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Design approach in management toward to business excellence

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ABSTRACT

Purpose: The main aim of this paper is to elaborate using design approach to building Integrated Management Systems (IMS) of organization to trace their own and dependable way to business excellence.
Design/methodology/approach: The basic theories used to achieve the aim are: system engineering and architecting, system integration by managing of the interactions among its elements and the social model of management. The theoretical scope of this paper is to find appropriate model of integration based on main principles of mentioned modern management disciplines.
Findings: At the beginning of design process of IMS lays Quality Management System (QMS) structured in accordance with ISO 9000 which allows organizations to use recognizable management practice and select properly quality tools for improvement of their core business processes.
Research limitations/implications: There are different ways and concepts of integration on the road to business excellence. Design approach enables organizations to find their own road to improvement of business performances by selecting properly tools and methods.
Practical implications: As outcome, the authors recommend the graphical presented concept to organizations that have the ambition to join the path of business excellence.
Originality/value: Results of this paper are intended for designers of management systems. Presented model sets framework of methodology for design process of IMS which is mainly new for managers.
Keywords: Industrial management and organisation; Quality management; Integrated management system; Business excellence

1. Introduction

The growing globalization and the increasingly complex business environment are conditions to which more and more organizations cannot adapt. The problem does not lie in the lack of competent resources, but in the inability to understand changes and in insufficient application of adequate management tools.

We can easily recognize trend in world today - development of specific management systems supported by standards as: ISO 9001:2000 (QMS), ISO 14001 (EMS), BS 8800/OHSAS 18001 (OHSMS), IEC 60300 (D), BS 7799:2002/ISO/ IEC 17799 (IS), SA 8000. Besides these systems, inside organizations also exists informal (non-standardized) systems as: finances, human resources, customers, IT, accounting, development, logistics, marketing, etc. Proceeding from these two viewpoints, integrated

management system of organization represents united management model which includes both general management models (non-standardized management systems) and formalized (standardized) management systems.

In this new time management ceases to be a skill and more and more becomes a science expressed in selection and application of available and adequate management tools. The basic direction in selecting these management tools is to establish an organizational structure, which is not supposed to be some non-integrated function and a task for which the responsibility is upon individual managers with partial goals. The organization must be an integrated system where managers harmonize relations among partial elements and integrate the strength of individual goals in creating future.

In order to understand integrated management System as a new concept in management theory and practice, it is useful to consider comprehensive examination various concepts and trends in literature presented by B. Dale [1]. The results of the above examination are summarized into four areas of interest:

- Integration in organizational behaviour, where integration is considered as the degree of coordination and cooperation needed to overcome differentiation (differences in structures, goals and attitudes) and establish a common outlook.
- Integration in systems concept where integration and alignment increase efficiency and effectiveness. In an integrated system, subsystems lose their independence. The concept does not mention culture
- Integration in quality management which is associated with deployment and refers to the degree of alignment and harmonization with the European Model for TQM, levels of TQM activity stages of quality culture.
- Integration in management system standards is associated with alignment, harmonization and compatibility and implies a single top-level system. The standards do not mention culture.

2.Effectivity & efficiency of IMS

Probably the clearest illustrations of effectivity and efficiency is given by P. Drucker:

Effectivity: DO RIGHT THINGS

Efficiency: DO THINGS RIGHT

In the scope of the integrated management system, "right things" are part of strategic and operational goals of organization, defined through ambitions of management to achieve the satisfaction of shareholder's interests or demands on the highest possible level (definition of quality). In management theory, procedure of defining goals is well known through defining of mission, vision, business strategies and policies, and their speeding through organizational structure. In today's dynamic and fast-changing environment, both economic and non-profit organizations can successfully achieve projected goals only by defining right strategies and policies on time, and by finding ways for their successful implementation. It is also of great importance to provide continuous control of correlation between defined goals and values of characteristics or economic indicators, which need to be subject of constant monitoring and supervision in suitable information system of organization. Balanced Scorecard (BSC) [2] is method which successfully solves this issue and is very popular because it is practical, rational and lucrative. BSC monitors optimal number of key characteristics whose selection originates from vision and strategy of organization.

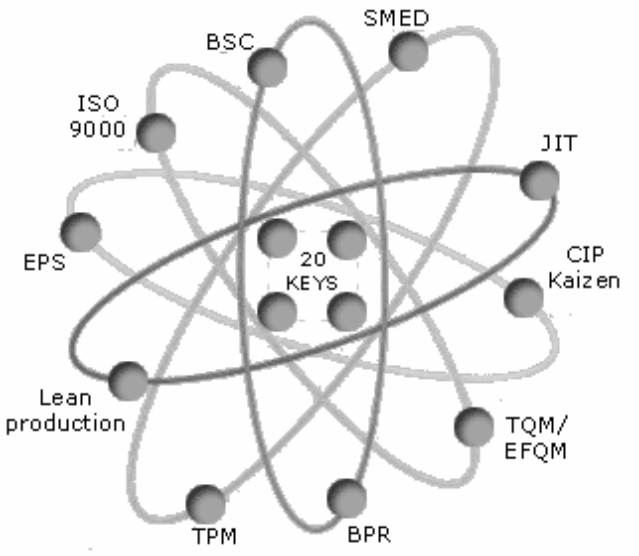

Fig. 1. Theoretical jungle in management theory

Management techniques, as mentioned BSC and many others, provide help for organization's management to make decisions in different situations, with lower risk level for achieving projected goals. Today we are faced to explosion of new management techniques and methods (for "to do things right«) which should contribute to management effectivity and efficiency, but it seems that this complex variety used in real-life situation leads management in "theoretical jungle". Managers who should effectively lead organization towards planed goals by every-day decision making and practical business actions, get easily lost in this jungle. Although there are many efforts in this area for systematization and making order (Fig. 1) [3], still it has not been defined consistent management theory which would point to determined directions and solutions in practice. On the contrary, modern management theoretician do not recommend using prescriptions and predefined solutions, but development of own, specific management model which corresponds in best way to cultural aspects of organization and environment. Only this kind of approach enables achieving appropriate level of effectivity and efficiency of management system.

For these reasons, in modern management theory designing procedure based on projects has been affirmed more and more. Application of such procedure in practice affirms role of management system designer (or management system organizer), a person who adopted different theoretical bases through his

educational process, who has required practical experience and who is qualified for using relevant project-managing tools with corresponding knowledge in IT.

3. Design approach of IMS

Contemporary publications on organization and management theory emphasise the role of design approach to management systems, as it is common in technical systems [4]. It is considered that the best way to learn a system is to design it. "The design methodology requires that designers learn how to use what they already know, learn how to realize what they do not know, and learn how to learn what they need to know. Finally, producing a design requires an awareness of how activities of one part of a system affect and are affected by other parts. This awareness requires understanding the nature of interactions among the parts" [5]. Within this we can at least identify parameters like: system and environment components, input-output vectors, objective function, system translation operator (process model), characteristics, and state vectors. The definition of these parameters and adequate design procedure enable sufficient data quantity for physical system realization and operation throughout its life cycle.

3.1. System thinking

Specially interesting part of designing approach are procedures of measurement, analysis and improvement of system performances, which are of great importance for complete knowledge about system, appropriate planning and designing, and finally for accurate statements about system's effectivity and efficiency. An independent set of variables is, therefore, a special case of a more general scheme of interdependency. As systems become more and more sophisticated, the reality of interdependency becomes more and more pronounced.

Understanding interdependency requires a way of thinking different from analysis; it requires systems thinking. Analysis is a three-step thought process. First, it takes apart that which it seeks to understand. Then it attempts to explain the behaviour of the parts taken separately. Finally, it tries to aggregate understanding of the parts into an explanation of the whole. Systems thinking use a different process. It puts the system in the context of the lager environment of which it is a part and studies the role it plays in the larger whole.

The analytical approach has remained essentially intact for nearly four hundred years, but system thinking has already gone through three distinct generations of change. The first generation of systems thinking (operations research) dealt with the challenge of interdependency in the context of mechanical (deterministic) systems. The second generation of systems thinking (cybernetics and open systems) dealt with the dual challenges of interdependency and self-organization (neg-entropy) in the context of living systems. The third generation of system thinking (design) responds to the triple challenge of interdependency, self-organization, and choice in the context if socio cultural systems.

The systems Theories of Russell Ackoff [6], note three basic statements that apply to all kinds of systems including socio cultural systems.

I. Three kinds of variables define any system.

These variables are:

- The system's functions in some larger system-that is, the role the system plays in a larger environment,
- The system's structure – its elements and how they are put together,
- The processes that take place within it – what happens to and among the elements when the system operates?

II. Every system has properties that its parts don't possess individually.

The properties of any system can be divided into two categories. One type pf property (Type 1 property) can be deduced directly from the properties of the elements. A Type 1 property of a car is its weight. A Type 1 property of a restaurant is the number of square feet it occupies. You can measure a Type 1 property in a straightforward way.

The other type of property is a Type 2 property. It can't be deduced in any simple way from the elements. In addition to such properties as «smooth ride» in cars and «good service» in restaurants, examples of properties of the whole include intelligence in human beings, performance of an electric motor, love in a human relationship, and beauty in a work of art.

Many Type 2 properties can't be measured directly, and none can be measured by simply looking at the elements of the system. How can you tell whether a restaurant has «good service», a school district has «collegial atmosphere», or a couple is «in love»? Any simple measure will mislead you. To gauge Type 2 properties such as intelligence or performance, we often have to examine some Type 1 properties that the type 2 properties have created. We judge the performance of a motor by measuring speed, torque, and so on. We might even evaluate whether a husband loves his wife by noting how often he mentioned her, how frequently he manages to meet her for dinner, and other such evidence.

The type 2 properties of a system often matter far more to people than the Type 1 properties.

III. Interactions among the elements produce the type 2 properties in all systems.

Therefore, managing interactions is always a central task for people in charge of systems. Interactions in any system create something new and important, and sometimes something quite unexpected. Whether you're an engineer working on the design of a new light switch or the CEO of a Fortune 500 company, you'll do best if you focus on the interactions of the elements in your system al least as much as on the elements themselves.

Artists and designers, who create systems of in animate objects, are almost universally taught the importance of focusing on interactions. Artists seek out high-quality materials, and the designers of automobiles choose excellent suppliers of components. Both recognize that the quality of their final products

depends as much on complex, subtle relationships among the components as on the quality of the components themselves.

But somehow, many of the most influential management thinkers have failed to recognize the centrality of managing interactions. Until recently, many how-to books for managers (even managers of schools) would prescribe simple, hierarchical structures to link the elements in organizations. When they discussed improvement, they would recommend sending employees to courses where they would learn new techniques in isolation form their fellow employees. They didn't encourage leaders to create and manage the same kinds of complex, subtle interactions among the elements of organizations that teachers of art and design regularly promoted in the creation of works of art or well-engineered machines.

A fundamental element of Ackoff's social systems model thinking is an emphasis on managing interactions of people in organizations.

3.2. Breakthrough

Established management model create conditions for performing strong breaks or revolutionary changes in improving organization efficiency. This occurrence is called "breakthrough" in the new management theory, and by author's opinion it represents the most important concept that new age managers should correctly understand, especially in economic systems with intensive changes (transition).

Differently form Deming's approach of continual improvement (PDCA); breakthrough presents a concept of rapid improvement of organizational performances. The beginning of a breakthrough process is an agreement inside the whole organization about a need for radical change, which usually comes out of critical situations. Than, the procedure continues in phases:

1. Abandoning of existing scientific practice,
2. Socialization of creative chaos in order to force mobilization in organization,
3. Creating of new (external) mental model which will stimulate and implicate mobilization,
4. Application of scientific methods and tools of management in order to implement changes.

There are different approaches in breakthrough process realization, depending on situation the company is in, so that basically some specific application formula does not exist. E.g. Russel Ackoff thinks it is unnecessary to research exact models and rules for management system establishment, and it is more useful to present "instruction book" than "rule book".

3.3. Scientific approach to management

Systems can not be improved by some recipes or in advance issued techniques, but by processes of iterative researches, measurements and regulatory – corrective activities. These are typical management processes and growing number of authors agree about their scientific core. Wide range of tools has been developed, which managers and planners efficiently use in these processes. In such way "management as skill" loses its competitive power when it comes to "management as knowledge".

However, incompetent application of management tools and techniques usually result in reduced effects, and often leads to counterproductive effects. Namely, it become common those managers, scientists, planners and consultants see management methods as mutually exclusive, and tend to use those methods which they are more familiar with. E.g. some market research methods are used independently from the product development methods and production methods. Good management methods should not be mutually competitive, but should integrate organization functioning. It is not a rare example that a new manager changes methods that his predecessor used to apply, only to leave a personal impression in the organization. Similar situation is in the scientific public, where it is common that some "new great idea" replace "old great idea" (CIM, JUST IN TIME, TQM, LEAN PRODUCTION,).

So, to solve these disagreements, it is the best to apply scientific management approach, which can be implemented, by analogy to scientific work principles, in phases:

1. Measuring and researching of existing state of all important system features,
2. Analysis and identification of factors that influence negative trends,
3. Setting of hypothesis and selection of methods which could get better trends,
4. Hypothesis testing through experimental application of new methods,
5. Method validation, modifying or confirming of hypothesis and new method implementation.

3.4. Synergetic effect of collective work and leadership

Significance of synergetic effect of collective work is by itself understandable, and there is no need for a detail explanation. Finally, powerful informational and communicational technologies are developed in these fields which give to e.g. project management field completely different dimension. This approach strongly corresponds to team work principles and effects in process of group opinion evaluation, which are unavoidable in modern management theory.

In achieving synergetic effect, the main role seems to be in selecting and implementing of management methods that are immanent to social model. Social model of management appeared in 1980 -s in the last century, and it is more and more in use.

By this management model, organization is considered as associated group of people who work together on achieving individual and common goals [6].

In traditional management the commonly used tools are: strategic planning, costs management functional organizational structure, detailed description of work tasks, standard work procedures, division of work between performers and promoters, management by objectives, financial measuring and others. However today, fast-changing information era requires the level of organization intelligence form of reacting which can be found only in the social model of management.

According to the social model of management, the leader has a task to manage goals, structure and processes in organization, so that everyone can independently use intelligence in improving organizational performances in harmony with wishes of all interested stakeholders and society in general. Leaders coordinate and harmonize goals and create structure and processes.

4. IMS contribution to management excellence

The application of suitable concepts of management systems integration as well as the application of specific management tools contributes to the continual improvement of efficiency and effectiveness of business processes in an organization. These improvements, combined with the reengineering projects, conclusively lead to continual growth of the organization as a whole in several different aspects. Several different performance-measuring systems are implemented to evaluate this growth, in which different concepts of integrated management can be recognized.

Even a superficial insight into the structure of the EFQM-model for evaluation of the efficiency and the effectiveness of the organization points out the integration of all standard management aspects: ISO 9000 (leadership, policy and strategy, processes, partnership and resources, customers), ISO 14000 (processes, society), ISO 18000 (processes, employees), SA 8000 (employees, society). The model also integrates the evaluation of other management aspects (operation parameters) that are important to the organization. For the organizations that have the ambition to strive for and, at a later point, to join the "society of excellence", this is a clear sign to implement the integrative concept into their management strategies. In other words, it is necessary to implement and program the concept of an Integrated Management System (IMS) project in the process of establishing the quality management system (QMS) [7-9].

Starting point, as effective tool, for establishing ground and satisfaction of requirements for planning, development and implementation of integrated management model is multilevel model of (strategic) goals, vision, mission and organizational processes. Deployment of goals in this model is done:

- by horizontal levels (standardized/non-standardized management systems), and
- by vertical levels (from top management to each employee). This means that structured multilevel model of organizational goals represents base metrics for application and implementation of integrated management system.

Theory and practice of IMS application defines following stages in development and implementation of these systems:

- unique policy defining for quality, ecology, safety and security of employees. From organization strategy, vision and mission as one angle, and from requests of these models as another angle, integrated policy is being defined. Policy represents framework for application of these systems and base for defining goals which are achieved through this application;
- planning of quality elements, ecology program, safety and security of employees, as well as planning of common and partial MS goals, represents elements in stage 2. These plans represent framework for implementation of these systems in practice;
- next (third) phase is implementation of integrated management system project. This project is being done according to standard ISO 10006, and includes: definition of model and documentation, their mutual connecting, documentation management, management with processes and employees training;
- fourth stage includes checking, confirmation and corrective actions related to integrated management system, and consists of : checking processes and equipment, monitoring and measurement, non-harmonized elements, corrective/preventive actions, notes/documents and integrated audit. Especially important aspect of this stage is development of integrated audit model for concrete organization, which has as result unique evaluation model;
- next to last stage is re-confirmation of integrated management system. Today, by standard is defined model ISO 19011, which includes QMS and EMS. Other elements have not been united so far, what we can expect to happen in near future. But currently it is up to organization itself to develop integrated model for planning and performing of re-confirmation;
- continuous improvements in implemented model of integrated management system are the last stage in their application development. Following this path, by consequently applying analyzed stages, model of integrated management system is being implemented in organization [10].

5. Conclusions

After summing up all the considerations and experiences in processes of management systems integration, that have not referenced in this article, yet are accessible to the professional public through competent literature, the authors recommend the following concept to organizations that have the ambition to join the path of business excellence or that are already following it (see Fig. 2.):

A. Design and implement an Integrated Management System (IMS), which is able to satisfy the demands of different standards, above all of ISO 9000 and ISO 14000.
B. Establish a system for measuring the key indicators, which is able to display improvement in different fields of evaluation according to the EFQM-model. The BSC system is recommended.
C. Continually launch (at least once a year) and review the projects for improvement of the Management system, implementing corresponding management methods and techniques.

References

[1] B.G. Dale, Managing quality, 4-th ed., Blackwell Publishing Ltd, Oxford, 2003.
[2] R. Kaplan, D. Norton, Uravnoteženi sistem kazalnikov: The Balanced Scorecard, Gospodarski Vestnik, Ljubljana, 2000.

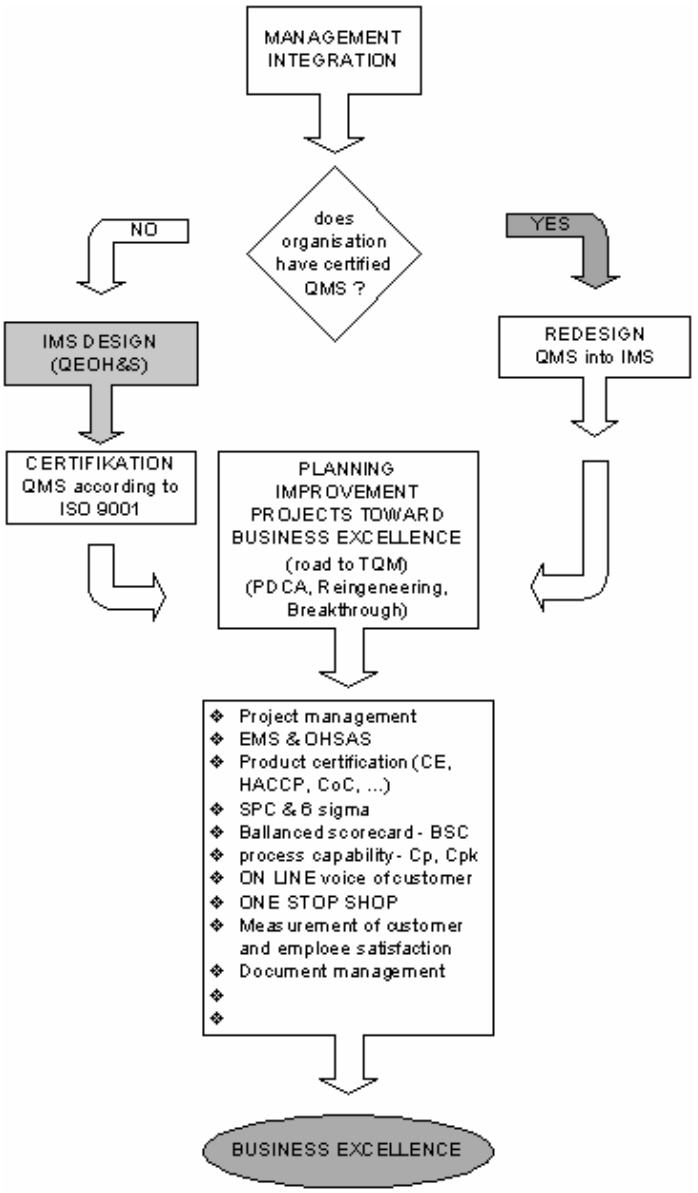

Fig. 2. Design approach to business excellence

[3] I. Kobayashi, 20 keys to workplace improvement, Productivity Press, Portland, USA, 1995.
[4] M.W. Maier, E. Rechtin, The art of systems architecting, CRC Press, 2002.
[5] J. Gharajedaghi, Systems thinking: Managing Chaos and Complexity, Butterworth-Heinemann, Boston, Oxford, 1999.
[6] T.H. Lee, S. Shiba, R.C. Wood, Integrated management systems – A Practical Approach to Transforming Organizations, John Wiley & Sons, Inc., New York, 1999.
[7] M. Bobrek, M. Sokovic, New tool for integrated management system design, Proceedings of the 12th Int. Scien. Conf. AMME'2003, Zakopane, Poland, December 07-10, 2003, pp. 103-106.
[8] M. Bobrek, M. Sokovic, Implementation of APQP concept in design of QMS, J. of Mater. Process. Techn., 162-163, (2005), 718-724.
[9] M. Bobrek, V. Majstorovic, M. Sokovic, Design approach in management toward to Business excellence, Proceedings of the 11th Int. Scien. Conf. CAM3S'2005, Zakopane, Poland, 6th-9th December, 2005, paper 1.104.
[10] V. Majstorovic, Strategije za integraciju standardizovanih menadžment sistema, Poslovna politika, Beograd, 2004.