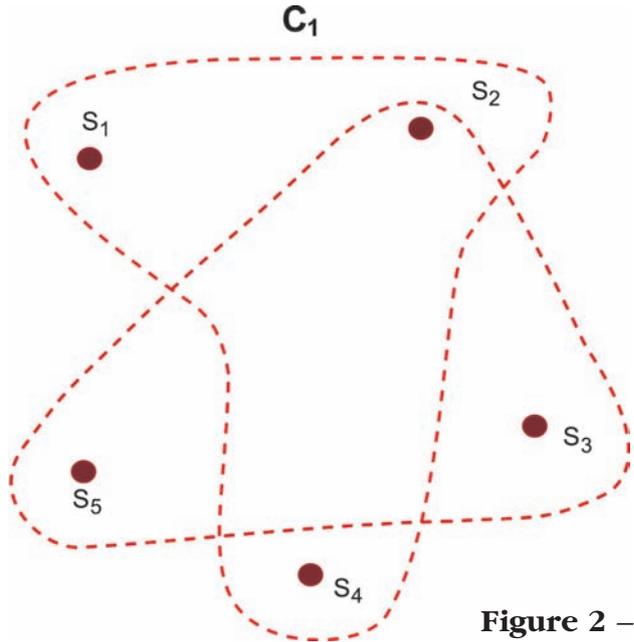


Figure 2 – Signal analysis

Signal and knowledge representation can be done with generic, associative and partitive relationships (Fig. 3) (according to ISO 9000). In the generic relations subordinated concepts have all the proper-

ties of the concept of origin. Associative relationship describes a relationship between two concepts. In the partitive relationship subordinated concepts are parts of the concept of origin.

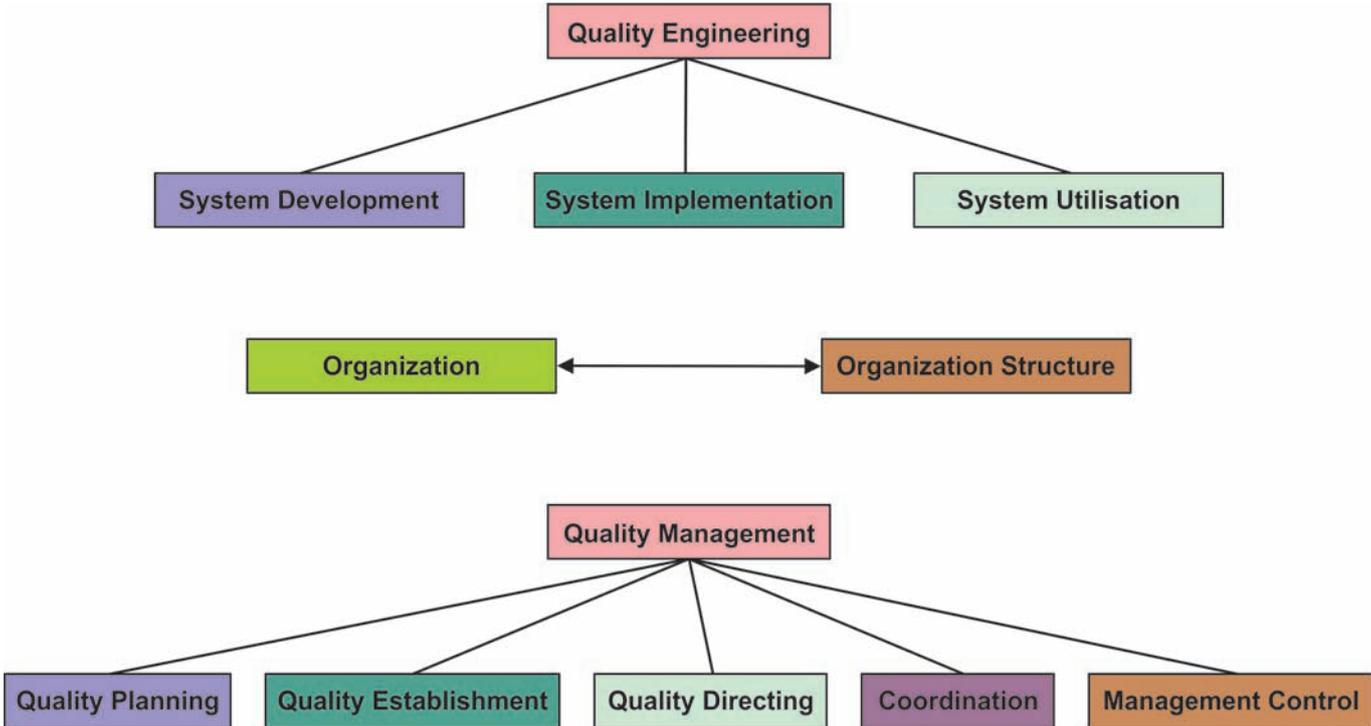


Figure 3 – Knowledge representation



SIGNAL CAPITALIZATION

The signal is information that complements the knowledge. Information management and knowledge management have emerged into a knowledge industry [18] which includes both individuals and firms. For example, the economy of the European Union wishes to rely on knowledge and the „Oslo Manual” of the EU, regarding innovation, classifies activities within an economy as being knowledge generators (scientific); product generators (productive); service generators (marketing).

The signals can be stored in databases, but they are also known for some people. People with special knowledge in a certain domain are really needed and wanted and for this reason they often move from a company to another. Experts are trying to keep their high ranking by seeking firms that need them the most and often they work for several companies.

Within knowledge industry we can find companies for which the possessed knowledge and not obtaining lower costs consists in a competitive advantage. In fact,

it is observed that today' wealth is created in the knowledge industry.

In parallel with the knowledge industry, a network of knowledge is formed. Through this network companies can gain knowledge. Some experts consider that the network resembles „a net worked poorly with different mesh sizes”. The network can be represented by a graph which has within its nodes firms, universities, individuals, government agencies and military institutions, etc. Knowledge networks are being designed (an organization is a network of knowledge) or natural (based on alliances between organizations). In order to build a network must supplier and users must be identified; the links between the nodes need to be established, the degree of centrality needs to be set (the number of arcs that enters a node); degree of importance needs to be defined (number of links with major firms); set the closeness level (companies seeking a better position in the network).

The knowledge of a firm is heterogeneous, as there are differences between firms in terms of knowledge [2]. Their distribution is normal. Few people have poor knowledge, most have average knowledge and few have high knowledge. Within firms in developing countries, the number of people who have average knowledge is lower compared those who belong to companies in developed countries.

The signals' effect is to elaborate emerging strategies that joins the deliberate strategies for the management of the companies. Because knowledge can be seen as a product, knowledge trade has appeared. To be able to be used, the knowledge needs to be coded and entered into the knowledge base. Economic growth in recent years is due codification of knowledge.

Stakeholders possess and can generate knowledge. Friedrich Hayek speaks of the division of knowledge among commercial agencies. Corporate governance must take into account the knowledge potential of shareholders and managers. However the information asymmetry is observed, some people being better informed [19].

In modern economy, signal and information processing acquires even the character of a production factor in its full rights. If the signals are provided, their verification will require additional information. In addition to the products, companies also sell information. Trading information appears like an industry. In the USA, 20% of GNP is devoted to information collection, processing operations and information dissemination. Firms that sell financial information increase their revenues 11 times in five years. Data that is the property of a company is offered on a contract basis.

Process information is also important. The revenues obtained by selling process information can grow by approximately 50% in a decade. In a first instance, process information was used to ensure normal functionality of equipment. It consisted in working instructions, regulations, staff experience manufacturing, inspection methodology. After the Second World War, the information began to be processed by the staff of the enterprise in order to be able to adapt to the process the raw materials, to improve the product according to the requirements, to reduce costs. Now it is found in processed form. In some countries, 30% of the value of a production is obtained through the process information. The process information is quantified as know-how, technical assistance and software.

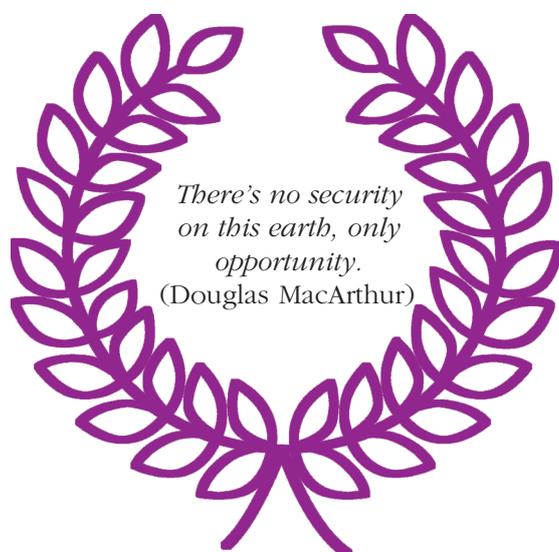
Conclusions

Companies need to pay attention to the signals emitted by different agents acting in the economic environment. In general, companies have today solutions for building systems information management and systems knowledge management. But the importance of these signals requires system development for information registration and information processing. This involves the construction of specific methods of identification, collection, storage and processing of signals. The advantages are indisputable, the reaction time to market changes increases when the signal is identified more quickly. The World Bank considers that the wealth of a nation consists also in its ability to process the information.



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Strategic Business Areas

Mariana Balica

Mariro Activ Consulting Bucharest

Abstract

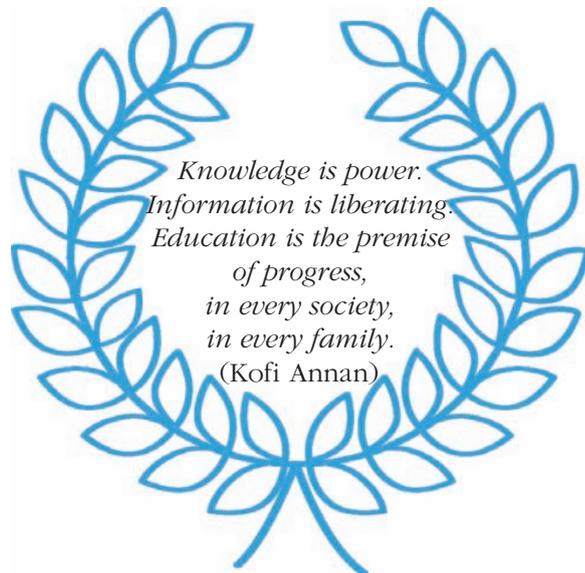
The managers from companies need the analysis of the economic activities' evolution because, on the basis of those assessments, they can establish the policies and strategies on short- and middle-term, both at the level of management and execution. In the global economy the service sector is growing and this situation is reflected in the increase in the number of employees in the domain, on the one hand, and, on the other, in the growth of the percents of incomes from that sector at the level of gross domestic income for the country.

This study aimed to stress the peculiarities of the development/ evolution for the Romanian economy in the period 2010-2014. The data for the analysis came from the annual reports of the Office of the Trade Register, the reports of the research institutes, and the existing legislation in the domain. The analysis showed that the Romanian economy follows the tendencies recorded at the world-wide level as regards the development of services sector.

Key words: service sector, authorized person (PFA), limited responsibility societies (SRL).

INTRODUCTION

The managements of companies faced major difficulties in planning, organizing, coordinating, guiding, controlling and solving the problems which appeared during the production activities. This is especially the case of the services which have as the main characteristic the intangibility. To support the managers of companies various studies were developed by the experts, among them the conjecture inquiry,



qualitative inquiry and other methods of analysis proving their usefulness.

The article presents the results of the secondary analysis of data regarding the services sector as they were included in the conjecture inquiries made by the National Institute of Statistics between 2010 and 2014 and the Statistical reports of the Trade Register for the same time period. The following activities included in the services sector were the following: trade, restaurants and hotels, transport, finance, insurances, storages, communication, business services, social services, personnel etc.

At the world-wide level one can notice the increase of the service sector, and this evidence was supported by the growth of the incomes of that sector at the level of gross domestic income and the increase of the total number of employees in the field. According to the World Bank statistics, in 2012 the countries which had the highest proportion of their gross domestic income coming from services sector were USA, Japan and Brazil. The same three countries are among the first ten countries in the world which has the greater workforce employed in this economic sector (Table 1).

Table 1 – *The distribution of labor and services sector share in GDP at international level*

Country	Number of persons employed 2012	Value added to GDP by services sector 2012 (%)	Number of persons employed 2013	Value added to GDP by services sector 2013 (%)
China	787 632 272	44,6	793 307 655	46,1
India	472 125 599	56,3	481 235 954	57,0
SUA	158 666 072	77,7	158 959 242	–
Indonezia	118 378 606	38,7	120 289 413	39,9
Brazilia	104 745 358	68,7	106 169 639	69,3
Bangladesh	76 038 745	56,2	77 609 689	56,1
Rusia	76 872 229	59,2	76 977 332	59,8
Japonia	65 281 090	73,2	65 545 688	–
Pakistan	63 777 830	53,4	65 569 740	53,8

Source: The World Bank [4]

In 2012 in Romania a number of 9,602,079 persons were employed, and the sector of services constituted 51,6% of the total gross domestic income (World Bank, 2015). One year later, in 2013, the number of employed persons decreased (at 9,578, 659) and correspondingly, the services sector represented 50,4% of the total gross domestic income.

In 2013, using the data available in the annual balance of companies centralized

online by the Ministry of Finances, Edendred made an analysis at the level of Romania and the results indicated the hierarchy of the first ten companies in Romania as regards the number of their employees. The results showed that the majority of this companies were from the services sector (commercial services and banks services: OMV Petrom SA (19,016 employees), Automobile Dacia (14,002 employees), Kaufland (12,589 employees), RCS\

SUCCESS

RDS (9,374 employees), Delphi Packard România (8,518 employees), BRD (7,347 employees), Sews România (7,254 employees), ArcelorMittal Galați (7,115 employees), Carrefour România (6,703 employees) and Dedeman (6,489 employees).

The evolution of the Romanian companies

The activity of the Romanian entrepreneurs is regulated through the legislation that allows them to act as societies/companies/enterprises of the following types: authorized person (PFA), individual enterprise (II), or family enterprise (IF). Those are regulated through the Law no. 300/2004 (modified and updated). This shape of authorizing an activity appeared from the intent to allow the development of the Romanian business environment. It offers the possibility to use the experts and specialists from the domains which are not regulated through special laws. The main characteristic of it is the use of own workforce and/or the work-force of the family

and of the individual professional abilities. The legislation from this domain was changed in time until 2014 in order to make more accessible the use of experts and specialists in the Romanian business environment.

From the analysis of the statistical reports made by the Romanian National Office of the Trade Register for 2010-2014 (Table 2) one can notice that the number of companies acting in the field of retailing had been higher (30%) and that there was recorded a tendency to increase it during the entire period. The companies acting in the scientific field (which also enclosed the activities regarding the consultancy in the management of the companies) represented 10% from the total of companies established that period of time. Also, an important decrease appeared in the case of agricultural, forestry and fishing CAEN, from around 20% in 2010-2013 to a smaller percent in 2014.

As can be seen in Table 2 in the last four years the activities from services had increased twice as number, from 35% in 2010

to around 61,40% in 2014. This growth manifested in the increase of the workforce employed in the sector and the development of the contribution to the gross national income. The industry sector had remained constant during that period of

time and construction increased with around 1%. Important changes were recorded in agriculture where the number of companies established decreased from 17,62% in 2010 to around 4,03% four years later (in 2014).

Table 2 – *Evolution of the number of companies established during 2010-2014, by sector of activity*

CAEN name – main activity	2010	2011	2012	2013	2014
Industry	6621	7975	7734	6617	5706
Construction	7830	11698	9086	8425	7584
Other services	4445	4588	4585	4672	4559
Wholesale and retail trade repair of motor vehicles and motorcycles	37093	36136	36658	35785	36840
Professional, scientific and technical activities	11244	12198	11076	11792	10351
Administrative and support services	6033	6884	6499	6470	5952
Hotels and restaurants	5413	6027	5520	5938	4697
Total service activities	64228	65833	64338	64657	62399
Agriculture, forestry and fishing	20971	20382	20729	21697	4097
Other CAEN-s	19398	24274	23716	23420	21841
Total registrations	119048	130162	125603	124816	101627

Source: National Office of the Trade Register [3]

At the same time one can stress that an increase of 9,34% of the number of companies established in 2011 versus the number of companies established one year later. In 2012 this number decreased with 3,50%, in 2013 this decrease was very small, of 0,63%, while in 2014 the decrease was an important one – of 19,09% (Fig. 1).

When the number of registrations of companies for the last five years according to their judiciary status is analyzed (association, authorized person and judiciary person) and taking into account the eight regions of Romania, some interesting characteristics of the distribution of companies at regional level appeared. The statistical data from the Romanian National Office of the Trade Register regarding the number of

registrations of enterprises at the level of Romanian districts were grouped as follows:

- Region 1 North-East (Bacău, Botoșani, Iași, Neamț, Suceava, Vaslui);
- Region 2 East-Dobrogea (Brăila, Buzău, Constanța, Galați, Vrancea, Tulcea);
- Region 3 South-Muntenia (Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova, Teleorman);
- Region 4 South-West-Oltenia (Dolj, Gorj, Mehedinți, Olt, Vâlcea);
- Region 5 West (Arad, Caraș Severin, Hunedoara, Timiș);
- Region 6 North-West (Bihor, Bistrița, Cluj, Maramureș, Satu Mare, Sălaj);
- Region 7 Center (Alba, Brașov, Covasna, Harghita, Mureș, Sibiu);
- Region 8 Bucharest-Ilfov.

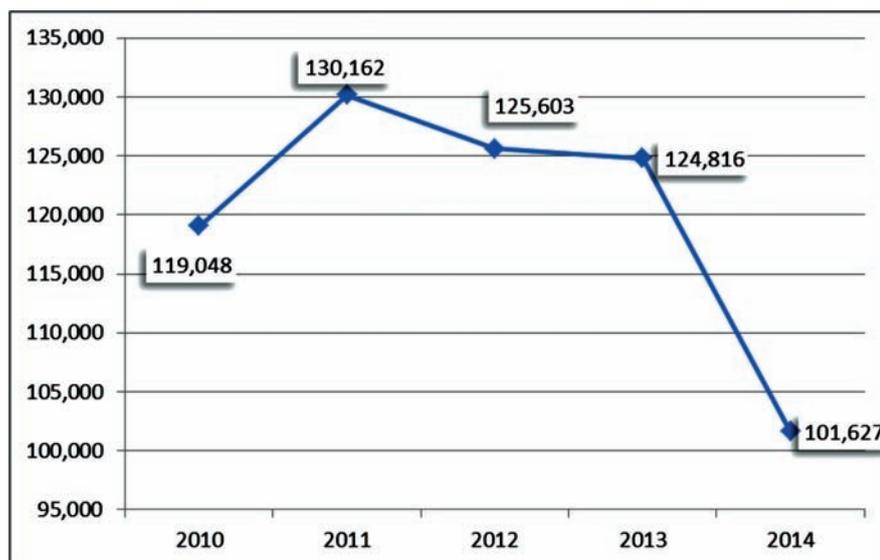


Figure 1 – Evolution of company registrations in Romania

Source: National Office of the Trade Register [3]

Those results showed that in 2010 from a total of 119,048 registrations the greatest number of judiciary persons were established in region Bucharest-Ilfov (17,73%), followed by region North-West (15,43%) and region North-East (13,05%). As regards the type of organization the greatest number was represented by SRL's (40,40%),

followed by PFA's (36,42%) and the number of SA's, RA's or other types was small.

A great part of this increase was due to the externalization of services regarding human resources, accounting, management consultancy, cars reparations activities (Fig. 2).

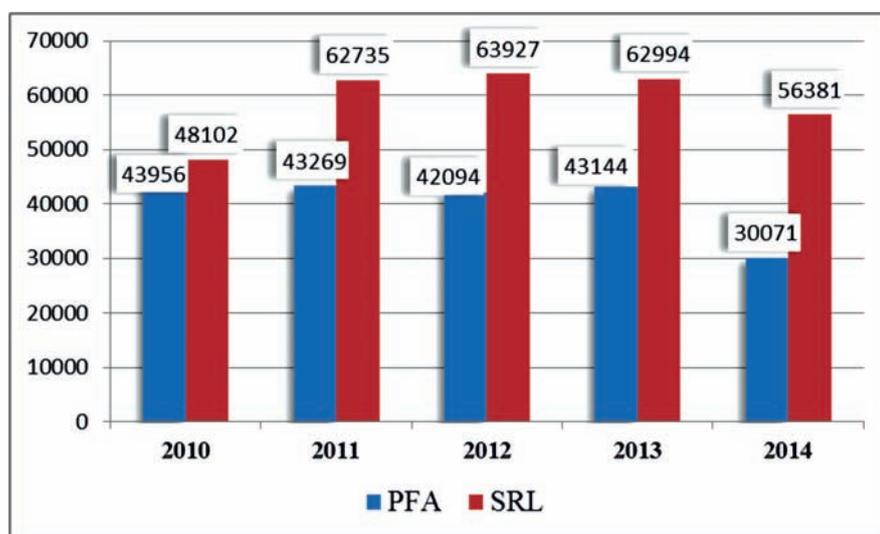


Figure 2 – Evolution of PFA and SRL

Source: National Office of the Trade Register [3]

As regards the distribution of companies/enterprises according their domain of activity the greater number of companies

were in the commercial sector, followed by agriculture, other activities in services and buildings (Fig. 3).

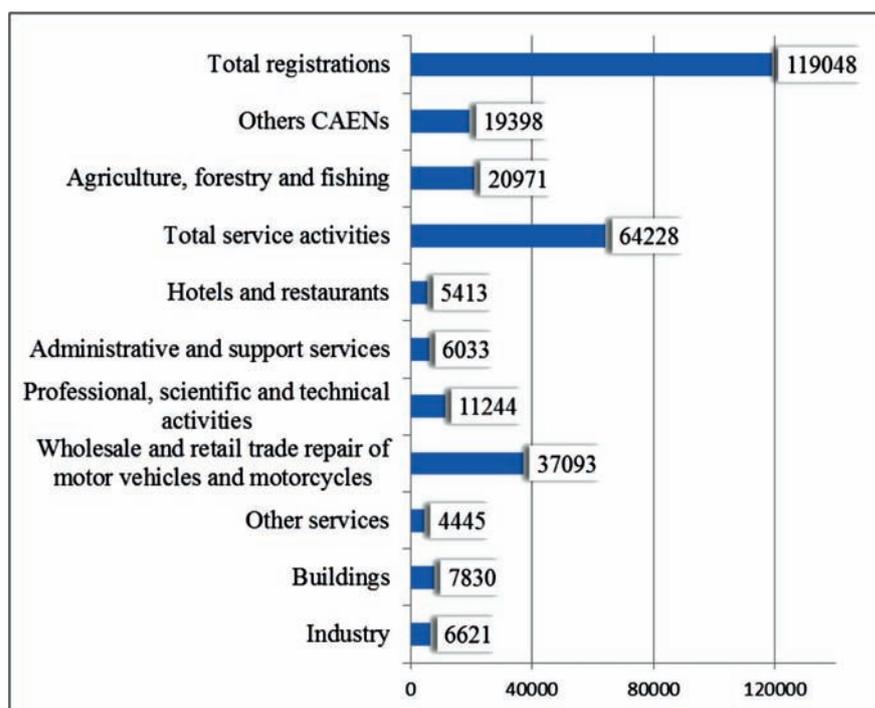


Figure 3 – *Company Registrations in 2010*

Source: *National Office of the Trade Register [3]*

In 2011, out of 130,162 registrations (Fig. 2) most companies were established in the Bucharest-Ilfov (17,48%), North-West (15,29%) and the North-East region (13,06%). In terms of organizational form, most were SRL (48,20%) and PFA (33,2%) (Fig. 4). Most companies were operating in the field of commercial services and other service activities, construction and manufacturing. It can be noticed a continuous interest in the establishment of companies with activities in the field of commercial services and an increase (compared with 2010) of the number of companies with activities in the other types of services.

In 2012, out of 125,603 registrations (see Fig. 2) most companies were established

in the Bucharest-Ilfov (18,12%), North-West (16,14%) and the Northeast region (12,38%) maintaining the same trend as in the first two years of the analyzed period. In regard to the organizational form, most were from SRL (50,90%) and PFA (33,51%). The main activity carried out remains the services sector (commercial and other services) exceeding 50% of the whole activities (Fig. 5).

In 2013 out of the total of 124,816 registrations (Fig. 2) most companies were established in the Bucharest-Ilfov region (18,56%), in the North-West (16,51%) and the North-East region (12,50%).

As in previous years, the wholesale and retail trade and the auto reparation sector

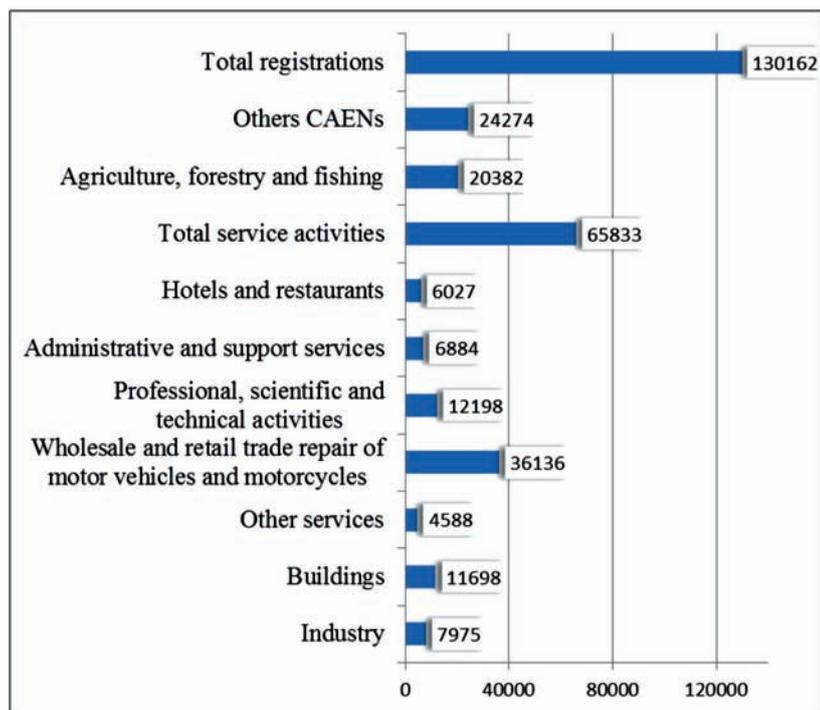


Figure 4 – Company Registrations in 2011

Source: National Office of Commerce Register [3]

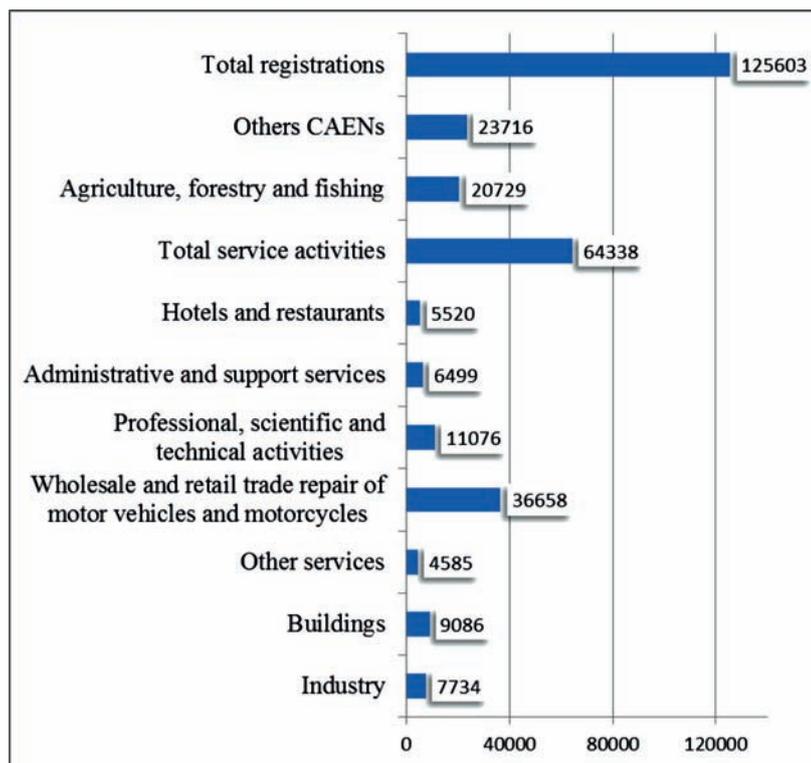


Figure 5 – Company Registrations in 2012

Source: Romanian National Office of the Trade Register [3]

are beyond the other objects of activity, both representing 28,67% of total registrations. Other significant sectors are

agriculture, forestry and fishing (17,38%), other professional, scientific and technical (9,44%) (Fig. 6).

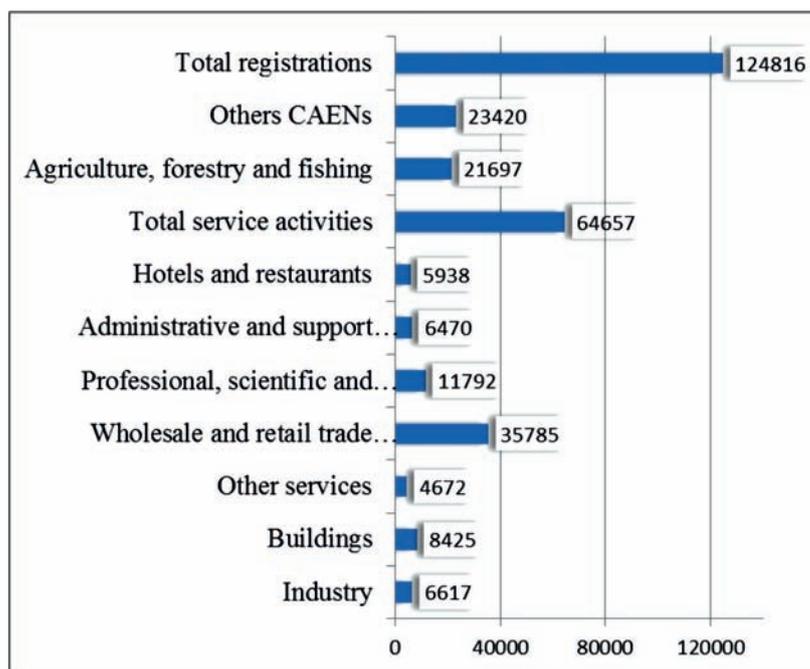


Figure 6 – Company Registrations in 2013

Source: Romanian National Office of the Trade Register [3]

In 2014, there is a significant decrease in the number of registrations compared to the previous year – with 18,58%. Out the 101,627 registrations, mostly they were

SRL's (55,48%) even though they fell by 6,49% compared to the previous year. They were followed by PFAs (30%), which a 31,36% decreased in comparison with the previous year. Physical Persons accounted for 44,30% of total registrations of the year (Fig. 2, Fig. 7).

Regarding the field of activities that have been chosen for the companies established in 2014, the same sectors remain on top trade and repair of motor vehicles (about 36% – an increase of 2,95% over the previous year), activities Professional, scientific and technical (10%, with a decrease of 12,22% over the previous year) and the rest with small differences but decreases to 2013 (Fig. 8).



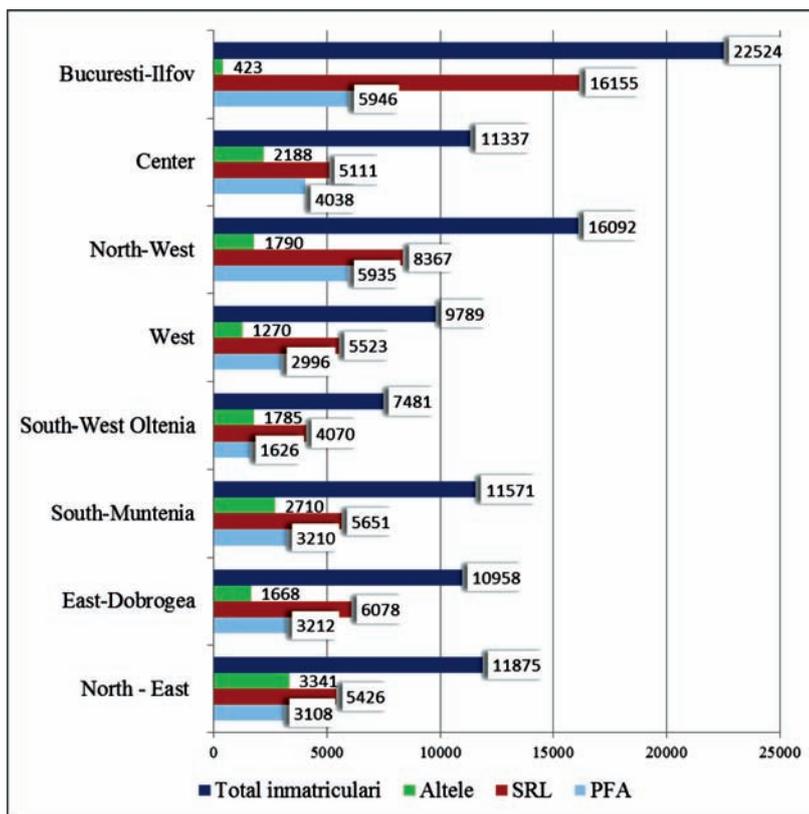


Figure 7 – Company Registrations in 2014

Source: Romanian National Office of the Trade Register [3]

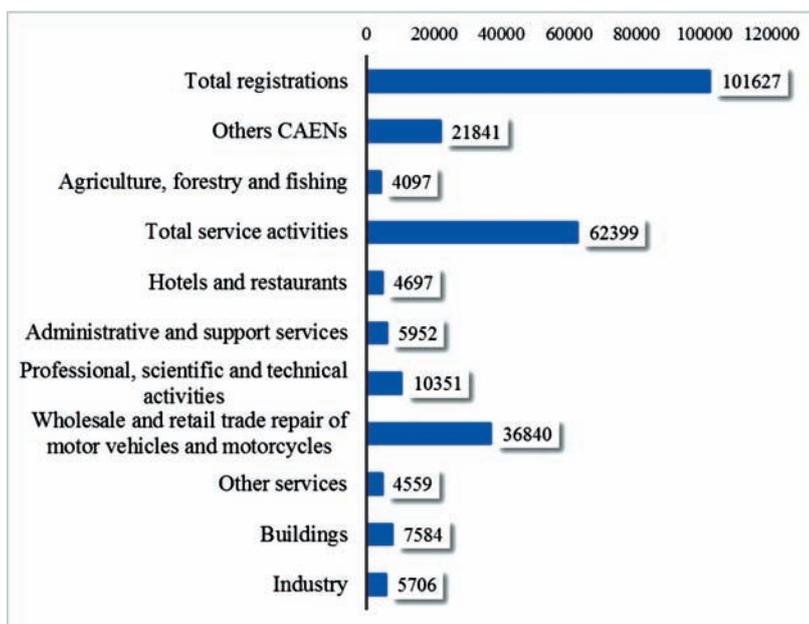
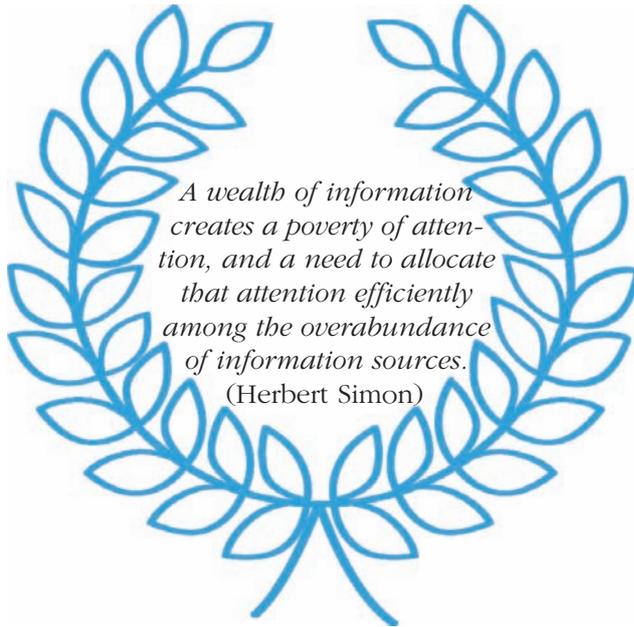


Figure 8 – Company Registrations in 2014

Source: Romanian National Office of the Trade Register [3]



Conclusions

Services sector becomes increasingly important in the world economy, having a central role in the economic growth. The World Bank has established that they participated since 2012, totally with about two-thirds of GDP (2012 – 70,2%, 2013 – 72,4%) and is expected to continue growing (2015).

Romanian economy aligned to the global economy, and this can be also seen in the large number of companies established in the period 2010-2014 which is oriented towards service activities – mainly commercial, business consultancy, insurance, hotels and restaurants.

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Technological Signals and Strategic Goals

Kasim Tatić

School of Economics and Business, Sarajevo

Abstract

The aim of this paper is to highlight and stress some relevant relations existing among three entities: scientific-technological progress, environment and economic growth. This paper represents an attempt to contribute to understanding of the specific role of science and technology in the process of economic growth primarily in the light of environmental constraints and issues.

We analyse the framework of a general process of setting and realization of societal developmental goals stressing the specific role of technology in that process.

We emphasise several important feedbacks explaining the real possibility to reconsider and significantly change once determined and accepted set of societal developmental goals. Our hypothesis, is that the very technology, by means of different feedbacks critically and decisively influences the very process of determining social values, selection of societal preferences and finally setting of developmental goals.

Keywords: technology, science, economic growth, sustainable development

INTRODUCTION

Scientific-technological progress has boosted economic development worldwide, but also has changed the attitude toward the nature, resulting in a deep, global social and environmental crisis, leading to an important question: Can we live and behave as we are the last generation on the Earth? Numerous advocates of sustainable development think we can not, should not and finally must not live that way.





What is sustainable development about? Sustainable development is about enhancing human well-being through time.

However, what constitutes a good life is highly subjective, and the relative importance accorded to different aspects of well-being varies for individuals, societies, and generations. But on some elements most people could probably agree:

- (a) Having the ability and opportunity to shape one's life – which increase with better health, education, and material comfort – is certainly one of them;
- (b) Having a sense of self-worth is another, enhanced by personal spiritual growth, family and social relationships, inclusiveness, and participation in society;
- (c) So is enjoying physical security and basic civil and political liberties;
- (d) And so is appreciating the natural environment – breathing fresh air, drinking clean water, living among an abundance of plant and animal varieties, and not irrevocably undermining the natural processes that produce and renew these features. Indeed, peoples' self-reported happiness and satisfaction with life are closely associated with all of these factors.

In 1991, the World Bank offered the following core principles of sustainable development:

- (a) the rate of renewable resources must not exceed their rate of regeneration;
- (b) the rate of use of non-renewable resources must not exceed the rate at which renewable substitutes are developed;
- (c) the rate of pollution emission should not exceed the assimilative capacity of the environment. So, we agree that sustainability is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs. Painful choices have to be made. Thus in the final analysis, sustainable development must rest on political will.

Common principles embedded in most definitions of sustainable development are as follows:

- (a) integration of environmental and economic goals in policies and activities;
- (b) enhancing quality of life or well-being, social equity and community participation;
- (c) equity between generations and within generations of humanity (intra- and inter-generational equity);
- (d) conservation of biodiversity and ecological integrity;
- (e) constant stock of natural capital (need to maintain „critical natural capital”) and sustainable flow of income;
- (f) recognition of the global dimension;
- (g) dealing cautiously with risk, uncertainty and irreversibility;
- (h) ensuring appropriate valuation of environmental assets.

For any given technology, preference structure, and known resource base there are some utilization rates that cannot be

sustained. Drawing attention to these unsustainable rates is critical to informing decision-makers and changing course toward sustainability. This will often require: altering the pattern of preferences; the resource intensity of technologies, or the relevant time horizon for different decisions. Recent definitions have practically focused more explicitly on the three (four) pillars of sustainability: economic, environmental, social and (cultural). The thinking about social and cultural sustainability is not yet as advanced as for the other two pillars. Societies do, and will continue to, transform over time. But it seems clear that significant social stress – and, at the extreme, social conflict – is likely to lead to a breakdown in the accumulation or preservation of all assets, thereby jeopardizing intergenerational well-being.

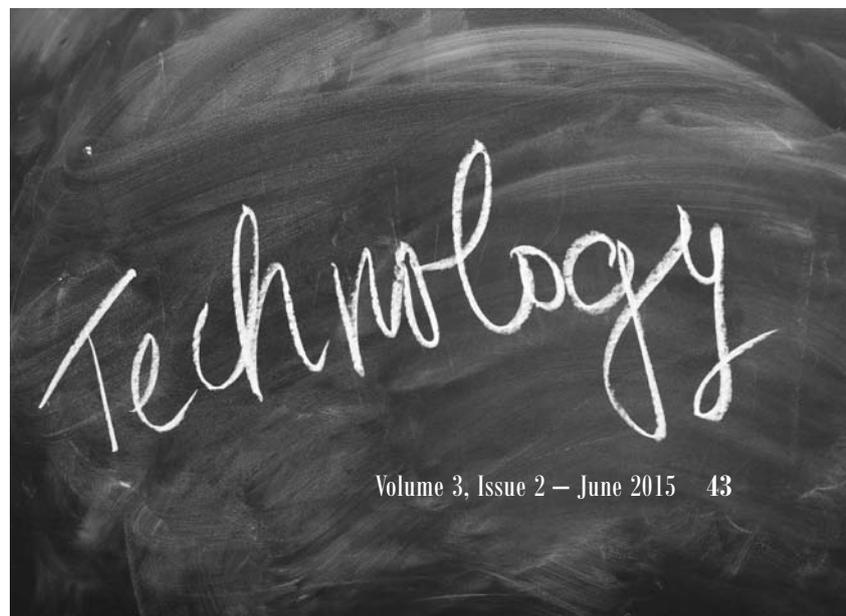
The role of technology

Technology might be defined as a visible externalization of the inner world of human beings. Starting point of the whole contemplation on the issue of the link between scientific and technological progress, economic growth, and the environment, should be human being(s). Structuring a value system in accordance to his understanding and apprehension of the world and himself, and translating it into a system of preferences and needs, as well as motives and institutions for their fulfilment, through the definition of societal developmental goals, and through the usage of technology for their practical realization man has reacted differently to the various incentives and limits of his natural environment. The common in all those different answers through the history was the fact that his attitude toward the external world has always been an exact reflec-

tion and manifestation of his inner world.

Hence, what is really important? Basic and less visible, but not less important both direct and indirect or feedback links between the three entities (scientific and technological progress, economic growth, and the environment), play an important role in the dynamic determination of the whole three systems, but until recently this has been unconsciously or deliberately overlooked and neglected.

Science and technology most directly and predominantly determine the way of production of goods and services. Production process through a feedback provides them constantly with new tasks, and for the sake of its own survival industry heavily finance research and development activities. Analysing the way of production and the pattern of economic development one is in a position to shed light not only on the forms but on the very genesis of the existing critical state of the environment and the life itself. Alvin Toffler stressed in his book *Third Wave*: „The fact that in the year 1712 the steam engine was invented and practically used meant that for the first time one civilization had started to eat the natural capital instead of living out of the interest which that capital brings”. [1, p. 123].





According to John Kenneth Galbraith „technology represents systematical application of scientific or other organized knowledge on practical tasks. It's most important consequence, as far as economics concerned, is inevitable division and further subdivisions of such a task, or a problem on its consisting parts. That way and only that way organized knowledge might be practically applied” [2, p. 96].

Production system supported by technology literally insists on endless divisions with the aim of increase of efficiency by means of increased specialization – treating the separated parts as independent from the wholeness, and the wholeness as a simple summation of the consisting parts. On the contrary, ecosystem can not be divided on entirely independent parts (they always preserve and express their complex relation with the wholeness to which they belong). That inevitably leads to a permanent mutual clash and the absence of the harmony between these two systems.

Technology might be successful in ecosystem only if the goals of technology are directed toward the system as a whole instead of being directed to a seemingly extracted and independent part. Ecological survival does not mean and does not require total abandoning and disregarding of

technology. Rather it requires that technology become the result of a scientific approach which is in accordance and harmony with natural environment in which technology is to be placed and used. To an ecological failure of the modern technology corresponds a similar failure in its scientific basis. The absence of coordination and communication among scientific disciplines, and a disintegrated scientific approach to the reality have produced a technology having the same characteristics.

Obviously a mechanical and fragmentary view of the world produced a deep disharmony since the science and technology (and developmental goals based on them) have not respected four, according to Barry Commoner, basic ecological laws:

- (1) In the circular movement everything is connected with each other;
- (2) Nothing disappears forever, only appears somewhere else – always;
- (3) There is no such a thing as a free lunch – one way or the other the costs must be paid;
- (4) The nature is always right. [3, p. 38].

The role of energy

In the beginning of the industrial age energy was abundant and cheap and has become universal means for overcoming



of all sorts of scarcity and a means of substitution for other factors of production – labor, land and capital. As a result there was an increased usage of energy per unit of production before oil shock. The answer to oil shock was technological progress which reduced the consumption of energy per unit of final products, but the total number of produced products has been constantly increasing. Economic growth showed itself as the only means of sustaining the profit rate stability. Severe scarcity

of natural resources (oil) on the world market was sufficient to change only technology (way of production) but not the logic based on profit, which creates the need and request for ever growing industrial production. Table 1 shows a perspective of energy consumption, where:

- (1) Total primary energy supply in PJ;
- (2) Total energy consumption in PJ;
- (3) Energy intensity of economic activity divided by GDP in GJ/1000 US dollars;
- (4) Energy intensity per capita GJ/capita).

Table 1 – Key energy sector statistic and projections

	1998	2020 projected	Total change (1995 2020)
TPES (1)			
OECD	213400	275622	+30%
World	402569	586983	+52%
TFC (2)			
OECD	145155	197768	+35%
World	278244	417460	+51%
TPES/GDP (3)			
OECD	10.9	8.0	-19%
World	15.5	12.9	-13%
TPS/ capita (4)			
OECD	196	221	+18%
World	70	78	+15%

Source: OECD, (2001), Environmental Outlook, p. 146

According to Joke Waller-Hunter, former Director of the Environment Directorate of OECD, despite eco-efficiency im-

provements, overall environmental degradation has persisted in most cases. OECD countries reduced the energy intensity of their economies by 31% in the period 1973-1996, but they increased total energy consumption by 23% over the same period. Their total energy use is expected to grow by a further 30-50% to 2020 [4, p. 1].

In the European Commission document entitled as *Towards a Thematic Strategy on the Sustainable Use of Natural Resources* there is a following statement: „Energy is a key resource for our economy. Overall demand is predicted to grow substantially over the coming decades, by 30% for the



OECD countries and by 70% for the world as a whole in the next 30 years. For the EU, these increases are smaller than the targeted doubling of the economy over the same period; if efforts are maintained, the decoupling of energy use from economic growth will continue. However, energy consumption will still increase in absolute terms [5, p. 16].

The economic growth depends on increasing usage of material and energy in absolute terms. Unfortunately, increased productivity, enabled by the technological progress means increased efficiency with which energy is used and natural resources are transformed into the final products, since the basic definition of the productivity can be striped to the statement that productivity represents the quantity of the goods produced in the unit of time.

Technological optimists overlook the important fact elaborated clearly by the Directorate for the Environment: „An annual economic growth of 3% leads to a doubling of the economy in 25 years. If this growth is realized within the produc-

tion and consumption patterns of today, including the use of currently available technologies, the resource use will grow with a factor 2 as well. In this case there is a 1:1 coupling of economic growth and resource use. Fortunately, this scenario will not happen. The economic growth is not simply realized by doing more of the same. In other words, in the coming decades a considerable amount of value will be created, which material and energy intensity is less than today's products and services. The growing contribution of services to the economy is one reason for this. The ongoing improvement of technologies is another one. Nevertheless, the increase of energy and material use will be considerable, e.g. the energy use in OECD countries is expected to grow in the next 20 years by 35% and by 51% worldwide. This means that economic growth and resource use are decoupled to some extent. In other words, resource use is growing, but less steep than the growth of the economy. This phenomenon is called relative decoupling. Absolute decoupling would take place if the growth of the resource use would be negative" [6, p. 7]. Experts did take into account expected technological progress, but still envisage significant increase of the quantity of natural resources used. Consequently, the assimilative capacity of the environment will be significantly endangered. We think that additional comment is not necessary.

Technology and development goals

What is the role of technology in the process of definition and redefinition of social development goals? Technological optimists say that technology is value



neutral and the only problem is that technology is fulfilling wrong goals. The solution, according to them is to change the goals of economic development and accommodate technology in a proper way. But our opinion is that view is oversimplification of the reality and that the process of defining and redefining societal developmental goals is a much more complicated dynamic process. In an attempt to understand properly the connection between technology and societal development we would like to stress two important questions:

- Is man in a position at all, and if he is, to what extent he is able to control and directs development of technology toward desired goals; or the technology behaves as an independent entity which does not respects our wishes and following its inherent developmental direction and dynamics go far beyond our ability to control it adequately.
- Are there some feedbacks through which existing technology influences the very possibility, but also the extent and direction of the change of the system of social values and preferences, and consequently the change of socially desirable developmental goals?

On the Chart 1, we would like to offer an original schematic representation of the role of technology in the process of creation and redefinition of developmental goals with important feedbacks that play crucial role in the whole process.

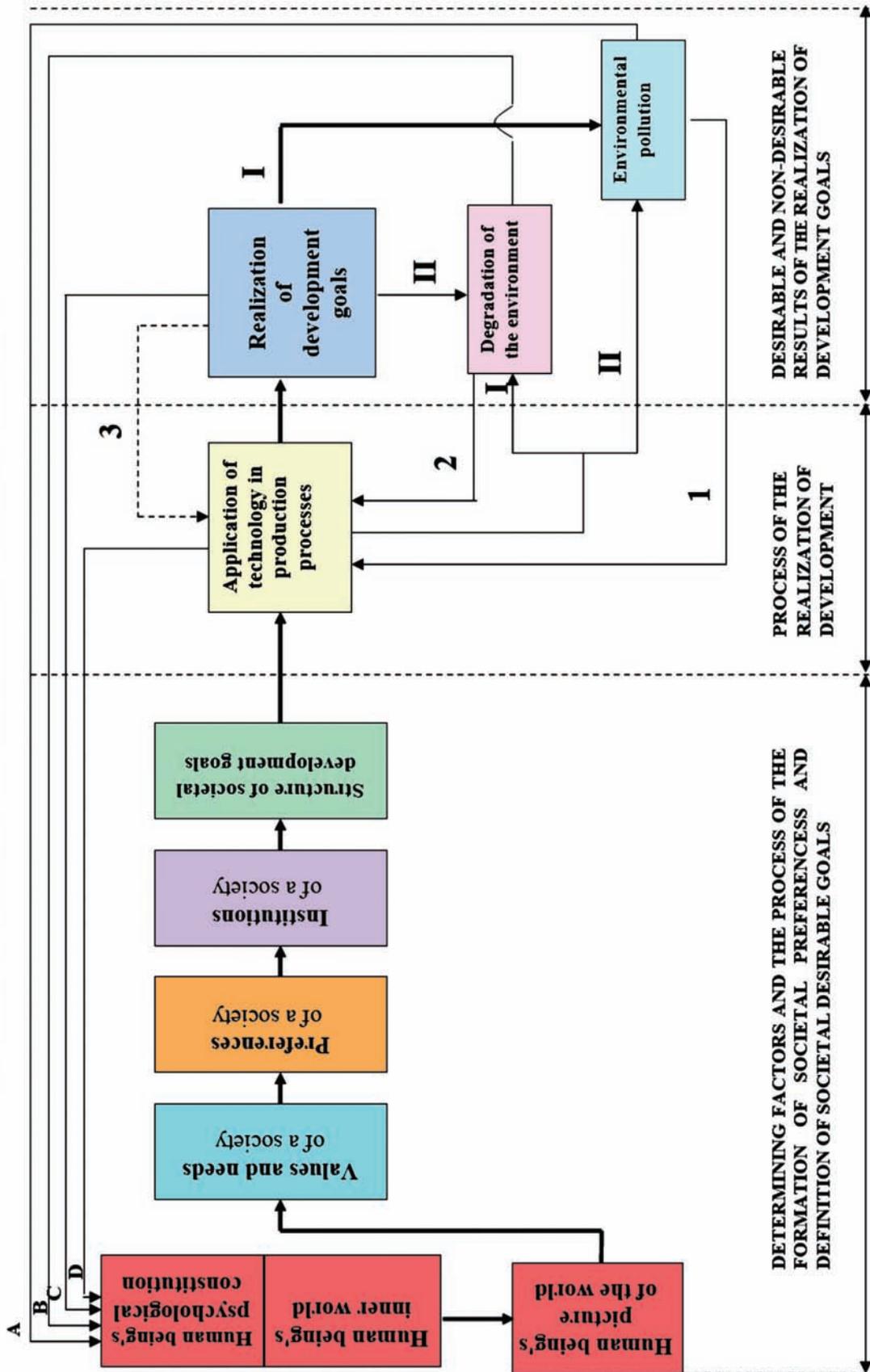


Conclusions

Based on previous analysis one can draw the conclusion that technological progress and more efficient usage of energy can NOT be the answer and final solution of the energy crisis and the global ecological crisis, if we stick to the existing logic of the profit as well as to the ideology of continuous economic growth, measured primarily as an increase of the gross domestic product.

The simple truth is that all our activities are the expression of our self-comprehension. Technology irrevocably changes not only individual but also total social knowledge and experience. Through the constant change of the external world acting as a factor of the creation of conceptual world of the society as a whole, technology predominantly influence the possibility and the character of all future choices (definition and redefinition) of desirable developmental goals. One of the main tasks is to redefine the economic development and create radically different technology – more environmental and human friendly.

Chart 1: THE ROLE OF TECHNOLOGY IN THE PROCESS OF DEFINING AND REALISATION OF GOALS OF A SOCIETY AND DEGRADATION OF THE ENVIRONMENT



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Benchmarking of European Human Resource

Simona Nicolae

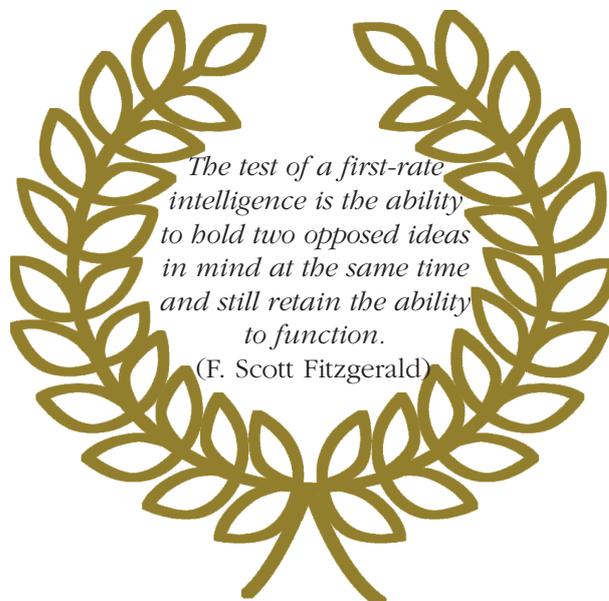
Univerity „Politehnica” of Bucharest

Abstract

Talking about the quality of human resources is equally talking about progress and sustainable development, efficiency and social protection, present and future and not at least about a society where everyone matters or should matter. The importance of human resource quality derives both from the social and economic reasons.

A high-quality human resource lays the foundations of a value-based society and doesn't overload the social and economic costs. This paper aims to approach an indispensable aspect of human resources in Romania, their educational level, and to compare the developments recorded in Romania and other six EU countries that have become in the last 10 years the adoptive countries of a greater or smaller number of Romanian (Spain, Italy, France, Germany and UK) or can be considered a standard of investment in human capital (Finland). To what extent there is a national strategy and how far or fast it will produce useful effects, what are the chances of recovery of human resources no longer found neither in employment nor in education and what are the trends in the EU regarding the quality of human resources, are aspects that will be attained directly and indirectly in the following.

Keywords: education, training, human resources



INTRODUCTION

Education is the essence of the individual and is what allows him to be the manager of his own life, able to take rational decisions, to face the unexpected changes and go beyond obstacles with intelligence. Ignoring education, both by individuals and by society, leads to deprivation, economic and social regression, up to exclusion.

The human development paradigms emphasize its role, considering education as the main tool for obtaining welfare.

Its importance has been imposed in the economic, social and political life, maybe not at maximum but at a level that it would have to obtain results in a medium time horizon.

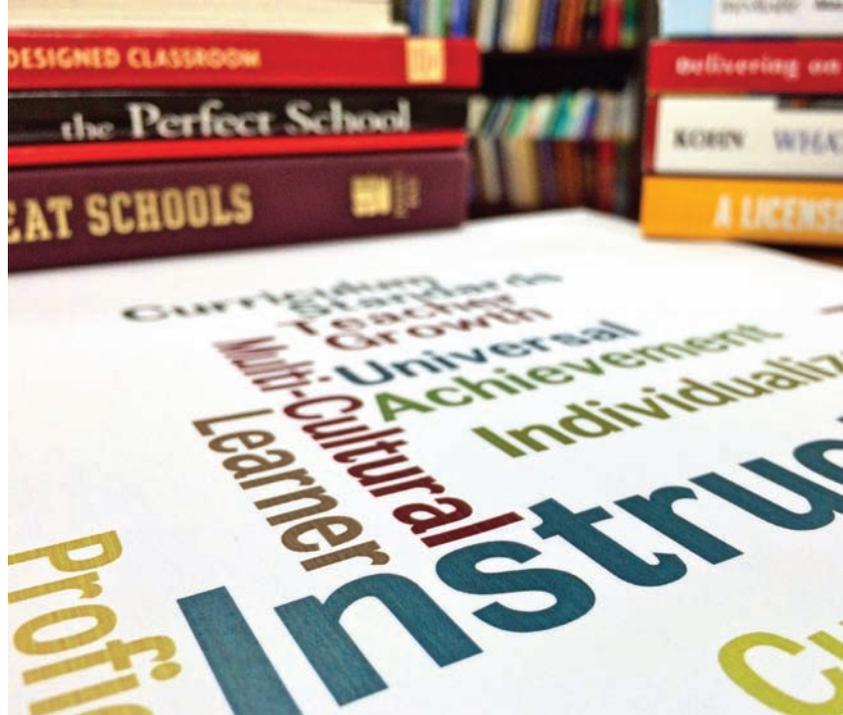
And still, despite the overwhelming importance of education in getting welfare, the awareness about this issue among Romania's population is very small.

In a world in which the economic mechanism works increasingly relying on human capital and talent, Romania is trying to convince his human resources to go through the elementary school years. Promoting fake values in the society and the high cost of living determine a break between educational system and labor market and also generate a high percentage of early leaving in educational system. This trend affects more or less a lot of EU countries. But, for Romania, the general government expenditure on education as a proportion of GDP is the lowest in the EU by a substantial margin and has fallen steadily since the onset of the crisis, reaching 3% in 2012. According to Romania's 2014-2017 Convergence Programme, total public expenditure increased to 3.3% of GDP in 2013 and is expected to stay at that level until 2020 [1].

Literature review

Investing in education and training plays a key role in the present economic and demographic context, as underinvestment in human capital risks undermining Europe's prospect for sustainable and inclusive growth. [2]

General consensus highlights the positive association between education and



labor market returns. The fact that individuals with a higher level of education tend to get better and more highly paid jobs than those with lower levels of education raises the question of whether these better labor market outcomes truly reflect the level and type of education, or whether they reflect another variable that can be linked to both the education choice and the labor market. [3] But this connection cannot be done in a classic way. Recent developments in the world economy have imposed the need to encourage new models that promote both education and talent skills.

The leaders of a school also need to display and enact other strategic leadership skills and attributes. We would highlight three:

- (i) strategic talent developers are strategic thinkers;
- (ii) strategic talent developers are strategic learners;
- (iii) strategic talent developers exert strategic influence. Strategic influence is based on how leaders gain commitment to the vision and direction of the school from those who work and learn in the organization. If the school

is not only to achieve improved outcomes and outputs but to do so in a sustainable way, then involving others and getting them on board is critical to its achievement [4].

School must meet the needs of two categories of users: on the one hand the school-age population has to be attracted and persuaded to participate actively in the educational process and on the other hand the company should provide the framework and support to obtain useful effects from educational process.

School must build conscious value system even if this implies an earthquake in the school age population. The problem is the lack of interest of those involved in achieving a national education strategy to counter the effects of these earthquakes.

Assuming a lower graduation percent or increasing the number of those who leave school early can be a starting point for reassessing the role of the educational

system but is not sufficient. Long-term losses are difficult to quantify and effects are hard to refute.

Content

The quality of human resources lies in its ability to become economically and socially useful and it is measured, among others, through the effects of investment, owned or not, in education and training. The easiness of the transition from school to work and the human resource capacity to adapt to change are two examples of such effects highlighting the quality and usefulness of human resources.

The quality of human resources is also the main element of concern in Europe, being found in 4 of the 5 fields related to the EU2020 strategy. The data provided by NIS – National Institute of Statistics (Fig. 1), shows that Romania recorded, at least since 2009, a decline in the rate of enrollment in education for all ages.

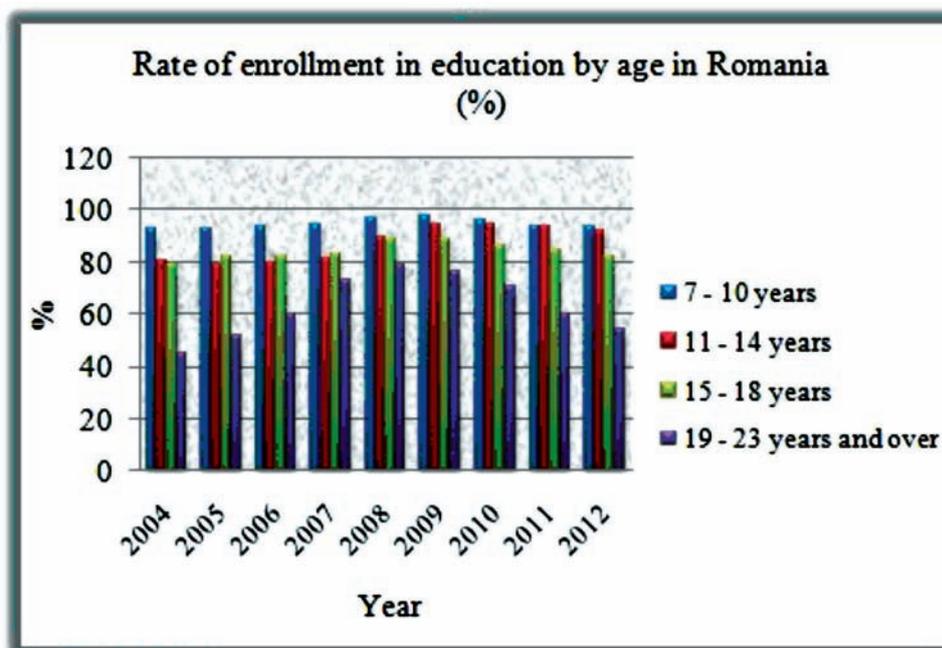


Figure 1 – Rate of enrollment in education in Romania

Source: INSSE

Even in the age of compulsory education and free enrollment in education this level does not reach 100%. So if the age group 7-10 years in 2009 registered a maximum value for this indicator, 97%, in 2012 it reaches only 93%.

For the category of 11-14 years old in 2009 the enrollment rate was 94%, 3 percentage points higher than in 2012. For the category of 15-23 years the situation is even more alarming as the small percentage of participation shows disinterest or difficulties in accessing vocational training.

Moreover, poor acquisition of basic skills, absolutely necessary to pass to the training phase, decreases the quality of human resources.

In the EU only 4 countries is at the maximum 15% target set for the indicator „Low achievers in basic skills” [5]. Romania ranks 2nd following Bulgaria in terms of this percentage, exceeding 35%. Without these basic skills human resources will fail to undertake the transfer from school to work.



In the following we'll present what are the main trends at European level related to the share of labor resources with a certain level of education in the total population of the same age.

The choice of European countries for comparative analysis was based on the percentage of Romanians who live or work in them and which, less or more, has created to next generation the illusion of very bidding economic areas from the labor market perspective (Spain, Italy, France, Germany and U.K.). The choice of Finland consists in the fact that it pays a great attention to the quality of the human resource being considered a benchmark for the European knowledge society.

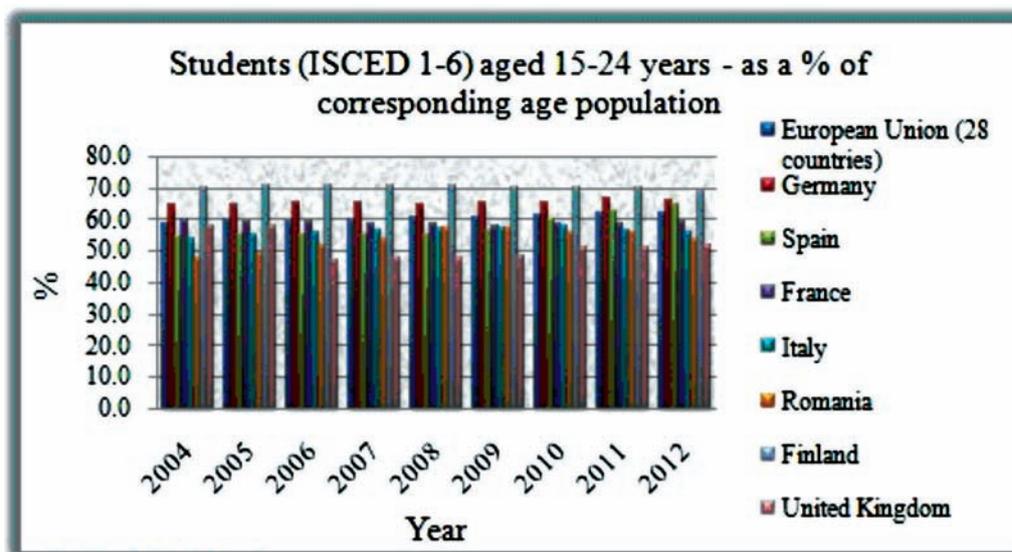


Figure 2 – The share of persons enrolled in EU education

Source: Eurostat

According to EUROSTAT, the share of persons enrolled in education and training, considering all levels (Fig. 2), in the total population of the same age confirms data from NIS, ranking Romania the second low-

est, before UK, for the age group 15-24 years. This evolution is strongly correlated with the rate of early leaving from education and training [6].

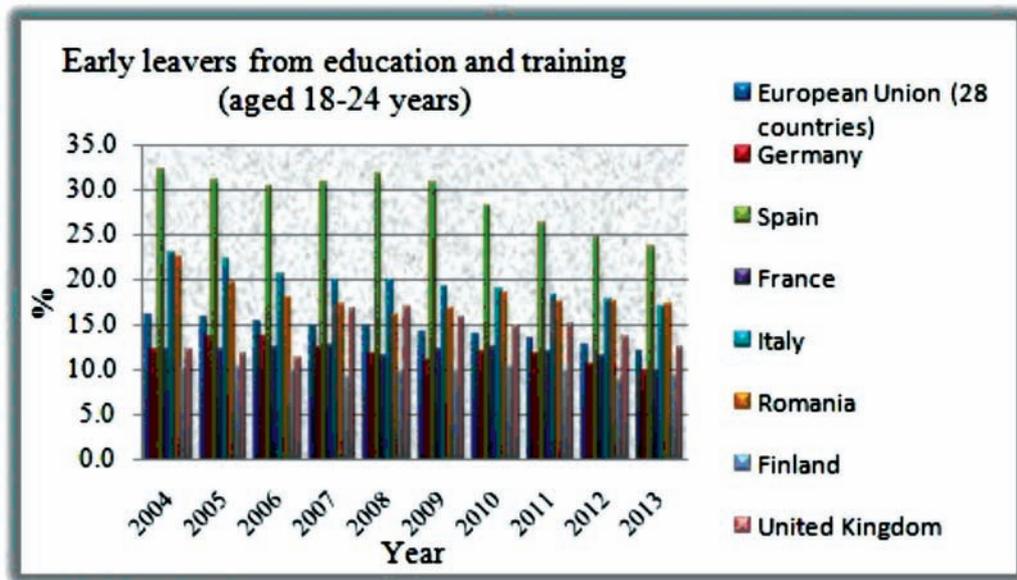


Figure 3 – Early leavers of education

Source: Eurostat

Romania was ranking 3rd for 9 years in the selected countries top in terms of the percentage of those who left school early (Fig. 3), and in 2013 overtook Italy and ranked 2nd.

In this situation the chance of young people to find a job in countries facing the same problems as Romania is very low. Italy and Spain for example register an alarming percentage of those who leave school early. In addition the unemployment rate for young people under 25 is 55,5% in Spain and 40% in Italy. Romania with 23,7% is at the EU 28 average.

Romania is also facing a phenomenon that has grown in the last 4 years, respectively the dramatic fall of high school graduates who do not pass the baccalaureate exam. A small percentage of those who pass the baccalaureate exam shows on the one hand, the lack of interest of

young people in finishing their studies and on the other hand a bad omen way to finish their grade and pass to a superior one. As long as a large proportion of students is not able to pass the baccalaureate exam, it is evident that all of those in this situation were over scored during their study years (Fig. 4).

For all these young people who come from theoretical high schools in most cases, failure Baccalaureate exam is presented as a wall between them and the labor market. We will see later that Romania rank 1st among the selected countries in terms of the percentage of human resources with secondary education in the total population of the same age. A qualified population with secondary education can lead Romanian economy to an ascendant trend but a population with secondary education and no competence

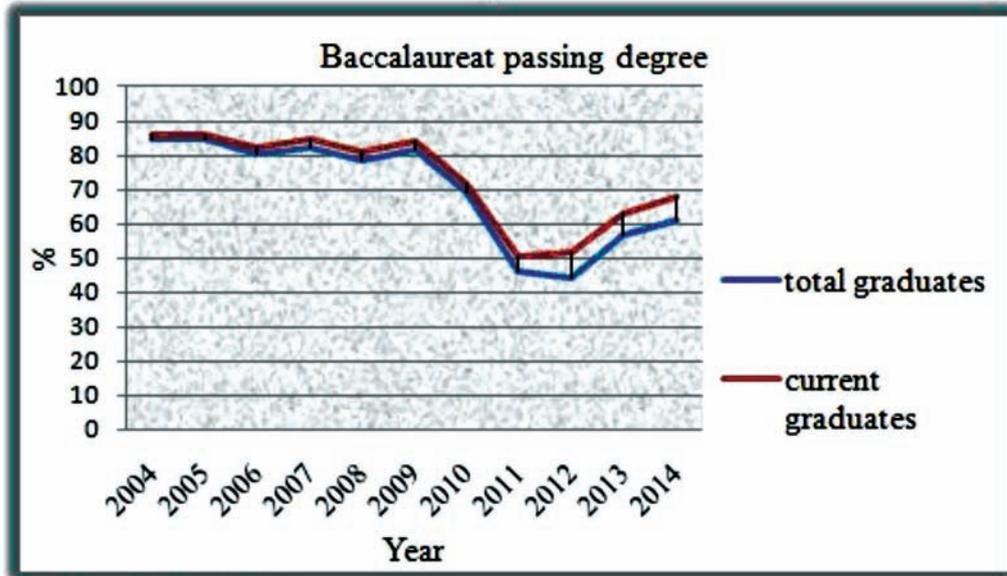


Figure 4 – Baccalaureate passing degree

Source: www.edu.ro

is nothing but a brake on any attempts of economic development.

Besides, this explains the high percentage of young people aged 15-24 who are neither in education nor in employment

(Fig. 5). In 2013 Romania ranked 7th among EU countries with young people aged 15 to 24 who are not in either of the two categories and ranked 3rd in the top of selected countries.

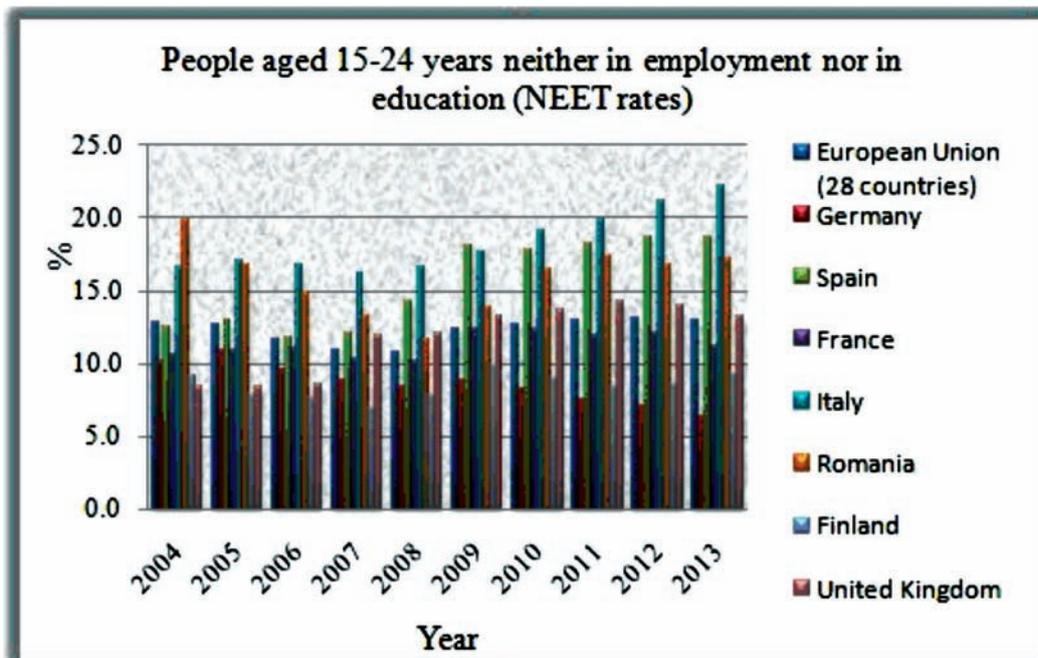


Figure 5 – Young unoccupied people in EU

Source: Eurostat

Among the countries chosen for comparison, Germany is the one that has the lowest percentage of human resources who attended only lower secondary education. Romania is at the EU average while Spain and Italy have an „inflation” of lower

secondary education human resources (Fig. 6).

Finland, France and UK have reduced their share of this category even though not significantly.

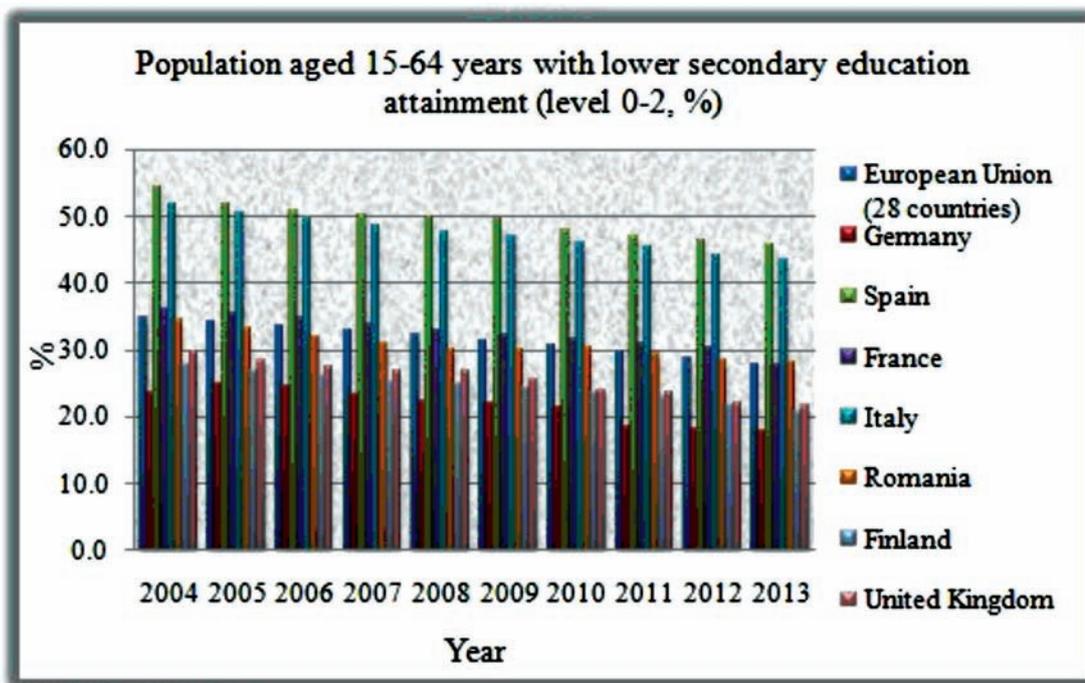


Figure 6 – Lower secondary education

Source: Eurostat

Regarding labor resources assigned to upper secondary attainment, Romania is, as mentioned, in the top of the countries considered for analysis, along with Germany. (Fig. 7)

If we interpret this graph singularly, the situation may seem satisfactory; however, we'll see that the high percentage of this group compensates for Romania the small percentage of the human resources with tertiary education attainment. Moreover, human resources with a medium educational level are professionally qualified in Germany while in Romania those in this category do not complete their studies.

Moreover, the National Employment Agency (NEA) organizes training courses designed especially for people with primary or secondary education, persons for whom are registered the most of the vacancies (91,22%).

In the year 2014 out of a total of 37,438 unemployed people who attend training courses, about 83,51% were persons with primary and secondary education [7]. The problem is the concordance between the content of these programs and labor market needs. According to the NEA, jobs that will be required to organize for training programs in January 2015 are: trade

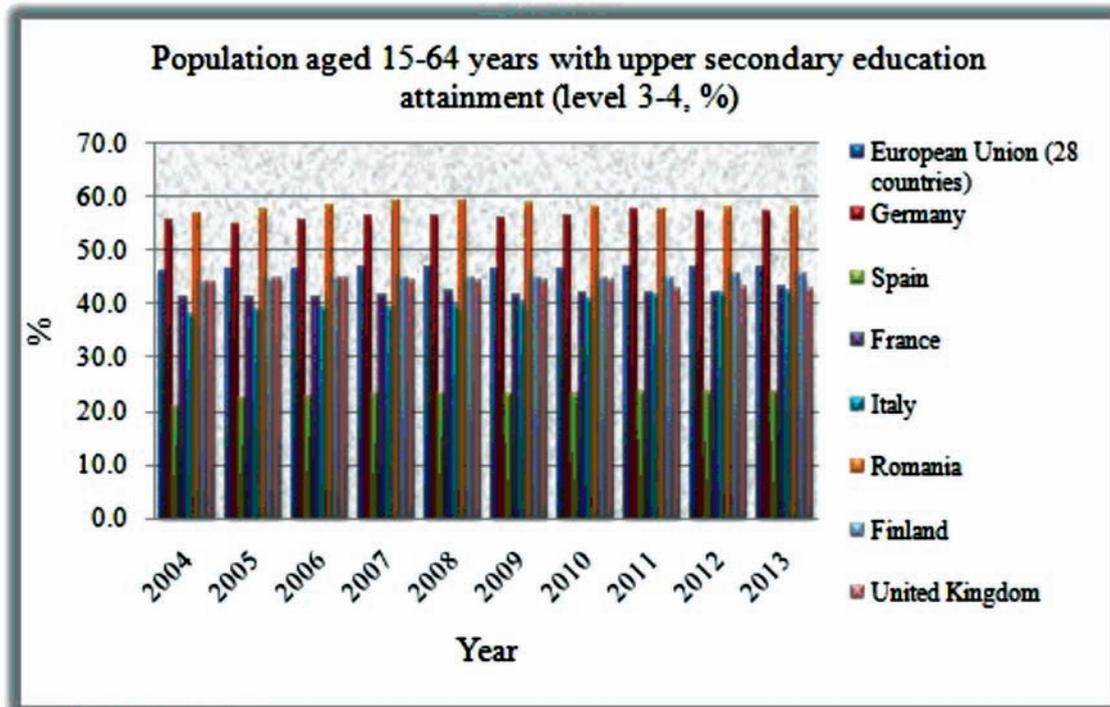


Figure 7 – Upper secondary education

Source: Eurostat

worker, inspector (referent) human resources, communication in English, cook, waiter seller catering facilities, hairdresser, operator input validation and data processing, accounting, caretaker for the elderly, while, according to the same source, most available jobs are related to the garment and textile industry (18,4%). Also, for commercial workers are available at national level 544 job vacancies while in training courses for this job are included 2778 unemployed.

In this situation the quality of training does not affect the human resources quality with secondary education but the usefulness of these courses not adapted to the needs of the labor market.

In terms of population with tertiary education the largest share is in the UK, Finland and Spain, followed by France and Germany. (Fig. 8)

Italy and Romania are ranked last of the

6 selected countries, although in the past 10 years this indicator has also increased. Workplaces officially available for people with higher education are also very few, 8,78% of the total in the year 2014 while the unemployment rate for this category reached 5,8% in 2013 and an average of 5,7 % for first 3 quarters of 2014. The consequence of these developments was and is a constant decrease in the share of students in total school population, since 2009. In this situation how Romania will be able to reach 26,7% for those enrolled in tertiary education? And this one is a national target not an EU one (40%).

Discouraging human resources to invest in training and to transform themselves into human capital also results from the evolution of participation rates in adult learning across the lifetime.

For Romania, this indicator is almost the lowest among all EU countries, 2%.

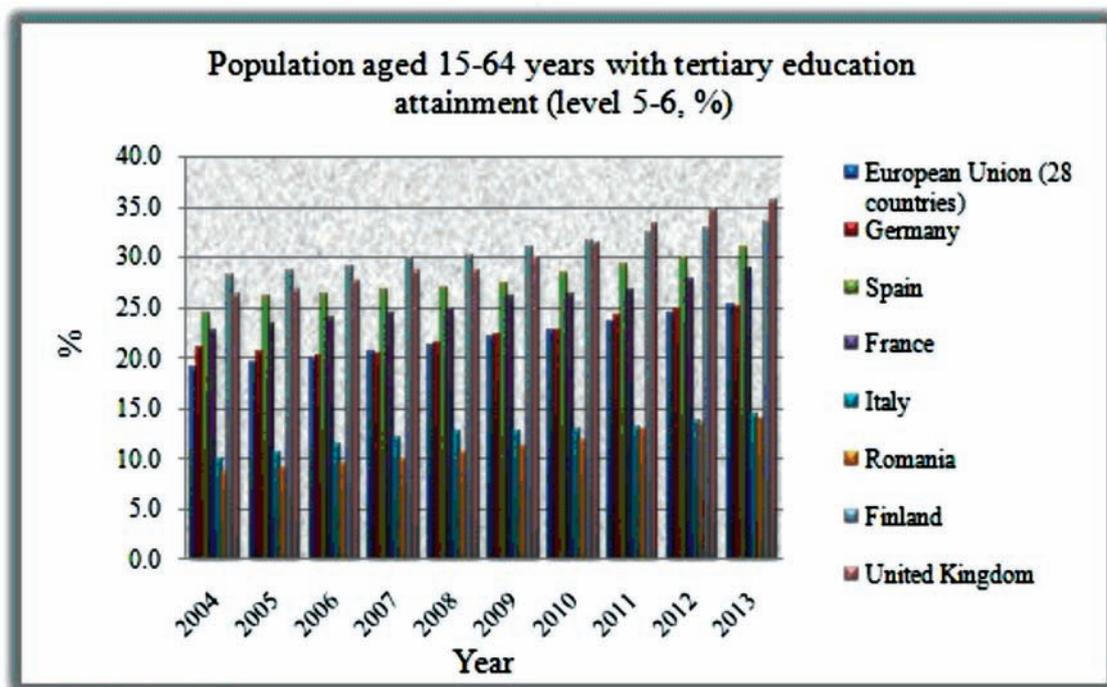


Figure 8 – Tertiary education

Source: Eurostat

Only Bulgaria has registered a lower value. In the year 2013 a total of 36,949 persons were included in training courses, fewer by 23% compared to 2012. Of these, 97,7% were unemployed and only 43,7% of them found a job. National Survey on Participation in continuing training, published in 2011, identifies the most important barriers to participation in lifelong learning: limited financial incentives for the individual, but also for the employer, limited information on population about the supply of training courses, lack of flexibility of existing training courses, limited access to the system of recognition and validation of skills acquired in informal and non-formal contexts [8].

For 2015 the National Qualifications Authority (NQA) and the Ministry of Education (ME) aims to support training for more than 1 million people without completed compulsory education by creating

low-skilled occupations, respectively Classification of Occupations in Romania group 9, through GD. Also, NQA sustains young people having graduation documents recognized by European labor market: generalized Europass Passport, through GD [9].

Measures should be taken and will have to produce effects very quickly because all these human resources will become unusable in a time horizon closer or farther and will raise social and economic costs of Romania.

Conclusions

The quality of human resources is, among other factors, an essential input of sustainable economic development both at national and at EU level. By the quality of human resources depends achieving goals and creating and implementing a strategy directed towards it.

Although Romania has a plan of action in this direction and also, coordination and aid from the European Union, it faces difficulties in getting real positive results.

Measures have been taken and the consequences did not fail to appear. Low graduation for high school students has sounded the alarm on the procedures and the quality of education and training. The question is: what do we do from now on? How can we integrate all these young people that in a few years will become unusable? And what is the strategy in order to prevent proliferation of this phenomenon?

According to analysis of the Council of Europe for Romania „following a sharp decline in vocational education and training in the last 20 years, several reforms and pilot projects have been initiated in recent years but the availability of vocational education and training, its relevance to the labor market and business involvement in work-based learning and apprenticeships remains low. Important skills mismatches persist for tertiary graduates and the link between business and academia remain weak (...)” [10] All these because, as the same report outline, „The Education Reform of 2011, which set a long-term agenda for upgrading the quality of education at all levels, is not yet fully operational, due to insufficient financial and human resources.”

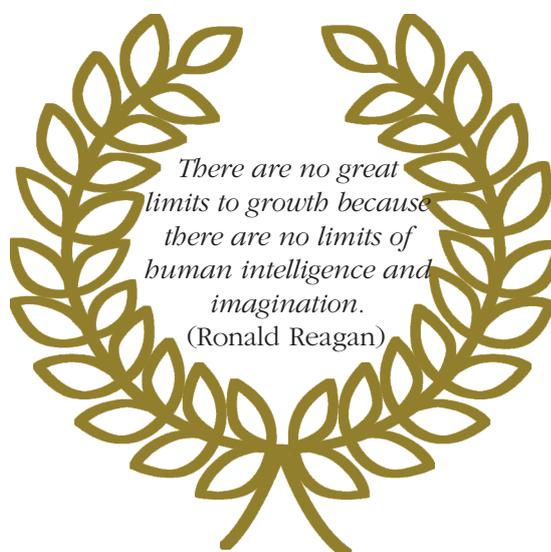
A strategy to increase the quality of human resources which remains just a simple document, does nothing more than give the impression that things are moving in the right direction. Outputs of the educational and training system show something else and these outputs will become the poor quality labor market inputs.

In 2020 Romania should achieve some targets in order to be considered an econo-



mic and social equal partner of other EU countries. How can these goals be achieved in the absence of human resources able to coordinate and apply all the necessary measures will see over time.

The investment in human resource does not produce wealth immediately as ignoring it does not damage immediately. When the effects appear, however, their tracks can last generations especially in the case of negative effects. Highly qualified human resource will find its place in the labor market regardless the country that will host it but unskilled human resources with educational dropout base will become ballast for the future of Romania.



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The Emergence of the Virtual Enterprises

(1) Iuliana Grecu, (2) Ileana Ghiță

(1) University „Politehnica” of Bucharest, (2) Wing Computer Group, Bucharest

Abstract

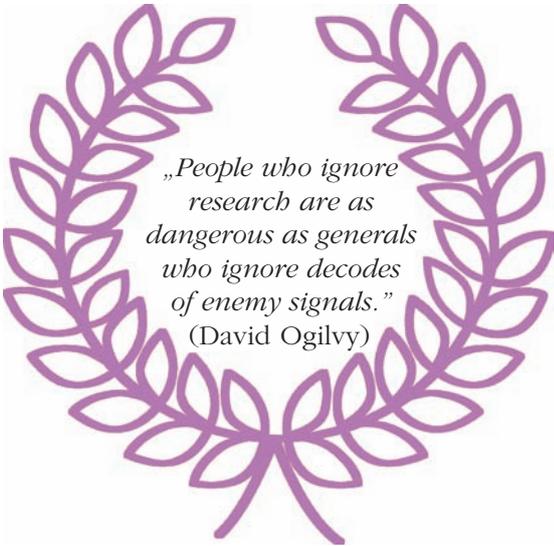
In order to be successful, an organization must adapt permanently to market requirements. Adaptation assumes the access to newest information, but also a rapid capitalization of them. For this, a solution can be the possibility that more companies collaborates to form a virtual organization, or in case of one organization only, that one to exist virtually on the internet and not necessarily to have a physical presence. This paper aims to focus on the aspects highlighted by such a „project” and on the way that a virtual organization can eliminate or solve many of the problems that occur for single traditional organization.

Keywords: virtual organization, information, adaptation, technological support

INTRODUCTION

In the literature there is some disagreement about what exactly a Virtual Organization (VO) is. Different authors mention different definitions, reflecting the novelty of the term [3], [4]. It also appears that a variety of terms are used indifferently in order to refer to virtual organization, such as virtual enterprise, virtual company and virtual corporation.

Today's organizations are faced with a dynamic and turbulent environment that requires flexible and fast responses to changing business needs [5]. Many organizations have responded by adopting decentralized, team-based, and distributed structures [6] variously described in the literature as virtual, network, and cluster



*„People who ignore
research are as
dangerous as generals
who ignore decodes
of enemy signals.”*
(David Ogilvy)



organizations. Advances in communication technologies have enabled organizations to acquire and retain such distributed structures by supporting coordination among people working from different locations. Despite the rapid increase in the number of organizations that are becoming distributed, little is known about the structure or performance of such organizations. The aim of this paper is to examine network structure of a virtual design organization using a social network approach.

CONCEPT DEFINITION

Davidov and Malone in their paper: „The virtual corporation” [1] are credited for initiating the discussion on virtual organizations use the term *virtual corporation* to refer to a very broad concept encompassing any new organizational form, inter-organizational forms, etc.

Other definitions that can be found in the existing literature include:

„Virtual organization is a form of cooperation of legally independent companies of people contributing their core competencies to a vertical or horizontal integration and appearing as one organization to the customer.”

K. Laudon, J. Laudon and other authors [2] claim that virtual organizations are „Organizations using networks linking people,

assets and ideas to create and distribute products and services without being limited by traditional organizational boundaries or physical location”.

Travica gives a more comprehensive definition of the virtual organization: „Virtual organization refers to a temporary or permanent collection of geographically dispersed individuals, groups, organizational units – which do or do not belong to the same organization – or entire organizations that are dependent on electronic linking in order to complete the production process” [15].

While virtualization has simplified the way IT provides access to computing resources, the success of the technique has led to some unexpected challenges. After a rapid initial uptake, growth in the use of virtualization can hit a wall, because the ease of creating new virtual functionality has not been matched by a growth in the ability of IT departments to manage the complexity of the virtualized world they have created.

The problem with the expansion of virtualization is that each asset needs care and feeding, configuration and monitoring, security and disaster recovery, regardless of whether it is physical or virtual [7], [10].



MAIN CHARACTERISTICS OF VIRTUAL ORGANIZATIONS

- *Dispersion.* Virtual organizations break the barriers of space and times, which may even lead the virtual organization to become a 24-hour organization, thus improve its responding to customers.
- *Based on core competencies.* Core competencies form the fundamental nucleus of Virtual organizations. The combination of all core competencies leads to synergy and enables a flexible way of meeting the customer demands virtual organizations. Globally dispersed firms, individuals, material and information resources come together in a VO by becoming connected through communication and information flows. Important for a VO are the advances in transportation, communication and computing and particularly the Internet.
- *Customer based and mass customization.* A virtual organization is focused on customers, who ask for individual products. Virtual organizations should arise from a response to customer need and it should disintegrate with the fulfillment of that need.
- *One identity.* The virtual organizations must have its own identity and although it can consist by many partners it should be recognized as one by customers.
- *Interdependence.* Interdependence among partners differentiates the virtual enterprise from traditional ones. Participants share accountability and responsibility for the success of the enterprise as a whole, as well as for their particular portion of its operations and they are involved more or less actively in all enterprise operations.
- *Based on trust.* There is need for trust at all levels i.e. between management



and employees, management and managers, employers and employees, and customers and organizations.

Regarding virtual organizations there are two levels of discussion [8]:

Enabling technology (the platform, e.g. applications, components), enabling information to be created, distributed, consumed (e.g. interoperability, standardization, security, speed).

Virtual organizations design, or what is delivered over the platform (how we create, organize, distribute and consume information, how it supports the virtual organizations at operational level (procedures), tactical level (business processes) and strategic level (business value).

Supporting Technology issues: Infrastructure interoperability/standardization; Security, business continuity, disaster recovery; Trends.

Virtual organizations design and operational issues: VO Research status; VO Theory and reference models; VO partners identification and trust; VO partners interoperability; VO design; VO management; VO Knowledge management.



BARRIERS IN DEVELOPMENT

Norton and Smith [12] have identified three main barriers to the development of the virtual organization:

- *Inadequacies in the existing hardware and software infrastructure.* However, this does not seem to represent a serious constraint in the development of virtual organizations.
- *Organizational and management attitudes towards people and technology.* This is more likely to affect negatively the move toward virtual organization, since most organizations retain a command and control structure, which is resulting in resistance to change due to fear of the uncertain.
- *The reluctance of individuals to adopt a flexible approach to employment.* This again raises the issue of resistance to change. According to Malone and Davidow [1] employees will need to be continuously trained and come to

terms with the fact that they may go to work each day not knowing what their job will be.

In general, it appears that the main barriers are no longer seen as technological, but rather as cultural. The importance and the enabling role of Information Technology [11] are discussed in the following section.

EXAMPLE OF VIRTUAL ORGANIZATIONS

An example of Romanian virtual organizations can be helpful. Transaction Romania, is a dynamic company in the field of financial investments services. The company was founded in 1997 and is a member of Romanian Brokers Association and stockholder of Stock Exchange Bucharest and The Commodities Exchange Sibiu. The company has started in 1998 to offer market analyses for own customers and now has a flexible array of services to offer. Their organization structure is flexible, dispersed and based on information technology. The modernization of their IT department has lead to continuous changes in the way to control business and to answer to customers demands.

The problem for IT departments is that virtualization puts them on a road where they start to take on many of the responsibilities of a cloud vendor. When an IT department offers virtualized resources, the staff must be able to manage their configuration along with the configuration and capacity of the physical servers supporting the virtual devices [9], [13]. Here's where things start to get tricky.

Some of the virtual services are focused on consultancy. The customer can download a pdf file that must be completed and

send back. Some other services are designed to work on-line with customers, for daily brokering activities. This virtual

partnership between customers and broker agents can become more trustful in time, allowing initiative on the Stock market.

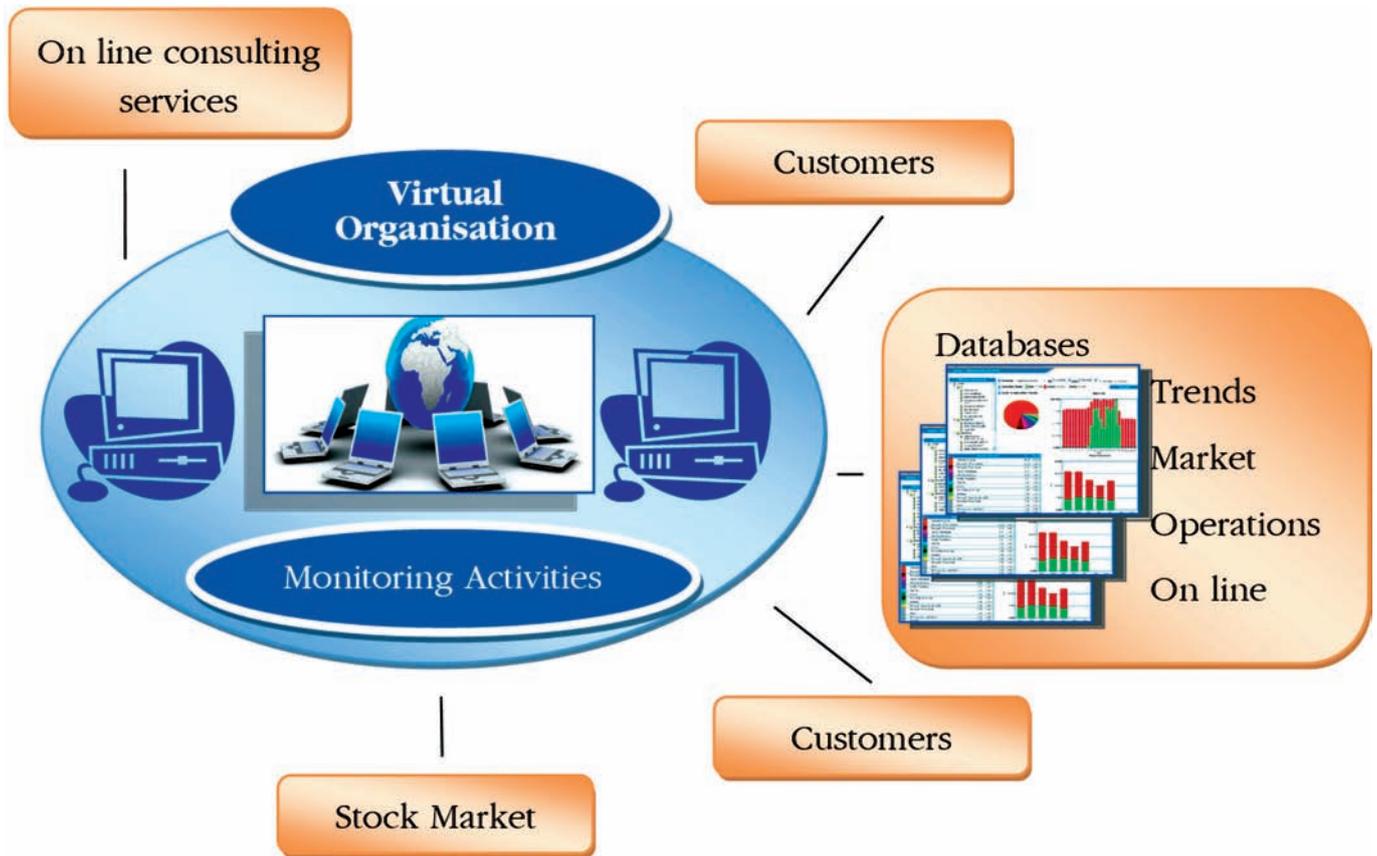


Figure 1 – *The structure of a virtual organization in financial investments services field*

The organizational structure of the company did not change drastically in the last 12 years. No other management personnel was included, only analysts and brokers. That mean the company remain not very strictly hierarchical [10].

In the same time, the work nature of the personnel has changed substantially. The advance in communication and IT are replacing old connection channels, consisting in telephone wires and hand write documents to newer ones, with data in electronic format, more panels to monitor activities and different connecting environments: secured e-mails, fax, voice-over IP,

and different personalized network applications. Having more powerful IT tools at their disposal, same number of management personnel is solving today more tasks.

Also the access of customers to experts' opinion about companies in the stock portfolio is easy and open. One should only registry on the web site and submits his demands to company experts. The return is a certified analyze of company situation that help the customer making decisions, regardless their momentary location and connectivity.

Conclusions

Our results suggest that virtual organizations may well be non-hierarchical and decentralized from an authority standpoint; however, from a communication standpoint they may still be hierarchical and somewhat centralized. The reason for this rests in the communicative efficiency and robustness of the hierarchical form and in the benefits of role specialization.

Virtual organizations allow relatively easy access to people in the know by making it easy to obtain information from experts, regardless of where they are located. The communication patterns evolve such that efficient use of this expertise can be made. If the expertise resides in a small number of specialists, then all inquiries will be directed at these individuals. In an area where there are high knowledge barriers to entry because of the high level of technical expertise required, centralization can play an important role in overcoming these barriers. Specialists who can be relied on so that all participants do not have to share in all the knowledge can reduce startup costs for the average participant. Centralization of communication to these specialists can increase group efficiency.

Managers can foster a hierarchical communication structure by promoting spe-

cialization in knowledge areas so that all communication regarding a particular area is directed through a single individual. On the other hand, complex tasks should be managed to promote plenty of discussion and decentralized decision-making. This should lead to enhanced innovativeness and creative solutions. Such task directed hierarchical (or non-hierarchical) structures can also be promoted through specially designed computer-supported communication systems.

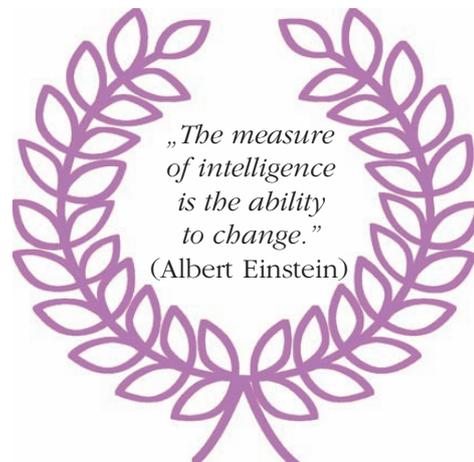
We also found evidence that in this virtual organization, as in traditional organizations, the structure was matched to the task characteristics. However, unlike traditional organizations, this fit between communication structure and task improved the perception of performance but did not appear to improve objective performance.

It is quite simple to make changes in virtual organization structure because of the nature of tasks, but changes must be very well analyzed and implemented because they can have negative impact for a business, if that business is not seen as a whole. Analyzing only part of a business can be dangerous because positive effects for some parts can be insignificant if we are not able to see the negative effects for the rest of the business.



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BUILDING QUALITY

Quality is never an accident.
It is always the result of intelligent effort.

JOHN RUSKIN



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The whole is greater than
the sum of its parts.

ARISTOTLE

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Technology is nothing. What's important is that you have a faith in people [...] and if you give them tools, they'll do wonderful things with them.

STEVE JOBS

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AND ROMANIA**

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**MOBILE PAYMENT – RISKS OF
A NEW TECHNOLOGY**

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Beauty is unity
in diversity.

JOHANNES SCOTUS ERIUGENA

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March 2015

TALENT MANAGEMENT

My main job was developing talent.
I was a gardener providing water and
other nourishment to our top people.

JACK WELCH

**THE ATTRACTIVENESS
OF EMERGING TOURISM
MARKETS**

Azilah Kasim, Cezar Scarlat

**MANAGEMENT
INFORMATION
SYSTEM FLEXIBILITY**

Mieczysław L. Owoc, Marek Skwarnik