INTEGRATED MANAGEMENT SYSTEMS AS THE SOURCE OF THE ENTERPRISE COMPETITIVENESS INCREASING

Anatolii ZADOIA*,
Svitlana PETRENKO**

Abstract: *The analysis of the modern approaches to the creation of an enterprise management system, operating under conditions of dynamic changes of the external economic environment, is presented. In this article it is shown that a significant method of improving efficiency and competitiveness of enterprises is using an integrated management system and the transition from the rapid vertical hierarchies to more flexible horizontal structures. The method for determination of the parameter of BSC system is offered.*
Keywords: integrated management system, balanced system of indicators, business processes, competitiveness of the enterprise.
JEL Classification: M_{11}, M_{21}.

1. Introduction

Competitiveness in the market is one of the major characteristics of any enterprise's activity. But if still twenty years ago the market was guided by the definition of a competitiveness which was given by the leading expert in the field of strategy, M. Porter (1998): "Competitiveness - property of the goods, service, the subject of market relations to act in the market on a level with the similar goods, services and competing subjects of market relations presented there", today the concept of "competitiveness" is more difficult and not so much better, concerning the systems of a business enterprise.

We live in a world which is constantly changing. Dynamic, unforeseen changes of the macroeconomic environment even more often

* Dnipropetrovs'k University Economics and Law, Ukraine, zadoya@duep. edu.
**Dnipropetrovs'k University of Economics and Law, Ukraine, svitlana. petrenko@ duep.edu.

have a revolutionary character and have diverse spheres of influence: new technologies, structural geopolitical and economic changes, etc. As reaction to these changes, appears a considerable quantity of scientific theories, new paradigms whose purpose is to grant these or those recipes of survival in modern market conditions, to increase competitiveness of social and economic subjects of the modern market both on macro - and micro levels.

The analysis of different kinds of management systems of the enterprise is a subject of this article. The research objectives are the determination of interrelations of elements of modern models of management, the definition of the level of their influence on a management system of the enterprise as a whole and the development of the methodical estimation of the management system's effectiveness for the purpose of maintenance of the enterprise's competitiveness. In this work the methods of factor analysis and rating estimations are used.

2. An essence of the integrated management systems of an enterprise

In the modern theory and management practice there are many scientific works which are devoted to methods of development of effective management systems of enterprises. Especially it has acquired the urgency since 80th years of last century and till now. It is possible to carry works of following authors to such scientific sources – Deming E., Kaplan P., Norton D., Friedag H., Schmidt W., Kondo J., Lapidus V., Mintzberg H., Adizes I., etc.

The above named authors consider the management system of the enterprise under a corner of maintenance of the general quality of a management system of the enterprise - Total Quality Management (TQM). On the basis of this approach some so-called integrated management system enterprises have developed using models of management such as: the balanced management system of enterprise "BSC", model of consulting group McKinsey "7S", synthetic model of organizational design by Mintzberg H. (1983).

Let's concentrate attention to a substantiation and definition of essence of integrated management systems of enterprise and methods of their creation on the basis of definition of objects of management and synthesis of management elements for the purpose achievements of such indicators of efficiency which supply to the enterprise long-term competitive advantages in the market environment. With that goal we will try to specify the conceptual terminology concerning definition of competitiveness of the

enterprise, as social and economic system, and the term "an integrated management system".

As market conditions are in process of constant changes also level of competitiveness of the enterprise throughout time is changed. The situation largely depends on availability of certain competitive advantages as compared to other enterprises. That is why, agreeing with M. Porter's definition, it would be expedient to specify it thus: *competitiveness of the enterprise is an ability to act in the market, forming and using competitive differences which create advantages in comparison with competing subjects.*

Competitiveness of the organization should supply optimal using of all kinds of economic resources: financial, materials and power, technological, human resources, etc. But effective financial management and investments into physical assets cannot guarantee today significant competitive difference. More essential competitive advantages of the enterprise are formed at the expense of not material assets, such as: adaptive strategic management; efficiency of business processes; a company capital embodied in knowledge and qualification of employees; ability of the organization to keep and involve new clients; high corporate culture which involve investments and stimulate organizational changes, investments into information technologies. Effectively to operate these factors, to unite them in flexible, capable structures to reformatting depending on requests of the external dynamic environment, allow so-called integrated management systems of enterprise.

The term „an integrated management system" is often enough used by modern theorists and management experts, meaning thus not absolutely identical definitions. We will try to understand, what sense is put in this concept.

It is well known, that the term "integration" (from Latin: *integrum* - whole; *integratio* - restoration) - in a general sense means association, interpenetration. Association of any elements (parts) in whole, process of mutual rapprochement and creation of interrelations - the basic concept of integration.

The term "integrated management system" (IMS) has been used for the first time in economy at implementation of the international standards of a quality management system as the part of system of the general management which correspond the requirements of two or more international ISO standards concerning a management system and functions as a unit. For the enterprise implementation of the international ISO standards means application of the processes-role model constructed on

principles TQM: leading, attraction of staff, the process approach, systems approach, constant improvement, decision-making on the basis of the facts, and the mutually advantageous relation with suppliers. Advantages of use of model IMS consist that such model allows not destroying an existing hierarchical management structure, to create new structure of mutual relations in the organization and to displace accents from hierarchical distribution of powers (characteristic for systems of the direct control) to process-role (for monitoring systems and self-checking on the basis of standards and the formalized processes). Therefore for realization TQM it is necessary to establish and distribute accurately three main elements of system management: a) responsibility (charge); b) authority; c) interactions. It should be displayed in corresponding documents (standards) that describe a management system of quality of the enterprise.

It is possible to determine defects of the IMS model as following. First, model IMS cannot be identified with system of the general management of the enterprise which unites all aspects of activity of the organization as it does not extend on financial management, personnel management, innovative management, management of risks, management of stocks, etc. Secondly, this model is constructed on standards and does not consider influence of group dynamics, informal interrelations (so-called "communication constellations") (Mintzberg, H., 1983). In spite of progressiveness of such model concerning use of a human resource in comparison with hierarchical structure, such model remains enough mechanistic, that means its insufficient flexibility at requirement of fast reaction to dynamic changes of the external economic environment.

The similar term "the integrated control system of the enterprise" - ICSE is applied at development of the system of automated management of the enterprise, such as ERP (Enterprise Resource Planning), SCM (Supply Chain Management), CSRP (Customer Synchronized Resource Planning). These automated systems realize the newest information control systems of the enterprise. ICSE allow to supervise over the enterprise in real time on the basis of the actual information, i.e. to make the decision on the basis of the facts. ICSE gives the possibility to supervise over all resources of the enterprise (industrial resources, financial resources, orders, etc.) and actually also is the enterprise standard. The integrated control system of the enterprise allows to supervise over the expanded value chain, i.e. not only internal resources of the enterprise, but also external (for example, customers of customers, suppliers of suppliers). The purpose of ICSE design is

management of a full cycle of production output - from designing to guarantee service after sale. Today there is a considerable interest from the industrial enterprises to use ICSE. Let's define defects of this system. First, it requires highly-skilled personnel which today do not sufficiently in the domestic enterprises that result to insufficient understanding of essence of methodological approaches to management. As practice shows, often there are cases when ICSE isn't introduced up to the finish that is why does not provide efficiency, and will sometimes disorganize planning of industrial and customs-marketing activity. Secondly, it is necessary to notice very high cost ICSE that for the enterprise means high risks of expenses which cannot repay. Thirdly, as well as the model IMS, this system cannot quickly react to not expected changes of the external economic environment as also is more mechanistic, than adaptive, constructed on the direct control and standards.

Thus, it is possible to do a conclusion, that the term "the integrated management system" - is not so much definition of type of a management system, how many characterizes level of flexibility of a management system. Elements of this system are ability to reformatting depending on changes of the external and internal economic environment for the purpose of fast reaction to these changes and obtaining at the expense of it certain competitive advantages. In our opinion, the integrated management system is such system which can not only quickly adapt for environment changes, but also be integrated so that to receive synergetic effect.

3. Models of the integrated management systems

The most widespread conceptual model of the integrated management system of the enterprise is the balanced system of indicators - Balanced Scorecard (BSC). Developed in the beginning of 90th by R. Kaplan and D. Norton (1996), this concept of enterprise management remains actual, both for theoretical researches, and for practical use. Inherently balanced system of indicators BSC - is the tool for realization of strategy of the enterprise, strategy transformation in operation and reflection of the received results in reporting system. At use of traditional management systems methods of an estimation of an overall performance of the enterprise and its competitiveness were reduced, as a rule, to financial indicators - to overturn, profit, increasing of funds cost, etc. R. Kaplan and D. Norton alongside with existing indicators have entered new indicators: a) development of relations

with clients; b) target training and personnel development; c) effective creation of business processes; d) increasing of trust of investors. The balanced system of indicators allows the enterprise to orient and to concentrate the administration, business units, the personnel, financial resources and information technologies on achievement of strategic targets.

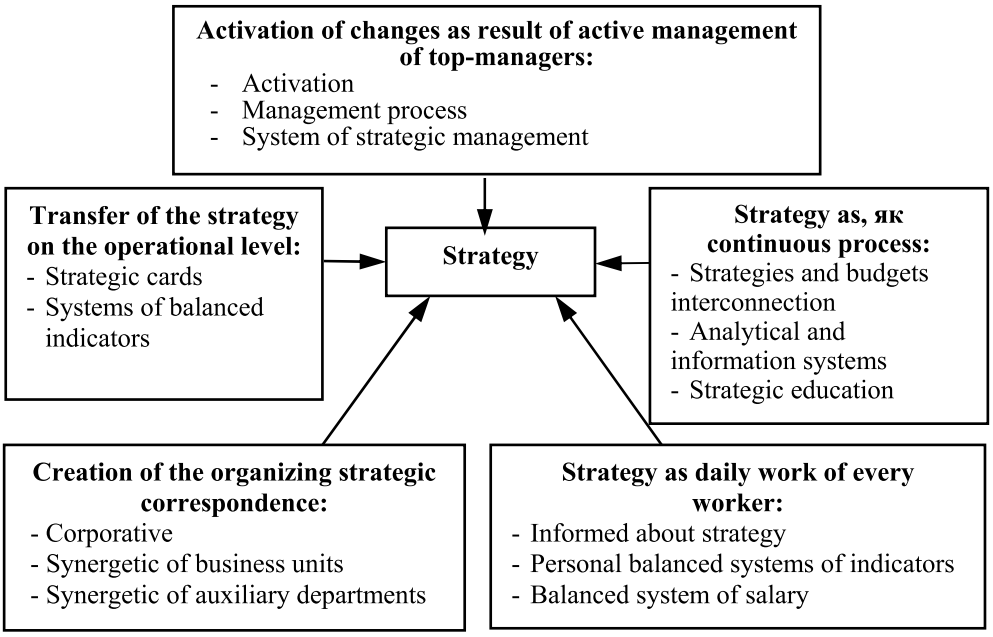
Three components are based of BSC:

1. Strategy - in conditions when each worker of the enterprise understands its necessity and effectiveness.

2. Reference points - accurately registered business processes which define the optimal way of achievement of strategic targets.

3. The organization - logic and architecture of connections between business structures, subdivisions, and employees.

Each enterprise defines its own approach to the decision of the strategic problems, but R. Norton and D. Kaplan (1996) have allocated some general tendencies which have the name "five principles of strategically focused organization", being schematically presented in fig. 1.

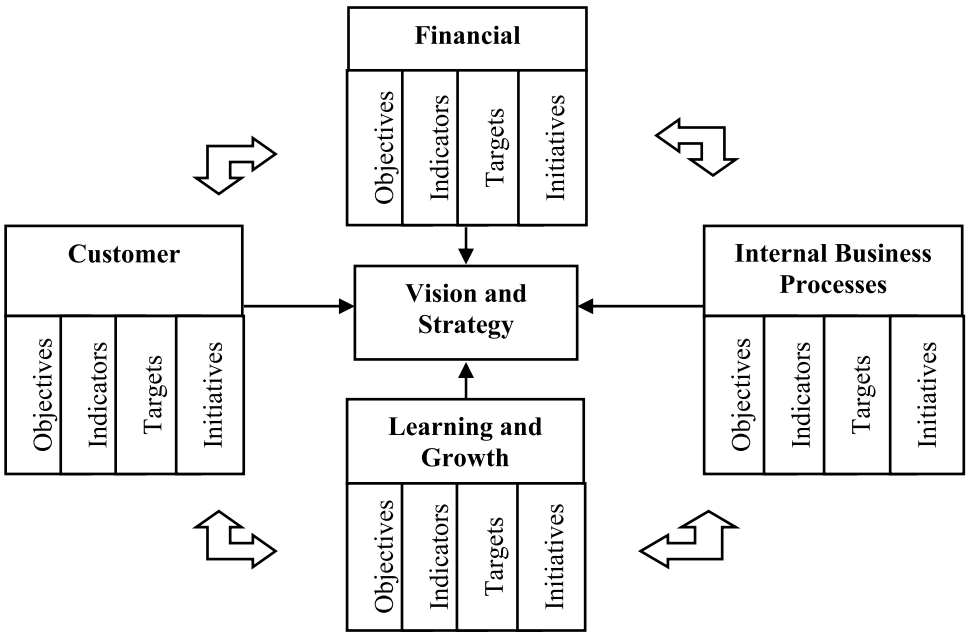


Source: Kaplan, R., Norton, D., 1996

Fig. 1. Principles of the organization focused on strategy

In practice there are many forms of using the balanced system of indicators for transformation of enterprise strategy to the concrete actions. But at all differences they can be united in the general structure (fig. 2) whose elements have the following properties (Kaplan, R, Norton, D, 1996):

1. A formulation of the main strategic target (vision).
2. A formulation sub-objectives as specification of an overall objective which are created on the basis of the strategic reference points directed on clients, internal business processes, and development of personnel, the finance and controlling.
3. Determination of indicators, as measuring parameters of achievement of an overall objective and corresponding sub-objectives.
4. Determination of the actions (targets) necessary for achievement of the purposes, design of a plan of arrangements, the working process organization.
5. Integration of indicators of enterprise activity into uniform system of the reporting.



Source: Kaplan, R., Norton, D., 1996

Fig. 2. System of the balanced indicators

Thus, the balanced system of indicators does not only set financial and not financial indicators, but also a logic and all-round way of definition of strategy of the enterprise, a reliable basis for designing a management system for the purpose of creation of the organization focused on achievement of strategic objectives.

4. Practical application of the balanced system of indicators

As the practice shows, the balanced system of indicators is a real, constantly operating tool in which the basis is the consecutive principle "Purpose - Action - Indicator". The methods of practical application the BSC model were developed by Friedag H. and Schmidt W. (2003). The successful introduction of model BSC requires the development of such flexible elements, as competence, a habit, a management style, corporate culture. These elements of system help to change rigid vertical hierarchical structures of the organization and to create flexible horizontal organic structures.

In our opinion, the enterprises in the conditions of unstable economic environment should not refuse application of the balanced system of indicators, as effective tool of increase of an overall performance of the enterprise and increase of its competitiveness. For practical design of the balanced system of indicators of the enterprise the scheme which is presented on fig. 3 is offered.

For an estimation of the contribution of each subdivision into the total result, for working out of effective system of stimulation of the personnel it is necessary to establish standard values of indicators. Value of indicators is recommended to be developed taking into account market indicators, researches of indicators of competitors and possibilities of the enterprise on the basis of SWOT-analysis.

There are different points of view on the structure of indicators. Gershun A. and Nefedjeva U. in their work (Гершун, А., Нефедьева, Ю., 2007) notice that it is needed to distinguish parameters which, on the one hand, measure the reached results, and from another - display processes which allow obtaining these results. Both categories of indicators should be connected among themselves, as for the achievement of the first (for example, a performance level) it is necessary to realize the second (for example to reach certain congestion of capacities of tools and the equipment).

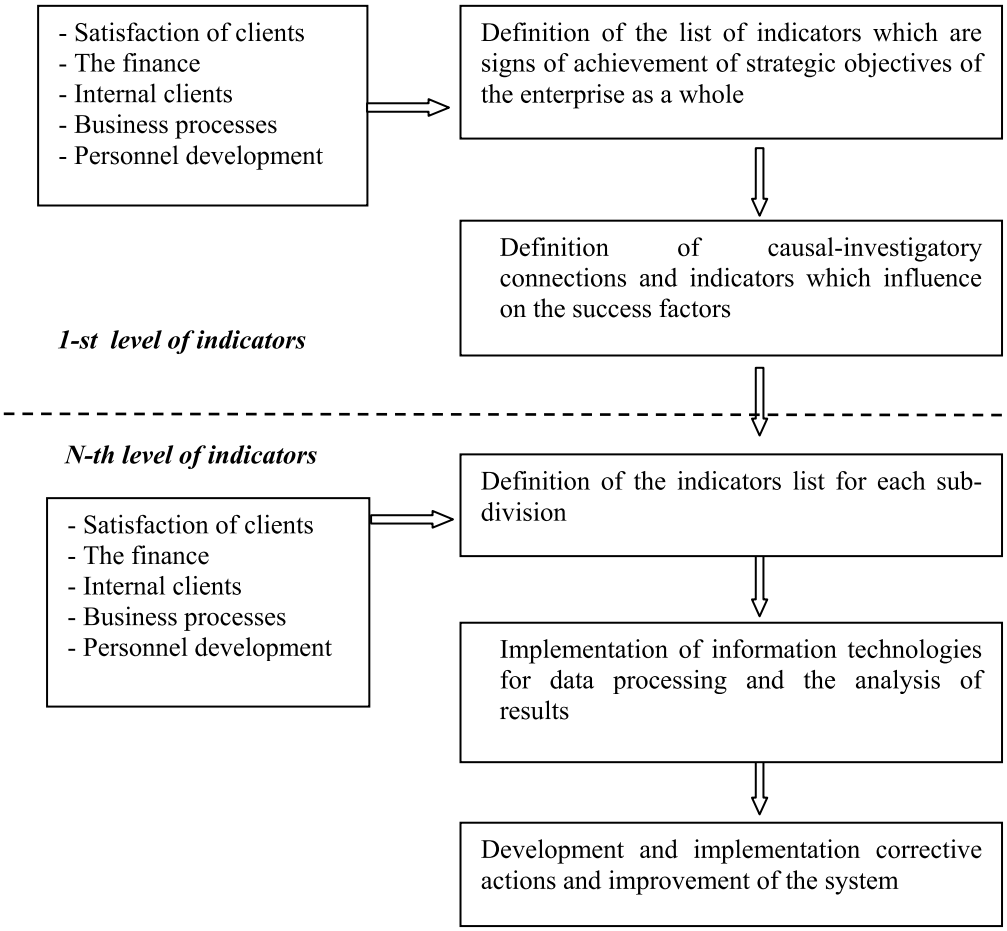


Fig. 3. The scheme of working out of the balanced system of indicators

The enterprise should define the register of indicators, some kind of the directory of which list those indicators which are keys for realization of the selected strategy get out and display enterprise processes. The rough list of indicators for each component of the balanced system of indicators is resulted in tab. 1.

Table 1

The rough list of indicators of the balanced system

Components BSC	Key indicators
FINANCES	Indicators of Profit
	Indicators of Profitability of Financial and Economic Activity
	Return on Investment (ROI), Return on Equity (ROE)
	Liquidity indicators
	Indicators of Business Activity
	Indicators of Capital Structure, Financial Stability of enterprise
	Indicators of Market Value of enterprise
	Others …
CUSTOMERS	Share of the market
	Increase in selling by …
	The term necessary for working out and start in production of new products
	Timeliness of production delivery
	Term of purchase order execution
	Rate of defects (%)
	Quantity of foods return
	Velocity of customer services
	Others …
BUSIN ESS PROCE -SSES	Efficiency indicators of the 1st key process
	Efficiency indicators of the 2nd key process
	Efficiency indicators of the Nth key process
DEVELOPMENT OF PERSONNEL	Terms of vacancies filling
	The cost for training in accounts on one worker
	Estimation of the competence and individual plans for development
	Availability of a personnel reserve
	Innovation proposals (number for the period)
	Discipline (absence from work, days of sickness for period)
	Average standing in enterprise
	Indicator of personnel fluctuation for period
	Satisfaction degree of personnel
	Turnover rate of employee
	Average salary
	Others …

Application of the following technique is offered at definition of key indicators:

- The quantity and kinds of indicators on each subsystem of the balanced indicators can be unlimited and are defined by the enterprise independently or by consultants;
- The quantity of indicators levels (fig. 3) also is defined by the enterprise independently or by consultants;
- Indicators should be reducing to a generalizing indicator as they have the various natures from cost to measurement physical quantities;
- Indicators are defined in the set range of significances (from minimum to maximum values);
- At definition of significance of an indicator the weight factor is applied;
- Certain indicators should be graded as reduction of their influence by achievement of the purposes and enterprise problems.

Table 2

Example of ranging of the enterprise indicators of the 1st level

Compo-nents BSC	**Key indicators**	**Weight factor**	**Value (points 1-5)**		**Weight estimation**	
			min	**max**		
Finances	Net profit	0,6	4	5	2,4	3,0
	Accounts receivable	0,4	3	4	1,2	1,6
	Total I_F	***1***			***3,6***	***4,6***
Clients	Sales volume	0,25	4	5	1	1,25
	Sales volume by dialers	0,25	4	5	1	1,25
	Share of clients which has addressed again	0,2	3	4	0,6	0,8
	Timeliness of production delivery	0,15	4	5	0,6	0,75
	Rate of defects (%)	0,15	2	3	0,3	0,45
	Total I_C	***1***			***3,5***	***4,5***
Business Processes	Efficiency indicators of the sales process	0,4	4	5	1,6	2,0
	Efficiency indicators of the logistic process	0,3	4	5	1,2	1,5
	Efficiency indicators of the marketing process	0.3	4	5	1,2	1,5
	Total I_{BP}	***1***			***4,0***	***5.0***

Compo-nents BSC	Key indicators	Weight factor	Value (points 1-5)		Weight estimation	
			min	max		
Develop-ment of Personnel	The cost for training in accounts on one worker	0,3	4	5	1,2	1,5
	Estimation of the competence and individual plans for development	0,3	4	5	1,2	1,5
	Availability of a personnel reserve	0,25	3	4	0,75	1,0
	Satisfaction degree of personnel	0,15	2	3	0,3	0,45
	Всего I_P	***1***			***3,45***	***4,45***

For definition of a complex integrated estimation of the balanced system of indicators of the enterprise we use the factor analysis method:

$$I_{COMPL} = \alpha \sum_{i=1}^{n} I_{Fi} + \beta \sum_{i=1}^{n} I_{Ci} + \delta \sum_{i=1}^{n} I_{BPi} + \gamma \sum_{i=1}^{n} I_{Pi}$$

where: I_{COMPL} – complex integrated performance evaluation of indicators of all levels of the balanced system of the enterprise;

i – number of the indicators levels;

$\alpha, \beta, \delta, \gamma$ - weight factors for each group of indicators;

I_F – integrated indicator in group "Finances";

I_C – integrated indicator in group "Clients";

I_{BP} – integrated indicator in group "Business Processes";

I_P – integrated indicator in group "Personnel".

On the basis of the received data it is possible to create some conclusions on degree of achievement of the purposes and enterprise problems. The administration of enterprise receives the instrument of an estimation of activity both all enterprise as a whole, and its separate sub-divisions on the basis of five marks indicators which characterize each group separately.

5. Conclusions

1. On the basis of the analysis of the existing management systems of the enterprise it is shown that at the expense of the introduction of the

integrated management systems, which are directed not only on material and financial resources but on non-material resources (qualification of staff, a request of clients, corporate culture, etc.) that allows to pass from rigid vertical hierarchical management structures to more flexible horizontal structures, it is possible to reach essential increase of competitiveness of the enterprise and efficiency of its work in the conditions of constant changes of external economic environment.

2. From the results of research it is possible to draw a conclusion: for increasing the efficiency of functioning of management system of an industrial enterprise it is necessary to conduct a number of actions for changing the principles and management methods which are directed on adaptation and integration of components of the balanced system of indicators of the enterprise's activity: strategy, finances, clients, business processes and staff which underlie the management integrated systems.

3. The basic indicators of activity of the machine-building enterprise which should be used in integrated management systems are considered and it is offered to define criterion of an overall performance of the enterprise on the basis of factor analysis.

4. On the base of an integrated management system the consecutive principle "Purpose - Action - Indicator" is used. The research presented in this article looks at the basic concern of such functions of management as "planning" and "control" of management systems, and display such elements as "Purposes" and "Indicators".

References

1. Лапидус, В., (2002), *Всеобщее качество (TQM) в российских компаниях*, Новости, Москва
2. Гершун, А., Нефедьева, Ю, (2007), *Разработка сбалансированной системы показателей: практическое руководство*, Олимп-Бизнес, Москва
3. Friedag, H, Schmidt, W., (2003), Balanced Scorecard at work, Haufe Verlag, Freiburg
4. Kaplan, R, Norton, D, (1996), *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, Mass
5. Mintzberg, H., (1983), *Structure in fives: Designing effective organization*, Prentice-Hall, Englewood Cliffs
6. Porter, M., (1998), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Free Press, Boston