

New Concept of the Management Based on New Tecnological Solutions and Knowledge Bases

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Abstract:

With all its strengths and weaknesses the business systems need to adapt to the changes in the environment and in the most appropriate way respond to the possible threats and take advantage of possible chances. Regardless of all the difficulties and the slow changes in the practice of management there are some specific technological changes that will have significant influence on the way of managing the business systems of the future. In this paper we propose one technological change which should have certain influence on the efficient management of the business systems with the use of the knowledge bases, ontologies, semantic web and new software solutions. Management as a scientific discipline has experienced certain changes: from traditional, classical, to the modern and postmodern. In this paper the authors have made a small cross section of this development to be able to extract the appropriate knowledge which they could be able to enter into the knowledge base. From the business systems as a closed system in which the efficiency and control are the basic principles to the business systems without paper, without people, with computer integrated manufacturing, it underwent a serious of changes. The most significant changes occur under the influence of information technology and networking. The authors of this paper suggest the original, different way of using information technology and new software tools for more efficient managerial decision-making with the use of knowledge bases.

Keywords: business systems, new management, knowledge bases, new software solutions.

I. INTRODUCTION

The characteristics of the 20th and the beginning of the 21st century are big economic and political transformations, which led to the greater integration of the world economy. It comes to the opening of markets in regions which were previously closed and it seeks of the business systems to adapt to the cultural standards of those countries with which they do business. Strong competition of the global market has led to the significant changes in the economic logic of the business system. In the traditional business model the capital was a scarce resource and the orientation of the business systems related to the more efficient transformation of inputs into outputs. Now the scarce resource is knowledge and the success of the business system does not depend of the efficiency but from the creativity and the innovation of the employees.

The new information and technological revolution and the emergence of the Internet have enabled the users the access to the enormous amount of data and information. It enabled joint work in virtual teams which was not possible ever before, leading to the possibility that the work is done anywhere and at any time. The conditions for the creation of the virtual office are provided, which is formed or turned off when needed.

Now the employees live and work longer but they are more loyal to their own professional identity than to the business system in which they work. The workers of knowledge appear where the engagement in work is strictly connected with the work they do rather than for the salary they receive. This led to a different relationship between management and the employees. Business systems are now faced with a serious crisis which is not only connected with the financial collapse in 2008. That crisis is even more dangerous because it refers to the fall of the key performance indicators of the business system such as the number of innovations, turnover rate, customers' satisfaction or users of services and the employees. The crisis in Bosnia and Herzegovina is not only caused by bad laws or economic policy but is also the consequence of the errors of management. A good portion of experts in this area argues that the management as a theory as well as the management as a practice has crashed.

In this paper, we give some recommendations to the managers that with the greater use of the new technological solutions based on knowledge bases and semantic web improve the efficiency of its work.

II. THE DEVELOPMENT OF MANAGEMENT

Management as a theory is based on the paradigm of the business system as a closed system in which the efficiency and control are the basic principles has suffered the first blow already in its beginnings.

In 1924 Mary Parker Follett noticed three key characteristics of leadership in the future: leadership with the function of service, leadership of power and diversity and self-organized teams.

She has developed the theory of management that was contrary to the by then prevailing settings.

The researches of Elton Mayo and his team have put in question the validity of Taylor's mechanical approach to the human dimension of organization and they have secured a new and revolutionary approach to the problems of man at work. Their approach has nevertheless remained within the framework of the treatment of the business system as a closed system.

The first departures from the classic paradigm of management have been created in the late 60's when the environment is treated as a very important element of management. Such attitude has significantly contributed Lawrence and Lorsch, Jeffrey Pfeffer and Gerald Salancik, Marshall Meyer and others.

Peter Senge promotes the concept of learning organization describing the organization as an organism that is able to increase its abilities (its intellectual capital) and shape them for a new future. Michael Hammer and James Champy suggest that the business in the business systems is not organized around the tasks, but suggest that the job has to be organized around the process [1]. In this way, the traditional concept of hierarchical structure and functional conception of the structuring of the organization is crushed.

Peter Drucker in his book "Managing in the next society"(2002) indicates the changes that will occur and their consequences for business systems, its organization and management, particularly emphasizing the importance of good governance.

In his book "The Future of Management"(2007) Gary Hamel urges managers to abandon the existing managerial way of thinking and to accept and cultivate the practice of innovation. It is believed that the majority of management principles and systems based on unnecessary managerial paradigm and that management innovations are the main source of competitive advantages [2].

The management practice has developed, which has been dictated by the large business systems and which had become dominant with its model of management.

Taylor, Gilbreths and Ford were establishing formal structures and processes in the business systems and the hierarchical system of control that are recognized even today. That management model was designed for efficiency, low costs and standard products. Using this model, most business systems have achieved significant success in its history so that model has become one of the key factors of economic progress. However, this model was added negative attributes such as bureaucracy, hierarchy, control, formal procedures – that accompany it even today. This model has led to some problems such as [3]:

1. They do not recognized other, alternative management models such as those in sports teams, communities, voluntary organizations, families. These organizations operate on principles different from the principles on which operate large business systems.
2. Wrong conclusion that the large corporations are superior with their model to the other forms of organizations. It is certain that they existed and that there are industrial processes that are more appropriate for economy of scale, but it is certainly false if it is claimed that the mass production was the only feasible model for industrial business systems.

Seeking solutions for ensuring the process of management as a discipline must be based on the basics of functions – enabling instead of commanding. Answers to the next questions can certainly contribute to ensuring the progress of management. Can we improve the management so that it functions more efficiently and effectively in the economic development, to meet the needs of the employees? How to ensure teamwork for achievement of the desired tasks and goals?

It should be borne in mind that:

- Some opinions can hardly change,
- New practices are usually fragile,
- Business systems are more interested in the results than the improvement of practices
- In times of crisis it is difficult to introduce something new.

Because of the length of the paper, here we did not present a large number of significant solutions and proposals for more efficient business and more quality decision making.

III. MODERN MODELS OF MANAGEMENT

Management as well as other scientific disciplines has experienced various changes: from traditional, classical to modern and postmodern paradigm [4]. From the business system as a closed system in which efficiency and control are the basic principles to the company without paper, without people, with computer integrated manufacturing has experienced a series of changes.

The most significant changes occur under the influence of information technology and networking.

Some visions and some good ideas are not realized because the employees are the ones who give the business system flexibility and creativity.

Here we give in the shortest form some ideas which have influenced the development of the management. Some of these ideas are:

- Future business systems will have a fewer number of levels of management and it will be based on knowledge and self-direction [5],

- It will conduct a shift of focus from hierarchical to network organization [6],
- The bureaucratic hierarchical form of organization which is used by the largest number of business systems is worn out and it must be used a network model so that the business systems will be competitive [7].
- Japanese model of Holon, model of self-organization, the German model of fractal factory and an American model of agile manufacturing [8].
- Metaphors for organizing highly adaptive companies [9].
- Horizontal partition of enterprises into small autonomous entrepreneurial units [10].
- Intelligent organizations driven by changes [11].
- Intelligent organizations driven by intellectual capital and knowledge assets [12].
- Radical management [13].
- Injecting the sense of urgency [14].
- The introduction of new technological platforms [15].
- Reinventive management [16].
- Hierarchical and collective wisdom [17].

There are hundreds of management models, none of which is ideal although there may be considerable value in each of them.

IV. KNOWLEDGE BASED AND ONTOLOGIES [18]

Knowledge base should contribute to a better understanding of the strategic management, the nature of the strategy, the creation of successful strategies, environment in which operates a business system, selection and formulation of strategic options, implementation or strategic implementation and the system of strategic control.

The term ontology is very wide and represents more than a conceptual idea of strictly defined formalism for expressing knowledge. In its work Chi and Hsu[19] the approach to the development of ontology define as a process of inclusion and learning, its storage, finding and using.

Ontology describes a certain area through a given terminology (vocabulary area), basic concepts, classification of these concepts and connections with concepts while defining the rules that govern among them. This is a detailed description of the structure of an area of knowledge, with the formal definition of mutual relationships and connections between the different elements of that area [20]. It is used for knowledge representation, management and organization of knowledge, modeling and shaping of databases, search and download of the required knowledge.

“Ontology is a formal, explicit specification of common conceptualization” [21].

That is a set of terms and relations between them, which is described a certain domain or area of knowledge. The domain can be any subject area, regardless of its level of generality.

Here we can rightfully ask the question: Why develop ontology in the management system. In our case, we do it because of: a more efficient sharing of information and knowledge and better use and analysis of the domain of knowledge. The system based on ontology would provide: software agents to seize the necessary information and knowledge and to provide it to the managers for more efficient management of business system.

It must be known that there is no unique approach that recommends the right way (methodology) of ontology development.

We will use the iterative approach. We will mention the basic knowledge necessary to managers and then we will through certain revisions and improvements come to the basics for a new automated system. You need to think about more viable alternatives in order to ensure that ontology is extensible and that it provides necessary knowledge to managers.

A key role in the efficient management process represents knowledge of managers. When building a new system it can be seen three important factors related to knowledge, namely: knowledge acquisition, knowledge representation and the use of knowledge when needed.

In this paper I want to propose a part of the necessary knowledge needed for managers to effectively manage business systems in Bosnia and Herzegovina. Due to the limitations of this paper we highlight only to us the most important parts of necessary knowledge leading them only to grasp a new concept.

We now have a large number of languages and tools for describing ontologies. Among ontological languages in use is mostly OWL (Web Ontology Language) and editing tool for ontologies “Protégé-OWL“. OWL is a development environment presented by the World Wide Web Consortium (W3C).

Protégé is an open- source platform that allows users to: read and save OWL and RDF ontologies, updating and visualization of classes, defining the characteristics of logical classes, performance of causes and update. Its purpose is to allow users to display the meaning of terms and the relationships between those terms. It provides a rich set of structures for modelling and activities that support the creation, visualization and manipulation of ontologies represented in different formats. It was developed in the Stanford Research Center of Biomedical Informatics at the Faculty of Medicine at Stanford University in California[22].

Here we used the Protégé platform for reading and storing OWL and RDF ontology, for updating knowledge necessary for personnel management. Figure 1 is a simplified image of necessary knowledge and more detailed explanation are given below.

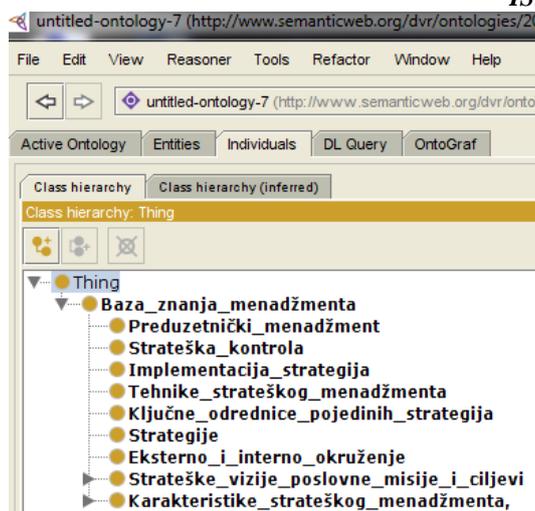


Figure 1. Necessary knowledge

The authors believe that the knowledge base of every manager should contain the following knowledge (Figure 1):

- Characteristics of strategic management, (Karakteristike strateškog menadžmenta),
- Strategic vision, business missions and objectives, (Strateške vizije, poslovne misije i ciljevi),
- The external and internal environment, (Eksterno i interno okruženje),
- Strategies, (Strategije),
- Key highlights of certain strategies, (Ključne odrednice pojedinih strategija),
- Techniques of strategic management, (Tehnike strateškog menadžmenta),
- Implementation of strategies, (Implementacije strategija),
- Strategic control, (Strateška kontrola),
- Enterprenurial characteristics, (Preduzetničke karakteristike).

In this paper we consider only: characteristics of strategic management and startegic visions, business missions and objectives. (karakteristike strateškog menadžmenta i strateške vizije, poslovne misije i ciljeve). With the use of Protégé-OWL software platform we performed the update of the knowledge base Figure 1.

In order to effectively form a knowledge base we adhere to the W3C recommendations for a formal description of concepts, terms and relationships in *Web Ontology Language (OWL)* .

V. CHARACTERISTICS OF STRATEGIC MANAGEMENT

Startegic marketing in its focus has interactive relations of business system, its strenght and weaknesses, the environment enabling it through a series of individual goals to reach and achieve the main goal: the achievement of lasting profitability. The basis of this concept is the integration of all resources in order to create strategic advantage.

In modern business conditions, business systems need to find the best road which means harmonizing the level of profitability, achievement of customer satisfaction or the service user, strenghtening the competitive position, the efficient use of resources and key elements of progress and accountability [23]. A good base of knowledge can certainly help them in that.

Working on the route business system-environment, strategic management its fast (flexible) reacting realizes through the following concepts (Figure 2): Multi-variety planning (Focus on its adaptive behaviour of the business system to new situations), Management of strategic issues (Identification of internal and external changes.Defining procedures to respond to these changes,...). Strategic management by weak signals (The evaluation signal which matures and strenghten,...).Management of suprises (The answer to the problem or question is usually urgent and failing to do so implies the loss of chance,...).

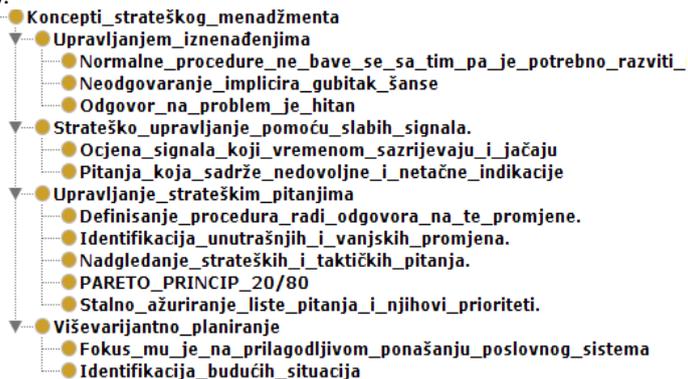


Figure 2. Concepts of the strategic management

Planning is consciously directing of activities. It is an integral part of the activities of every business system. A key feature of planning is its omnipresence and the plans provide control standards [24].

If they want to call their specific execution of activities planning then apart from the choice of the future situation, managers must share a common intention to carry out a series of activities, actions, which will reach to the chosen future state. Necessary knowledge in planning steps (Awareness of opportunities – external opportunities and threats, internal weaknesses and strenghts. Setting of goals – what we want to be, accomplish and when to do that. Identification of alternative: what are the most promising alternatives and similar). Types of plans, Long-term planning, Strategic planning and similar are given to the knowledge base Figure 3.



Figure 3. Effects, planning, characteristics

Establish a strategy (chose a suitable option of strategic action) means to think and to choose the way of meaningful action with clear answers to satisfy customers, capitalize on new opportunities in the best way, increase the business, reach the desired strategic and financial goals, to conquer the competition and to achieve competitive advantage, defend oneself of potential threats, respond to changes.

The strategy is a mix of planning, thoughtful and purposeful activity and required reaction of adapting to the unpredictable development and possible competitive pressure. What knowledge related to the strategy are necessary to the business system and the manager are given to the knowledge base Figure 4.

Only people who have enterpreneurial spirit and excellent knowledge of their profession can implement the necessary changes and to do and implement the strategy and effectively manage the business.

Entrepreneurs who are creative and innovative, that use new technologies, their capabilities of initiatives, who in the most optimal way manage people, financial and material resources, can ensure that the business system is efficient and competitive. They are always ready to modernize and restructure.

For entrepreneurs, acting strategically means to act on the changes and challenges of the environment, maintaing the freshness and timeliness and the sense of change, the best choice of alternatives with innovations and business creation [25].

Establishing a good strategy and its effective implementation is the essential function of management. They must make policy decisions and to think strategically and their task is to collect necessary knowledge, do the necessary analysis about the recent events and to make strategic decisions. What are the concepts and knowledge that are necessary for that are given in the Ontograf Figure 5.

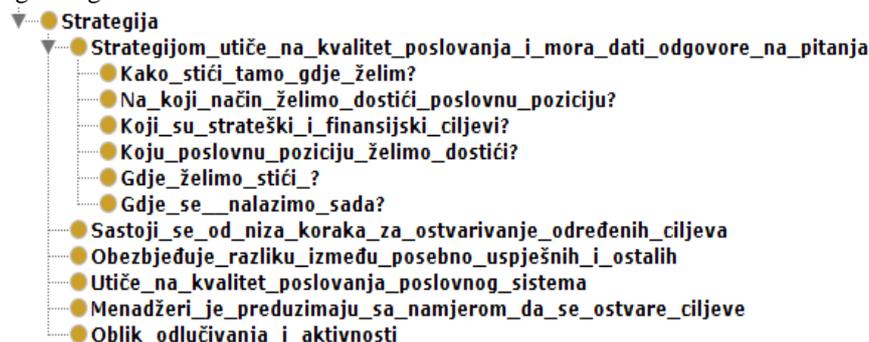


Figure 4. Strategy

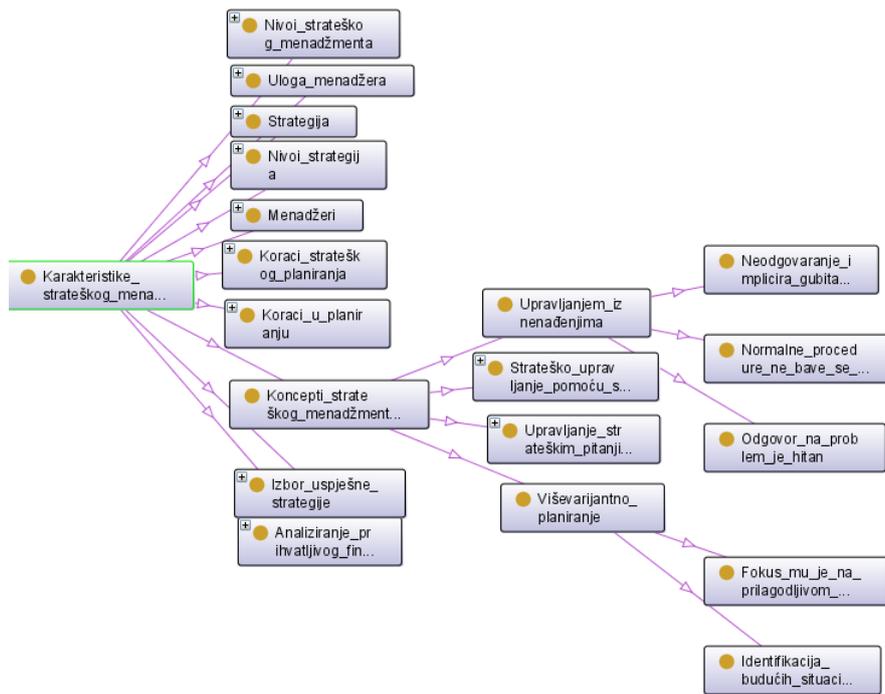


Figure 5. Management of surprises

Strategic management is oriented towards the environment and changes in it, preparing an adequate response to them. Their activities are focused on: establishing the correct relations of business system and its environment, determining the visions and objectives, strategic planning and the creation of strategic position and defining the future.

VI. VISION, MISSIONS AND OBJECTIVES OF BUSINESS SYSTEM

The mission of the business system refers to what it does. It is expressed in the form of the public statement, which stresses the meaning and the purpose for certain interest groups and gives a picture of the business system for customers or service users.

The vision of the business system represents what that business system could become if it successfully implemented its mission. It must be clearly stated the business orientations of the business system and the missions and its needs. It has to be known the reasons for the existence of the business system, its mission and vision especially for the shareholders, owners of shares but also the other interest groups. Necessary knowledge for the development of vision, mission and objectives are given in the knowledge base.

The mission has to be clear and concise and their basic components are: the buyers or users of services, products and / or services, markets, technologies,...

The necessary knowledge for determining the roles, limits, characteristics of the vision of the mission and objectives are represented in the knowledge base Figure 6.



Figure 6. Vision, mission, objectives

The vision should respond to a series of characteristic questions: what is the business of the business system now and what type we want to achieve, what are the desires of the customers/service users, what the environment expects, who are the competitors and what is their area, is there the expected impact of the technology on business and what are the scenarios in relation to the environment.

The way the business system is developed is the way how the vision is developed and nurtured and its realization is a lengthy and often painstaking work. Limitations of the vision can be: environmental pressures, difficulties, certain circumstances, the shortcomings of the viewpoint, current position.

The strategic objectives indicate the reasons for the existence of the company. They have a temporal quantification which brings a sense of urgency and acts as a motivational factor. With temporal quantification of objectives of when and how much is established a certain condition or situation that will be reached and towards which the attention and energy will be focused.

In achieving challenging but achievable goals it should be avoided complacency, acquiescence, internal confusion and the status quo of execution. Necessary knowledge for the presentation of visions and objectives can be seen on OntoGraf Figure 7.

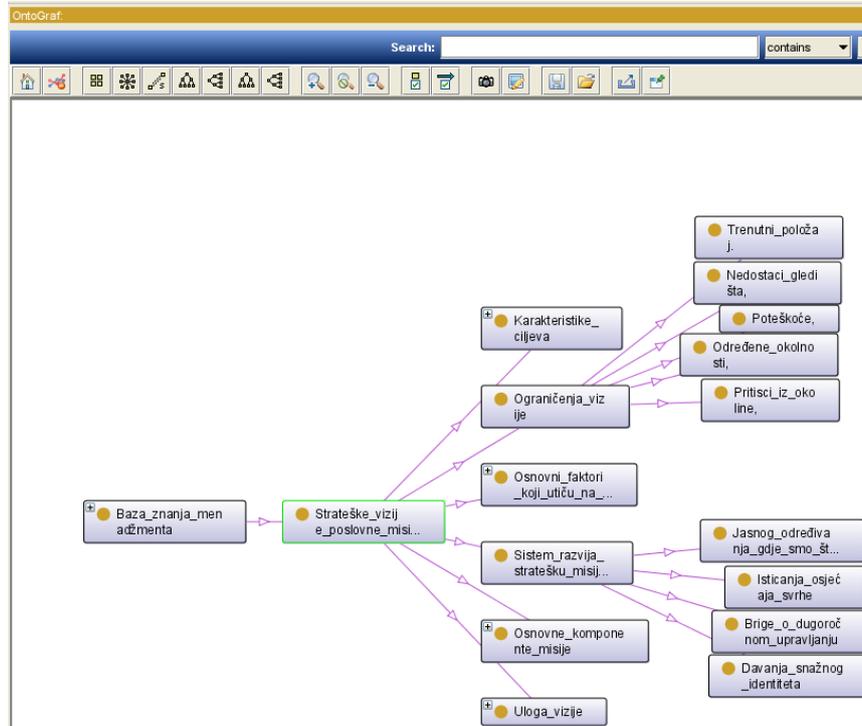


Figure 7. Strategic objectives and visions

The strategic objectives have a time dimension, so we distinguish long-term and short-term objectives. Short-term objectives focus the attention of the business system on the need that in the short term improve their performance and results. If the current activities are put in the function of the achieving of desired, certain condition or a situation which the business system aims to achieve, it will achieve its long term objectives.

VII. CONCLUSIONS

The changes occurring in the business systems and decision-making will be oriented on the new technological solutions and modernization which would establish some new principles and whose beginnings can be found in the practices of some business systems. It is necessary to know and question the longstanding managerial practices that have prevailed in the previous period on the one hand and the practice based on the new technological solutions of the advanced business systems of today, on the other hand. The authors in this paper have suggested the implementation of new practices based on knowledge bases.

Future managers will base their work on new models in whose base will be the following components:

- A shared vision and courageous mission,
- Insignificant hierarchy and a wide range of control,
- Small self-managed teams with interchangeable leadership,
- Freedom of opinion,
- A large number of economical experimentation,
- A dense network of communication,
- Rewarding the most successful with excellent ideas,
- Teamwork on product development,
- Customer and user in focus,
- Efficient use of new technological solutions based on the knowledge bases.

It should be borne in mind that the management is not at the end and that its future is yet to come but it should be properly set up, because they are going to perform less and less their classical function.

The development of new technological solutions and the level of education will lead that the difference between “manager“ and “worker“ decreases and that the knowledge management is going to be everyone's responsibility. Therefore, the task of every worker will be to learn and the role of the manager is to promote and channel that knowledge. Solving problems that appear in the business system, planning and making decisions will be a common area of all the employees.

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