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CONTENTS

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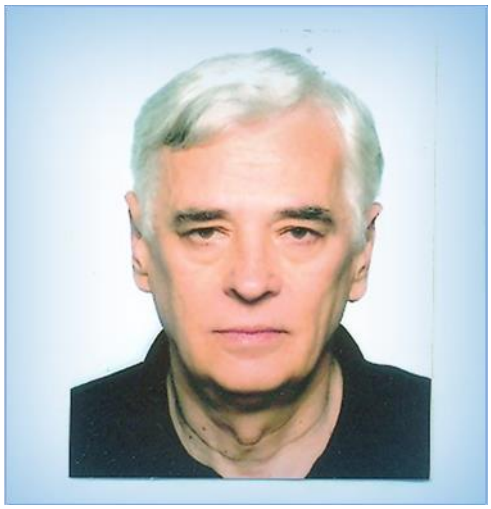

On the occasion of celebrating an important anniversary of the Serbian Project Management Association (YUPMA), its 25 years, we are proud to launch a Serbian Project Management Journal, a specialized journal that is to present the most recent knowledge in the fields of project management and other specialzed management disciplines.

The development of project managemnt in Serbia, since its beginnings in 1970s, to the establishment of the Project Management Association in the 1980s, until today, went through many a difficulty. Regardless of severe problems that this country and the Project Management Association encountered, project management gradually developed and was implemented in this country, and today it is evident that the implementation of project management is a sine qua non in almost all the areas of human life and work.

It is our genuine wish in launching this journal to contribute to the further project management development and implementation in Serbia.

Petar Jovanović

President of Serbian Project Management Association YUPMA

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BALANCING OPERATIONAL AND PROJECT ACTIVITIES OF ORGANISATIONS BASED ON THE IPMA ORGANISATIONAL COMPETENCE BASELINE MODEL

Sergey Bushuyev[1], Erik Mansson
[1]*Kyiv National University of Construction and Architecture KNUCA*

Note: This paper was presented during IPMA World Congress in Dubrovnik Croatia, October, 2013.

Abstact: The IPMA Organisational Competence Baseline (OCB) adds an exciting dimension to the world of projects, programmes & portfolios, the perspective of organisation competence in project management. It perceives projects as an integral part of an organisation. Thus, an organisation - as social system - needs to build up competences for managing the multitude of projects.
Balancing operational and project activities is one of the key issues of organisational competence development. The report presents an OCB reference model and a balancing method for the development of organisational competence, based on the authors' accumulated experiences.

Key words: Competence, Organisation, Reference model, Project activities, Operational activities

1. INTRODUCTION

Project management has developed considerably over the past decades. Today we have a much better understanding of how to manage projects, programmes and portfolios (PP&P) of projects and programmes, applying state-of-the-art methodology and competences. It is clear that successful PP&P management has to be more than a competent application of the existing PM standards1.

The IPMA Organisational Competence Baseline (OCB) adds an insightful dimension to the world of projects, programmes & portfolios, the perspective of organisational competence in project management. It perceives projects as an integral part of an organisation. Thus, an organisation - as a social system - needs to build up competences for managing a multitude of projects. It is a key task of the top management and senior executives to develop the organisational competence in project management, building on the organisation's mission, vision and strategy in order to reach the strategic objectives.

Organisational competence in project management takes into account the complexity of the project-related work. It builds on people and all kinds of resources involved, integrates necessary processes, structures and cultures with those of both internal and external partners. Finally, it links project-oriented governance and management systems with the corporate governance and management systems.

2. PURPOSE FOR APPLICATION OF IPMA OCB MODEL

The main purpose of IPMA OCB as a standard is to demonstrate the role of an

organisation and its management in the field of project-related work, to describe the concept of organisational competence in project management in order to realise the vision, the mission and the strategy, and finally to show how an organisation can develop its competence in a sustainable manner. The OCB provides a holistic approach for organisations strengthening their way of managing projects, programmes and portfolios.

The IPMA OCB standard – similarly to all other standards - is rather generic and written for application in all kinds of organisations and cultures. Thus, it is up to the user to decide how this standard could be applied in a specific context and how it could be tailored to the needs of a specific organisation. The IPMA OCB is a guide, giving orientation and general understanding for the people involved in the field of PP&P management. It could be used for the purpose of teaching, training and coaching of people within an organisation. Furthermore, the management system for PP&P could be analysed, assessed, developed and continuously improved. Finally, organisations could be benchmarked or certified on the basis of this standard.

There are four basic OCB principles:

- strategic orientation of PP&P competence model;
- comprehensiveness of well-structured competence elements for PP&P organizational activity;
- consistency of PP&P competence model;
- independence from assessment methods, tools and technic.

The main users of OCB are as follows:

The senior executives of an organisation can use this standard to understand the role of PP&P for executing and controlling the mission, the vision and the strategy. It helps them revisit their own role in contributing to the organisational competence in project management, analysing the current status of their organisational competence in project management, identifying areas for improvement, and directing stakeholders, resources and activities in the development of the organisation's project management capabilities.

The top management could also use the standard to enable executives and other relevant personnel to identify organisational dimensions in need of adjustment in order to more fully developing the organisational competence in project management, planning the investments (e.g. personnel, financial resources) for the immediate demands and on-going development activities. Finally, they could use this IPMA OCB to involve external partners for the purpose of benchmarking, assessment, certification and consulting.

Executives responsible for directing project management activities (e.g. PM Director or PMO Director) could use this standard in a similar way to Senior Executives. Being directly involved, they may better understand the requirements for change (e.g. resulting from assessments or benchmarking activities), ensuring that the organisational competence in project management continually satisfies the organisation’s mission, vision, strategy and that the intended results are achieved. Furthermore, the OCB offers them a framework facilitating an enhanced interaction with different stakeholders such as senior executives (demonstrating the value of project management etc.), line organisation, project staff, as well as external parties, while developing a common understanding of PP&P management

and implementing adjustments resulting from assessments or benchmarking. For PP&P managers, this standard shows the context in which they are acting and what they need to take into account whilst managing projects, programmes and portfolios. Besides understanding the concept and their role within organisational competence in project management, the PP&P managers could be in charge of implementing recommendations to address the most relevant and potentially the most effective elements of organisational competence in project management, as well as reporting on the impact of changes resulting from improvement activities to concerned executives and organisational staff. Furthermore, they could use this standard in a targeted way to directly improve the management of their projects, programmes or portfolios, managing all related stakeholders in an appropriate way.

Internal or external PM consultants can work with the staff from the line organisation and projects to develop the organisational competence in project management in a holistic way taking the results from assessments or benchmarking activities into account 2. Consultants can also support executives and staff to use the IPMA OCB as the basis for improving their performance and for developing organisational competence in project management in a holistic way, e.g. through training, coaching or consulting.

3. BASIC APPROACH TO THE DEVELOPMENT OF ORGANISATION COMPETENCE IN PP&P

Projects are increasingly becoming an accepted means of reaching goals. Many organisations deal with an increasing number of projects and programmes in the areas such as research & development, product development, marketing, investment and organisational change activities. To meet these and other complex and dynamic challenges, organisations should focus on project-related competences and develop them in a sustainable manner. It is not sufficient to have highly motivated and competent people. Today's challenges require organisations to deal with project management competences in a structured, holistic way in order to be successful.

Various aspects of complexity are imposing challenges on project managers. The content of projects is complex (e.g. in automotive industry projects deal with various hardware components, comprehensive software systems and integrated infotainment tools). All functional departments dealing with special technologies need to be integrated and thus aligned to the project goals. The number of internal and external parties involved in projects is rapidly increasing, demanding flexible communication as well as information structures, and optimised interfaces. Internationally spread project teams add to complexity such as requiring project teams and their managers to integrate intercultural differences and to manage virtual project set-ups.

An increasing number of projects and programmes require organisations to balance temporary and permanent parts of an organisational structure. Specialized units such as Project Management Offices (PMO) emerge, offering their services to project staff as well as governing institutions and senior executives. Portfolios embody projects, programmes and sometimes even sub-portfolios, helping Senior Management to align all project activities with the strategy.

Another challenge for an organisation is to deal with growing expectations of stakeholders (e.g. the demands of customers to get high quality deliverables in short lead-times at a competitive cost). Employees want to develop their career through projects and thus require a competitively attractive work environment. Suppliers and partners require an organisation to be ready to build mutually beneficial relationships and cooperate on a fair basis. Thus, project management needs to increasingly deal with human factors - key among these are leadership, motivation, trust, and relationship management. The behavioural competencies are increasingly important for project managers and executives.

Resource shortages drive many organisations to recognise the need to efficiently plan and deploy scarce resources such as financial assets, personnel, knowledge, facilities, material and equipment in PP&P. Planning and controlling of resources needs to be done from a multi-project perspective (e.g. from a portfolio level) in order to do the right projects in a right way. In a competitive world, organisations constantly need to strive for better performance, maximising opportunities and minimising risks imposed on them.

Constant changes in the society, economy, politics and technology requires an organisation to continuously determine their optimal organisational design and change accordingly. It needs to balance stability with flexibility, encouraging employees to be creative and change their way of work, while building on the experiences, rules and regulations derived from the past. Similarly to the nature, an organisation needs to develop in an evolutionary way, using all the wisdom and knowledge available, leveraging them through organisational learning in order to sustain and grow.

These challenges vary from organisation to organisation, depending on their constitution and the context they are operating in. Thus, organisations should regularly analyse their context, identify relevant trends and align their strategies, processes, structures, cultures and competences. Standard solutions might be simple to use but will reach their limits in a challenging world. Tailored approaches, building on a long-term mission, vision and strategy, responding flexibly to external challenges and striving to reach excellence is what an organisation's management needs to achieve.

What are the relevant perspectives on organisations?

The term "organisation" is used in various contexts. In a business context, it usually means a company, a part of a larger corporation or a joint venture of several companies. Furthermore, there are organisations in the not-for-profit and public sectors as well as in our private lives (e.g. clubs). Organisations exist to generate collective coordinated actions.

In the IPMA OCB, we differentiate between two kinds of organisations: a permanent organisation, which remains over time, and a temporary organisation, which is used for time-bound projects and programmes, closing at the end.

The project environment is composed of temporary project(s) and programme(s) organisations as well as permanent units for multiple projects and / or portfolio management (strategic and / or top management levels). In addition, the permanent organisation has functional units for

product and service delivery. The units interact with each other to achieve the organisation's objectives in an effective and efficient way. Each organisation can be defined by an inside and an outside perspective. In the external context of an organisation, we could find customers, regulators, and partners (e.g. suppliers, contractors, and other business partners). There are other contextual factors to consider, such as science and technology, economy and legislation, society, and nature, to name only a few.

The smallest unit in an organisation is a team with a common goal or task. Several teams, fulfilling a specific function within an organisation, could be grouped into a department. If necessary, departments could be grouped into a division. Organisations can be seen as a group of interrelated organisational units, which are arranged for achieving long-term objectives.

Organisations can be looked at from various perspectives. One is to look at it as an orderly arrangement of structures, typically shown in organisation charts with descriptions of roles, authorities and responsibilities, defining the hierarchy of all people involved. An organisation can be seen as an arrangement of processes, transforming the input into the output. The (work) flow of all processes defines the value creation from a customer expectation throughout the delivery.

Other perspectives emphasize the communication and information flows between the people in an organisation, the power and politics (often causing conflicts and disturbances) or the different cultures within or between organisations. This is why organisations are often called "social systems".

A final perspective to be discussed is that of the organisational change and the evolutionary development path it pursues. All perspectives are important to consider while analysing or developing an organisation in its context. Looking only at one perspective (e.g. the process perspective), we would run the danger of losing important information.

What is organisational competence in project management?

The IPMA OCB defines the organisational competence in project management as an ability of organisations to integrate people, resources, processes, structures and cultures in projects, programmes and portfolios within a supporting governance and management system. Organisational competence in project management is specifically aligned with the mission, vision and strategy of the organisation and intended to achieve results as well as to ensure continuous organisational development.

An organisation is shown with boundaries separating it from the external context. In the external context, the organisation needs to cope with different kinds of stakeholders such as customers, suppliers or service providers. The organisation also needs to deal with legislation, regulations, cultures, markets, the environment, and with the available resources to fulfil operational needs. The activities of the organisation need to be based on solid knowledge of all these contextual factors and potential changes in the conditions.

Within the organisation's boundaries, the internal context is built on the factors such as various stakeholders, culture, permanent organisational units (such as line or support functions), management and governance systems with their standards, regulations and

guidelines, as well as resources, to name only a few.

To start with, the governance and management of all projects, programmes and portfolios (PP&P) need to be linked with the organisation's overall governance and management system. The principles of Corporate Governance are translated into the PP&P governance system and all PP&P management functions are linked to the organisation's management system.

The integration of all internal and external processes in projects, programmes and portfolios is crucial for efficiency. This means to align the product and support processes with the processes used in the PP&P. Furthermore, these processes need to be aligned with the relevant processes of external partners, such as customers, suppliers or regulators. This process alignment is usually done through a synchronisation of milestones or quality gates.

Another important aspect of integration in the concept of organisational competence in project management is the alignment of all organisational structures. Alignment is needed between temporary parts of the organisation (e.g. PP&P functionalities) and all permanent parts, between roles and responsibilities in the PP&P and other parts of the organisation, between the internal units and the units of external partners, as well as the alignment of structures for communication, reporting, decision making and escalation. The alignment aims at a smooth and efficient operation through all interfaces.

People tend to develop a certain culture working within a social system. The culture is a set of shared views, values, or beliefs, guiding people consciously or unconsciously through their actions. In international projects, we often observe different behaviours of people from other countries. We might feel uncomfortable or be unsure how to react. The same applies within or between organisations. Organisations develop a kind of corporate culture embedding all the shared views, values, or beliefs of the people involved. Looking deeper into an organisation, we find variants of this corporate culture, e.g. in research, people need more space to manoeuvre in order to be creative. Within temporary organisations for projects and programmes, a special project-oriented culture develops.

The typical elements of a project-oriented culture are a strong focus on the results and a clear team orientation, a significantly higher tolerance towards ambiguity and failures, extroversion and an open exchange of knowledge. People working within a project-oriented culture need to align to the cultures of all internal and external partners, otherwise it will be really difficult to reach an effective cooperation and not end up in conflicts. The top management should seek to encourage a project-friendly corporate culture within an organisation, allowing the temporary project and programme teams to create an effective working space within the permanent parts of the organisation. Exemplifying cultures and encouraging communication about the differences in cultures help develop cultural awareness and align permanent and temporary parts of the organisation as well as to better cooperate with external partners.

Organisational competence in project management is built on the most important assets an organisation embodies – the people and their individual competences. The

competence needed for all PP&P managers, team members and personnel interacting with projects, programmes and portfolios should be defined. Recruiting and competence development activities should be based on these plans and support the development of organisational competence in project management.

Other resources of relevance for the PP&P include e.g. finance, intellectual property rights, material, equipment and facilities. All these resources need to be taken into account developing the organisational competence in project management.

Organisational competence in project management develops in response to many factors over time. The triggers for this development could be external events such as economic turbulences or the availability of new methods in the field of project management. Internal circumstances, such as the availability of a newly hired project management professional organising the project in a more effective way, as well as continuous improvement activities used to leverage organisational competence in project management are examples of other triggers. An organisation will mature through these triggers, following an evolutionary development path.

The top managers of an organisation have a crucial role thoroughly analysing the current status-quo of organisational competence in project management, setting clear goals for future developments (e.g. strategic goals for project management including goals for effectiveness, efficiency and overall performance), and implementing appropriate action. They should pro-actively implement standards for organisational competence in all project management elements, monitor and control the application of standards and encourage sustainable development. This includes but is not limited to the use of the lessons learned from the previous projects, building communities of practice for the PP&P personnel, exchanging experiences and benchmarking the organisational competence in project management with internal and external partner organisations.

In Figure 1 the groups and the competence elements are shown in context. This is a reference model for assessment of organisation competence in the PP&P.

Figure. 1. Reference model of Competence Elements

The first group G of competence elements is the PP&P Governance. The PP&P Governance is part of Corporate Governance concerning projects, programmes and portfolios. Usually, PP&P Governance is performed by the top management or steering boards. It includes, but is not limited to, the provision of strategic views, policies, guidelines, leadership, decisions, monitoring and controlling the performance and directing sustainable development of the organisational competence in project management.

The second group M of competence elements is the PP&P Management. The PP&P Management is part of the organisation's management system concerning projects, programmes and portfolios. It is performed by management functions on different levels, either in permanent or temporary parts of the organisation. In this group, there are competence elements for the management of projects, programmes and portfolios.

The third group A of competence elements is the PP&P Organisational Alignment. This group of competences relates to the overall goals and expectations towards performance, as set by the top management. It is performed by PP&P managers with support of other managerial functions. In this group, there are competence elements for the alignment of processes, structures and cultures of the PP&P with internal and external parties.

The fourth group P of competence elements is the PP&P People's Competences. This group of competences relates to the overall goals and expectations towards people competences, performance and recognition, as set by top management. It is performed by the PP&P management supported by Human Resource (HR) Management together

with other managerial functions. In this group, there are competence elements for defining the requirements for people's competences, the acquisition of suitable competences and their sustainable development.

The fifth group R of competence elements is the PP&P Resources. This group of competences relates to the overall goals and expectations towards resource availability and utilisation, as set by the top management. It is performed by the PP&P management together with various support functions (e.g. finance, legal, purchasing, technology). In this group, there are competence elements for defining the requirements for resources, the acquisition of suitable resources and their development.

Organisational learning to improve competence in managing projects could be achieved through continuous feedback loops for each of the five competence elements in the reference model. In addition, the reference model could also be used for further development through a general feedback loop (organisational learning arrow from results back to mission, vision, strategy in Figure 1) harvesting the lessons learned from completed projects and programmes.

4. BALANCING OPERATIONAL AND PROJECT ACTIVITIES OF ORGANISATIONS

The balance of operational and projects activity plays an important role in a sustainable organisation development 3. The conceptual success formula for the application of the OCB model could be expressed as:

Governance + Management system + Organisational context

=

Organisational competence managing projects and Organisational learning

The main balancing criteria are:

- reaching short and long term operational organisation goals based on a selected strategy;
- supporting sustainable development of an organisation based on the OCB as the reference model for project governance, management, organisational alignment, resources and people competences;
- maximising a synergy between operational and project activities in the organisation.

Sberbank of Russia is an outstanding case of using the OCB model successfully through the following steps:

1. In summer 2010 Sberbank applied for the IPMA Delta certification. In December 2010 a successfull IPMA Delta® Assessment, conducted for the IT Block of the bank, was completed. For the first time in Russia, the bank's IT-block was nominated for a class 2 ("Defined"), meaning high capability to fulfill complex IT projects on national and international levels. The President of Sberbank, Mr. German Gref, commented by saying: "It is surprising for me that our competency development model for Sberbank of Russia has similar principles as the international IPMA Delta model. Now we are sure that we are heading in the right direction with our strategic development and we can achieve our very ambitious goals in 2014 to enter the five largest banks in the world".
2. The project "Corporate CRM system" made in the bank became a finalist of the IPMA Project Excellence (PE) Award in the «Project Excellence in Big-Sized Projects» category in 2011. Up to day, Sberbank has been the second bank only to reach the finals of the

prestigious international competition. The lessons learned were widely used in the latest projects of the bank and even enabled the Sberbank Russia to get the PE Award 2012 for an IT infrastructure project (The Basic Product).

3. The efforts regarding the development of the managers' leadership abilities (inside and outside of the project) were reflected in the IPMA Delta® report 2012, which has shown the following strengths in the IT Bloc of the bank:
    a. The bank's Development Strategy up to 2014 gives directions for the PPP Management of the IT Block.
    b. The management attention for the management of PPP and th einvolvement of top management through the strategic committee (which sets the goals for the PPP).
    c. The top level management is well involved in the PPP through the respective committees. Managers also show their commitment by having "open doors" for PPP Managers.
    d. There are entities and functions for PPP management such as the Strategic PMO, the PMO of the IT Block and several project offices on the third level. They were built up during the last years and drive the IT Block towards professionalism in PPP management.
    e. While hiring a lot of new and experienced people there has been a significant move towards a project culture within the Sberbank IT block. Management addresses the need for a project oriented culture.
    f. There is a lot of energy and passion among managers and people involved to develop project management to a higher level.
    g. A special Project Management office (PMO) at the IT Block cares for the PP&P standards, processes, methodologies, techniques and tools.
    h. The treasury is aligned with the project portfolio(s) and the financial resources are well planned, monitored and controlled.

5. FINDINGS

The OCB offers a useful reference model for assessing current competence class and show road ahead based on wisdom of the assessor.

The business case of Sberbank Russia shows a practical advantage of applying the OCB model in balancing operational and project activities in an organisation, and how the external feedback received from the PE Award 2011 (finalist status) was passed on to the next project through an organisational learning process as an important factor enabling to reach the Award Winner status for the following project in 2012.

During the 12 years' experience with the IPMA PE Model and Award there are also several other striking examples of how organisational competence in projects have been validated through external assessment and benchmarking such as e.g. the Chinese Academy of Space Technology and Siemens Mobility.

In 2006 the Chinese Academy of Space Technology (CAST) became the IPMA PE Award winner with a manned spaceship project (Shenzou 6), and according to the team lead assessor (Erik Mansson) "This is the benchmark of PE among all world class projects I

have assessed during 12 years since the start of the PE Award in 2002 ". An area of particular excellence was the knowledge transfer of PE experience within CAST and China (the project management knowledge gained was also published through a book). Although in this case the assessment focused on an individual project (PE) and not on organisational competence (IPMA Delta), the extraordinary project achievements were reached thanks to a continuous and persistent strive to foster organisational project competence. Thus, there is no doubt that such an organisation would also score very well in an assessment of organisational project competence based on the OCB.

The German based but global organisation, Siemens Mobility, is an example of how the PMO could play a crucial role in providing the platform for organisational competence in projects balancing operational and project activities. In this case the PMO has been very successful in supporting projects by promoting the integration of people excellence, project excellence and process excellence resulting in an increasing degree of maturity in project management. This has enabled Siemens to year after year consistently deliver world-class projects all benefitting from the support of the permanent organisation including a very strong process support. Siemens has also actively used the PE Model and the PE Award for internal and external benchmarking, establishing best practices and a knowledge base for optimising the future project work, with the PMO taking responsibility for harvesting and passing on the lessons learned. Therefore, there is a logical explanation why Siemens is the only organisation so far that has won the PE Award in two consecutive years including:

- PE Award 2009: Siemens China: Beijing T-3 airport expansion project (luggage handling)
- PE Award 2010: Siemens Germany: VELARO Russia (high-speed railway St Petersburg – Moscow)

6. CONCLUSIONS

Through the practical examples presented in this paper there is plenty of evidence that organisational competence in managing projects is a key success factor in translating organisational mission, vision and strategy into consistently excellent project results. In order for an organisation to support and foster this competence development it is necessary that a way be found of effectively balancing operational and project activities. To achieve this there is a need for a competence centre in the permanent organisation such as e.g. a PMO and a method to follow. In many cases successful organisations have developed their own in-house methods and the best way to verify success is to assess how actual project results develop over time, and to what extent they they have been achieved through project management e.g. using the PE Model for either self-assessment or external assessment. In this context, the OCB reference model constitutes a comprehensive method for the development of organisational competence.

REFERENCES

[1] Azarov N.Y., Yaroshenko F.A., Bushuyev S.D. (2012), Innovative principles for managing development program (second edition), "Summit-Book", Kiev, 576 p.

[2] IPMA (2006), ICB IPMA Competence Baseline, Van Haren Publishing, Zaltbommel – NL

[3] Cleland D., Ireland L. (2008) Project Manager's Handbook, Mc Graw Hill, Fachinger, J. (2006). Behavior of HTR fuel elements in aquatic phases of repository host rock formations. *Nuclear Engineering & Design,236,* 54.

KNOWLEDGE MANAGEMENT AND LEARNING

Petar Jovanović – *PM College, Belgrade*

Abstract: This paper deals with contemporary issues of knowledge management and the learning process, their relation and influence on change and innovation. Besides individuals, organizations also learn, so we also point out the concept of the learning organization and the impact of this concept on the creation and use of knowledge.

Key words: Learning, knowledge, change, innovation.

1. INTRODUCTION

In order to reduce the uncertainty of future events and actions that are being taken to ensure the functioning and development of the organization, it is necessary to use new management methods and approaches. Knowledge management, learning, change management and innovation management are new management disciplines that bring new approaches and new opportunities in solving uncertain and complex business problems.

Knowledge management represents a new management concept, a new specialized management discipline that deals with the collection, dissemination and use of different knowledge in an organization, in order to increase productivity and improve efficiency of operations, i.e. to achieve competitive advantage [5].

The objective of knowledge management is to provide the latest knowledge and forward it to be used by decision makers. This means to ensure that the required knowledge is available to the right people at the right time and that it is used to improve business efficiency, introduction of change and innovation [2, 8].

To create and acquire knowledge permanent learning is necessary, and this make the process of knowledge associated with learning, and hence with the introduction of changes and innovations without which there is no improvement in efficiency and competitiveness.

Learning is a complex process that generates new knowledge, enables new ideas and innovation, which all lead to the necessary changes in the organization. Learning creates knowledge, knowledge generates ideas and innovation, ideas and innovations lead to change. Changes lead to new knowledge and ideas and so this interconnected process goes on continuously in organizations using change management and knowledge management to improve their market position and create a basis for further development.

Learning is directly related to the acquisition of knowledge and the introduction of changes. In order to introduce change and modify and innovate their organization, employees must learn continuously, acquire new knowledge that enables the change and innovation, and thus improve the efficiency and competitiveness. But learning applies not only to individuals, but to the entire organization. Organizations learn by learning of individuals, but also learn from each other [11].

Organizations learn through individuals by collecting and systematizing knowledge of individual experts and shaping it into specific processes, practices, and procedures that become practice. Organizational learning is a process of acquiring new skills and adapting to change, so it is often emphasized that organizational learning is a particular way of adapting the organization to external influences and changes [9].

The time for learning and knowledge, the time of change and innovation based on learning and knowledge creation is coming. Individuals learn, and so do organizations. There is individual learning and cooperative learning. There is learning from each other, learning of the weaker from the better. Learning from theirs and from the other's experiences. Those organizations that learn faster create knowledge faster and use it in

practice; they become more successful and competitive. It is believed that today's learning and knowledge are the most important sources of competitive advantage, and that learning organizations are more successful than others. They are characterized by the acquisition of organized knowledge, the introduction of rapid change and innovation, effective teamwork and leadership.

2. ORGANIZATIONAL LEARNING

Learning is a complex process that improves the existing and creates new knowledge, new ideas, views and opinions. Learning is an active process of acquiring new information and knowledge that enable individuals to change their views, attitudes and opinions and to develop new ideas, action and solutions. The learning process leads to changing a learner himself. The learner changes his (or hers) mind and views and thus leads to a new approach to the problems and possible solutions. In this way, the individuals develop new approaches and solutions, develop their creative thinking and generate new ideas, actions and strategies. In order to learn individuals need to be motivated, and individual learning in an organization should be well prepared and organized [1].

Organizational learning and the learning organization are two very closely related concepts that are essentially different. Organizational learning refers to the specific activities to be undertaken in an organization, while a learning organization is determined by the type of organization in which the organizational learning is a dominant approach.

There are numerous and quite different definitions of organizational learning. The literature is dominated by three groups of definitions that consider organizational learning from a cultural (sociological) point of view, from a cognitive standpoint and from the standpoint of behavior change [10]. The definition of organizational learning from a behavioral point shows that organizational learning leads to the change in organizational actions and behavior. This means that the knowledge that an organization acquires from learning affects its future behavior.

From the cognitive point of view, organizational learning is considered to be a process of improving actions through connections with the knowledge, understanding and insight. Levitt and March [6] define organizational learning as a translation of knowledge or lessons learned from past routines that will be used for future actions and future behavior. From a sociological point of view, organizational learning is viewed through the change of meaning and actions that result from common practice which derives from the interaction of individuals in the organization.

Organizational learning is a very complex phenomenon, both from the point of view of creation, and from the standpoint of keeping the learning outcomes. Organizational learning is clearly related to individual learning, because within the organization various types of individual learning are certainly performed. Within the organizational learning it is necessary to transmit the results of individual learning through the organization to be used in achieving the organization's objectives. The results of individual learning can be very easy retained by individuals who learn, while the results of organizational learning are not easy to maintain. All this contributes to the complexity of organizational learning and brings problems in reviewing and defining the phenomenon [9].

Organizational learning is a complex process of providing new knowledge and represents the basis to build a learning organization. Since an individual carries his knowledge with him, a problem may occur if some individuals leave the organization, and there are no organized systems of learning and acquisition, transfer and retention of knowledge within an organization. This means that organizational learning should lead to a situation where the knowledge of the organization is not just the sum of individual knowledge; knowledge of certain individuals should be transformed to the procedures and standards used by the organization, i. e. that could be used by people in the organization.

It is often said that the learning process leads to change of mental framework or mental model which has been adopted by individuals.

This means that each individual has adopted certain concepts or assumptions enabling him to understand the mode of operation and functioning of the organization, the organization's goals, relationship with the surroundings, customer requests, etc.

Through the learning process people change these assumptions and rules, change the approach to problems and accept new knowledge that can be further used. Individuals learn through accepting and systematizing new knowledge, new ideas, new experiences and new methods of work and behavior. Organizations learn through individuals by systematizing and organizing their knowledge and converting it into standard practices and procedures that are widely at one's disposal, and are available to all employees even when individuals who possess that knowledge leave the organization.

3. LEARNING AND KNOWLEDGE CREATION

Analysing learning as a complex process of acquiring knowledge that leads to change and innovation and improve the efficiency and competitiveness of the organization, certain features of this process which may help in analysing and improving the process can be singled out.

Learning, through the acquisition of new knowledge and new ideas brings changes in thinking and behavior of the individual and this is an important feature of the learning process. It is expected that learning results into a noticeable increase in knowledge, which will be expressed through new ideas and possible (potential) or real (actual) change in behavior of individuals. Namely, learning may lead to a real change in behavior which is reflected in changes in the behavior of individuals at the present moment, namely, after learning.

However, learning can lead to the possibility of change in behavior that is not carried out immediately, but that can happen, possibly in the future. The time that elapses between learning and behavior change plays an important role in the recognition of the changes in behavior. Because change can be affected by many other factors, determining the exact relationship between the doctrine and behavior change is difficul.

Learning brings new knowledge to individuals and organizations and it causes change, and change, in turn, requires transformations which should result in a performance enhancement of the organization. The changes and transformations in the organization are necessary to make the organization go forward and be able to implement better business results; one cannot survive without these on the market. Changes in individuals induced by learning and new knowledge increase the capacity of the organization that is changing, being refined and improved by achieving better business results, which are the basis for further progress and development of the organization [1, 6].

Learning is a continuous process for both the individual and the organization. In the process of learning and acquiring new knowledge there are no standstills. Any pause means the failure to acquire new knowledge that is necessary to bring the organization to change and innovation, which can be devastating, not only for development, but also for the continued operation of the organization and for its survival. The scientific and technological progress constantly brings new knowledge that one must constantly study and learn, so individuals and organizations must be willing to continuously learn and acquire new knowledge.

Only productive learning is important for the organization, because it brings opportunities for change, innovation and transformation, and thus for improving the performance of the organization. Just learning that leads to a noticeable increase in the adoption of new knowledge, which will be expressed in the new ideas, increased employee creativity, change and innovation can be defined as productive learning.

Individuals and teams in a learning process appropriate the new knowledge that they transform into routines, procedures and guidelines and turn them into forms that remain in the organization. The individual keeps his knowledge in his brain while the organization must turn knowledge of individuals and teams into procedures, guidance, knowledge bases, expert systems,

etc. and thus preserve certain knowledge, to avoid that a departing individual may take certain knowledge with them [3].

Learning does not necessarily bring the desired knowledge. Learning can be wrong, ineffective and inaccurate. In the sea of literature from a specific field an individual can spontaneously choose incorrect and poor literature, and it is possible that teachers and mentors advocate false ideas and opinions that they convey to individuals they educate. When it comes to learning and the acquisition of theoretical knowledge, only reputable educational institutions and organizations should be respected. And for practical learning and practical knowledge, one should attach himself and learn only within the framework of reputable organizations and individuals.

4. LEARNING, KNOWLEDGE AND CHANGE

When we analyse the relationship of change and knowledge, i.e. change management and knowledge management, we must assume that there are two specialized disciplines that are based on the principles and preferences of general management and from this stems a clear correlation between the two disciplines.

This matter related to the change and knowledge has its further implications and connections to learning, to an increased creativity, innovation and development so that it is necessary to consider the relationship between change and knowledge in a wider context, taking into account the needs of businesses and other organizations to function undisturbed and develop in a dynamic and ever-changing environment that requires a permanent increase in efficiency and competitiveness [5].

The modern world in which we live and act brings the fast progress in all the aspects of human existence, so the changes are mostly rapid and large-scale. Contemporary organizations, for the most part, are not prepared for large, sudden and rapid change. They are used to the slow and gradual changes, which give plenty of time to prepare. Rapid changes require quick responses and solutions and require the knowledge in organizations to adapt and introduce them. Without proper knowledge it is difficult to introduce changes, especially changes that bring improvements, innovations and new knowledge. A cyclic process of continuous change produces knowledge and connections between knowledge and change, contributes to an enhanced competitiveness of the organization and results better business outcomes [3].

The correlation between achieving change and knowledge creation leads to the need to solve the problem of change management so that we can introduce changes that produce knowledge. The creation and introduction of changes should be a shared objective for all employees, not just managers. Effective changes that produce knowledge cannot be dictated [5].

In order to detect and analyse changes that produce knowledge we must link knowledge, learning and change. New knowledge, as a result of learning, is necessary for change i.e. successful change is one that is based on learning and knowledge, the change that allows new learning and new knowledge. It is learning through changes, and it is also a change that produces knowledge. It is clear that the basis of new ideas, innovations, and changes that are necessary for an efficient functioning of contemporary organizations is permanent learning and creating and using new knowledge. Knowledge produces and creates change, and changes provide new knowledge. This is a clear link and a cyclic process that must be continually maintained in order to maintain the continuity of the functioning and development of the organization.

All new knowledge encourages and sometimes requires changes. If new knowledge is embodied in a new or improved product or service, then it will be necessary to make certain changes in the organization of production, so that a new or innovated product can be realized, possibly to introduce new technology or adapt an existing one, then make changes in the marketing strategy and promotion of a new product, to train people to work with new production and business processes, and so on.

This is a general approach, while in practice a series of individual improvements and

innovations actually appear as a product of new knowledge, which requires some changes in various areas to be implemented.

There is an obvious connection between learning, knowledge and change. Learning enables a creation of new knowledge and new knowledge bears innovation and change whose implementation is converted into new products needed at the market which continues to lead to new knowledge. This correlation is shown in Figure 1. [5].

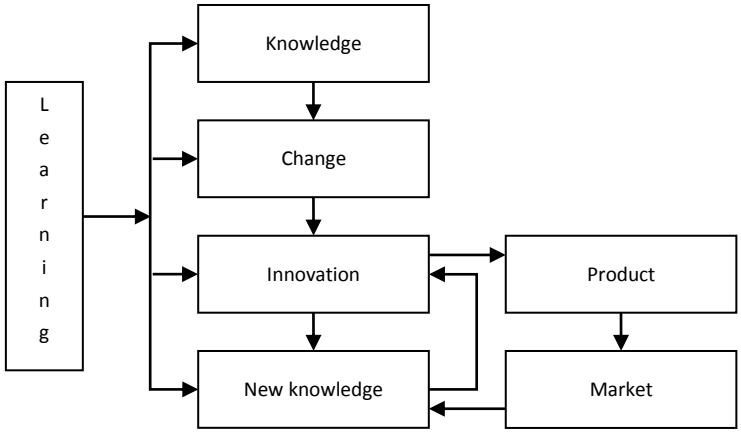

Figure 1. Connection between learning, knowledge and changes

Without learning there is no new knowledge. Without knowledge there are no new ideas, change and innovation. Without change and innovation there is no efficiency and competitiveness, there is no progress and development. Without development there is a stagnation and collapse of the company. Basically, all these are a continued efficient functioning and development of the individual and the organization, development indicating an uncertain future we aspire to and we are afraid of.

There is no doubt that learning and new knowledge contribute to increasing the efficiency and competitiveness of the organization. Namely, productive learning brings new knowledge that can bring the needed change and innovation, which can also contribute to the improvement of efficiency and competitiveness.

It can be said that the improvement of competitiveness and efficiency of the organization are in a way a ring of learning, knowledge, change and innovation, which is schematically shown in Figure 2.

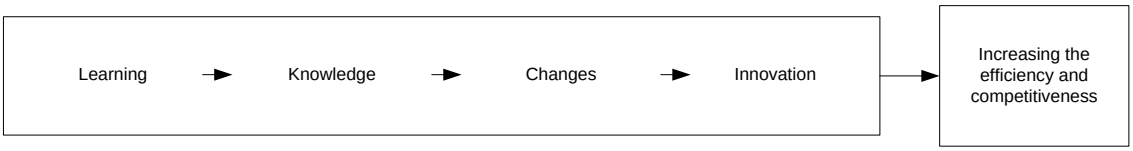

Figure 2. The impact of learning and knowledge on competition

Whether this willactually happen, i.e. whether learning and knowledge will lead to prosperity, is a separate issue, which depends on many factors. As all learning does not necessarily bring new knowledge, so it is not certain that the new knowledge will bring the required change and necessary innovation.

5. CONCLUSION

Looking for new and better methods and concepts that enable an increased efficiency and competitiveness, contemporary organizations use different ways of learning and acquiring new knowledge in order to achieve the necessary change and innovation. The introduction of changes and innovations into business processes enables improving the functioning and implementation of the strategic goals of the organization.

To make the organization efficiently operate and gain competitive advantage it is necessary

that knowledge should be continually acquired through the learning process. An efficient learning process requires a particular organization of a company, teamwork and leadership in solving problems and in implementing change, an open approach to the environment and an easy acceptance of other people's knowledge and experience.

The concept of organizational learning and learning organization and its linkage with the management of knowledge generate new opportunities for the introduction of change and innovation in the newly created knowledge base. It is quite clear that for the creation and application of knowledge continuously learning of individuals, teams and organization as a whole is necessary.

Only those organizations that continually learn and that encourage their employees to permanently acquire new skills have a chance in the today's globalized market game.

Learning, creating new knowledge and the introduction of changes and innovations are directly related and form an inter-linked cycle that is constantly taking place enabling organizational efficient operation and development.

REFERENCES

[1] Argyris C.: *On organizational learning*, 2nded., Oxford Blackwell Publishing, 1999.

[2] Bergeron B.: *Essentials of Knowledge Management*, John Wiley&Sons Inc., New Jersey, 2003.

[3] Davenport T., Prusak L.: *Working Knowledge: How organizations Manage what they know*, Harvard Business School Press, 2000.

[4] *Harvard Business Review on Knowledge Management*, Harvard Business School Press, USA, 1998

[5] Jovanović P.*: Savremeni menadžment*, VŠPM, Beograd, 2009.

[6] Levitt B., March J. G.: *Organizational Learning*, Annual Review of Sociology, Volume 14, 1988. 319-340

[7] Malhatra Y.: *Knowledge management for e-business performance – advancing information strategy to interne time*, The Executive Journal, Vol. 16, 2000.

[8] Nonaka I., Takeuchi H.: *The knowledge – creating company: How Japanese companies create the dynamics of innovation*, Oxford University Press, New York, 1995.

[9] Senge P. M.: *The Fifth Discipline*, Randow House, London, 1990.

[10] Tsang E.: *Organizational Learning and the Learning Organization: A Dichotomy between Descriptive and Prescriptive Research*, Human Relations, Vol. 50, No. 1, 1997, pp. 73-89

[11] Williams A., Woodward S., Dobson P.: *Managing Change Successfully*, Tomson, London, 2002.

VALUATION OF ENTERPRISE THROUGH NEW PROJECTS

Klara Jakovčević - *Faculty of Economics, Subotica*

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Abstract: The paper presents the valuation of an enterprise by applying the method of discounted free cash flow. The aim of the paper is to determine the contribution of capital investment on the expansion of production assortment to increase the value of an enterprise. The total cash flow of business operations includes the sum of predictable cash flows from existing assets and assets that are planned to be achieved by reinvestment of earnings in the future.

Key words: Enterprise valuations, free cash flow, profit, net profit, profit rate, capital reinvestment rate, cost of capital.

1. INTRODUCTION

Valuation is a process proceeding managerial decision making; e.g., in cases of the selection of capital investments, pricing, sales or purchasing the enterprise's assets, or choice of finance source. The economic science employs a wide range of valuation models, from the simplest to the most complex ones. All these models share the same basic principles, however, they also have certain specific features depending on the valuation object. It is a characteristic of construed models that they cannot eliminate the uncertainty linked to the future even if the enterprise-specific information is available. Hence the value obtained in the valuation procedure reflects both the optimistic and the pessimistic views the valuation procedure has started from. Over time, valuations can be updated if important new information is obtained from either the enterprise or macro economy.

2. APPROACH TO VALUATION PROCESS

The value of the enterprise obtained through the discounted cash flow is the function of the expected cash flows in the future business operation. The cash flow of the enterprise's total business is a sum of expected cash flows from the present and the future assets, i.e., assets expected to be obtained by reinvesting the profits in the future. The elements required for the evaluation model are the following: the expected cash flows, the time period in which the cash flows are planned and a discount rate that reflects the cash flow risk, where higher risk bears a higher discount rate. To determine the expected cash flows it is necessary to assess the expected profit growth rates, that is, net profits, as well as net capital costs necessary for the planned growth to be achieved in the future.

The Free Cash Flow of the Firm (FCFF) is the profit after tax, that is, net profit minus capital costs necessary to sustaining the planned growth (Pinto, J., Henry, E., Robinson, T., Stowe, J., 2010, p. 147). The capital costs required for sustaining the planned growth comprise the capital expenditures and the investments into non cash working capital. The capital expenditures, in turn, include capital investments into equipment, workshop construction, new products, investments into distribution, research and development, acquisitions. For planning the future cash flows of the enterprise it is necessary that capital expenditures should be averaged given that they come in unequal amounts, that is, a period of high investment is followed by a period of lower investments. An annual average of capital investments can be defined as a quotient of total investments in one period and the number of years in that period, capital investment expenditures share in the total revenue, total assets, profits or net profits.

The change in the non cash working capital is determined as the difference between the

current assets and the current liabilities. Loan capital to which interest is paid and which matures in the current year is not included into current liabilities, given that it is used when calculating the average capital costs (financing). The changes in the working capital may be both positive and negative. Working capital reduction results in the growth of the enterprise's cash flow, whereas the increase in working capital leads to the cash flow reduction. Working capital oscillations result from the change in the scope of operations, costs and incomes. One cause of the rise of the working capital amount is the rate of collection of receivables from the customers. A timely collection helps avoid the employment of additional capital sources and financing costs. A prolongation of due receivables collection, however, is one element of sales scope incentive, by attracting new and retaining the existing customers. Given the choices of increasing the sales scope and shortening the terms of collecting due receivables, it is necessary that a ratio between benefits (increased realization scope) and sacrifices (lower value of delayed collection for the amount of opportunity costs and additional costs of financing) should be assessed.

In order that the projection of needs for the working capital should not be based on an untypical base year, the changes in the working capital should be identified on the basis of one of the following criteria: working capital share in the planned income in the future period of a concrete enterprise, working capital share in the past period of a concrete enterprise, the industry average of the working capital share in the income. Given that the working capital in a majority of enterprises is changeable and unforseable, it could be omitted in the forecasting of the future cash flows of the enterprise and the projects. The discounted cash flow of the enterprise starts from a premise that the enterprise does not achieve a tax advantage from the interest charges paid to the loan capital. The interest charges after tax and the expected revenue on own (equity) capital are included into the average capital costs used as a discount rate. Using this valuation model, the changes in the level of the enterprise's liabilities are, over time, built into the discount rate, rather than into the cash flows.

3. ENTERPRISE VALUATION USING DISCOUNTED CASH FLOW OVER DEVELOPMENT PHASES

Enterprise valuation by discounting the free cash flow over development phases will be presented on an example of a concrete enterprise that introduces a new group of food products from the “health food“ programme. It is assumed that by broadening its range of products the enterprise will achieve a **high growth rate phase** in the first five years; then it goes into a **transition phase** which lasts for three years, and then follows a **steady growth phase**. Enterprise valuation will be conducted for the entire operations (the existing + new lines of products). Before the project execution the enterprise earned a profit amounting to 65,460 thousand dinars, while the scope of realization was 1,550 tons. The production scope is planned to grow to 2,500 tons at the beginning of the steady phase. The total engaged capital amounts to 1,257,776 thousand dinars. The loan capital share was 33%. The annual capital expenditures planned for the following five years amount to 54,480 thousand dinars. The planned profits rate after tax, i.e., the net profits rate in this phase is 19.50% (don'). The tax rate of 10% is assumed to remain constant over time.

The reinvestment rate in the high growth rate phase is as follows:

$$kr=\frac{\Delta K}{Do(1-r_{\delta})}=\frac{54,480}{65,460(1-0.10)}=\frac{54,480}{58,914}=0.9247=92.47\%\,. \qquad (1)$$

The expected net profit rate amounts to:

$$g_{don} = kr \times don' = 0.9247 \times 0.1950 = 0.18 = 18\%. \qquad (2)$$

The average expenditure rate of the loan capital whose share increased to 40% in the financing of the enterprise amounts to 9.55%. The non risk investment revenue rate is 5%, the risk

premium is 5%, and the risk of investing into the concrete enterprise is assessed to be 2.

The weighted average cost of capital rate calculated by the WACC model, including the tax advantage for the loan capital (costs of capital after tax), is as follows:

$$r_{\kappa}=\frac{K_D}{K}\times r_D(1-r_{\delta})+\frac{K_A}{K}\times r_A = 0.40 \times 0.0955(1-0.10)+0.60\times 0.15 = 0.1244 \quad (3)$$

The average return rate on the enterprise shares is determined using the CAPM (Capital Asset Pricing Model):

$r_A = r_f + \beta_A (r_m - r_f) = 0.05+2.0(0.05) = 0.15 = 15\%.$ (4)

r_A – return rate on own capital; r_f – return rate on non risk investments; r_m – market price of the capital; $(r_m - r_f)$ – risk premium

Capital costs are to reflect the development phase of the enterprise. We assume that after the high risk phase, the risk of the shares of the concrete enterprise (β_A) will be reduced to 1.2.

The expected return rate on the **enterprise shares in the steady growth phase** will be:

$r_A = 0.05+1.2(0.05)=0.11=11\%.$

The weighted average cost of capital rate in the steady growth phase, under the assumption that the loan capital share increases to 50% and that the loan capital costs (interest rate) remain the same, is as follows:

$r_{\kappa} = 0.50 \times 0.0955(1-0.10)+0.50\times 0.11=0.098 =9.8\%$.

The annual net profit rate in the steady growth phase is planned to be 5% (optimistic variant), or 1.5% (pessimistic variant); while the net profit rate will amount to 9.8%, that is, it will be equal to the capital expenditure rate.

The capital reinvestment rate in the steady growth phase is as follows:

$$1)\ kr=\frac{g}{don'}=\frac{0.05}{0.098}=0.5102=51.05\% \text{ (optimistic variant);}$$

$$2)\ kr=\frac{g}{don'}=\frac{0.015}{0.098}=0.1531=15.31\% \text{ (pessimistic variant) .} \quad (5)$$

In the transition phase, that is, in the phase of transit from the high risk phase into the steady growth phase, a linear reduction of profit growth rate, average capital expenditure rate and reinvestment rate is applied.

Residual value (RV) of the enterprise

Cash flows cannot be projected for an endless period, hence planning has to stop somewhere in the future. In the year when further planning of cash flows stops, the residual value of the enterprise is determined, and it shows the value of the enterprise in that particular year. In this concrete case, we assume that after the eighth year the enterprise will continue operation in a steady growth regime where the growth rate and the average capital expenditure will stabilize, i.e., remain constant. The residual value is calculated using the Gordon Growth Model, as follows:

$$RV_n=\frac{SNT_{n+1}}{r_{\kappa}-g} \quad . \quad (6)$$

The value of the enterprise in the discounted cash flow valuation model is most strongly influenced by the steady growth rate (g). The growth rate effect is greater as the rate nears the average capital expenditures used as a discount rate in the valuation. Since the growth rate remains unchanged forever, there are certain limitations in determining its level. The upper limit of the steady growth rate is the growth rate of the economy in which the enterprise operates, since the enterprise cannot grow continually by a higher rate. In case the enterprise exports its products to foreign markets, or in case it intends to export, the steady growth rate cannot be higher than the growth rate of the economy the enterprise does business in. The steady growth rate also has to correspond to the values used in the valuation given that these can be nominal values (expressed in current prices) or real values (inflation effect excluded). In case of the valuation of real values the growth rate has to be lower. As a rule, the growth rate must not be higher than the non risk rate applied in determining the discount rate. In this concrete case, we assume that the growth rate will amount to 5% (optimistic variant), or that it will be lower and amount to 1.5% on an annual basis (pessimistic variant). In order that the residual value be set for the present day, it is necessary that discounting should be performed.

The residual value (RV) of the enterprise in the steady growth phase is as follows:

(1) Optimistic variant:

$$RV_8=\frac{\frac{SNT_9}{r_k-g}}{(1+r_k)^8}. \qquad (7)$$

$$RV_8=\frac{\frac{96,005}{0.098-0.05}}{(1.1244)^5\,(1.1178)(1.1112)(1,1046)}=\frac{2,000,104}{2.4658}=811,138 \text{ thousand dinars;}$$

(2) Pessimistic variant:

$$RV_8=\frac{\frac{152,942}{0.098-0.015}}{(1.1244)^5\,(1.1178)(1.1112)(1.1046)}=\frac{1,842,675}{2.4658}=747,293 \text{ thousand dinars.}$$

The value of the enterprise by phases, by applying an analytical formula is:

$$V=\sum_1^5 SV_{SNT}+\sum_6^8 SV_{SNT}+RV\ ;$$

(1) Optimistic variant: V = 25,697 + 64,834 + 811,138 = 901,669 thousand dinars;

(2) Pessimistic variant: V = 25,697 + 102,475 + 747,293 = 875,465 thousand dinars.

The determined expected value of the enterprise in its life cycle differs between the optimistic and the pessimistic variants by 2.9%. The difference in the estimated value results from the reduction of the growth rate in the steady growth phase (residual value) from 5% to 1.5% annually. In the concrete case, the effect of the difference in the estimated residual value between the optimistic and the pessimistic variants is 8.54%. The effect becomes higher as the growth rate nears the applied discount rate (9.8%). In case the steady growth rate of 8% is applied, the residual value will be 2,224,831 thousand dinars or 274% higher in comparison with the value at the moment the growth rate amounted to 5%. To determine the value of the enterprise's own capital, the estimated value has to be reduced for the value of the unpaid debt (loan capital).

4. CONCLUSION

The free cash flow of an enterprise is the cash flow before the debt repayment and after the necessary capital investments (capital reinvestment into the future profit growth). The discount rate equals the average rate of capital expenditure (loan capital expenditure + own capital expenditure). The change in the structure of the enterprise financing sources is built into the average price of the capital, not through the cash flows. The weighted average cost of capital includes the effect of a financial leverage whereby an advantage is achieved as it changes significantly over time. Namely, the change in the level of indebtedness over time results into the change in the interest charges and the debt repayment which complicates the calculation of the free cash flow. A reduced reliability of the information concerning the conditions of borrowing for the enterprise in the future causes a change in the policy of borrowing and this is affected by managerial decisions. The implementation of a large number of detailed, however, not reliable information can be counterproductive from the point of view of a more accurate assessment of the enterprise value.

Table 2. Enterprise valuation based on free cash flow (in thousands of dinars)

Elements	**PHASE I**					**PHASE II**			**PHASE III**	
	Y e a r s									
	0.	**1.**	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**
I Optimistic variant										
1. Total revenue (C)	585,580	786,669	998,175	1,168,755	1,282,335	1,382,377	1,466,097	1,524,686	1,567,156	1,592,484
2. Total costs (T)	520,120	709,426	907,028	1,061,202	1,155,422	1,232,620	1,294,251	1,333,078	1,359,740	1,374,697
3. Profit (Do)	65,460	77,243	91,147	107,553	126,913	149,757	171,846	191,608	207,416	217,787
4.Growth rate (%)	-	18.00	18.00	18.00	18.00	18.00	14.75	11.50	8.25	5.00
5. Do (1 – r_{δ}) net profit) (Don)	58,914	69,519	82,032	96,798	114,221	134,782	154,662	172,448	186,674	196,008
6.Reinvestment rate (kr) (%)	-	92.47	92.47	92.47	92.47	92.47	82.11	71.75	61.38	51.02
7. SNT	-	5,235	6,177	7,289	8,601	10,149	27,669	48,717	72,093	96,005
8. r_{κ} (%)	-	12.44	12.44	12.44	12.44	12.44	11.78	11.12	10.46	9.80
9. Discount factor	-	1.1244	1.2643	1.4216	1.5984	1.7972	2.0089	2.2323	2.4658	2.7074
10. SV_{SNT}	-	4,656	4,886	5,127	5,381	5,647	13,773	21,824	29,237	35,460

II Pessimistic variant										
1. Total revenue (C)	585,580	786,669	998,175	1,168,755	1,282,335	1,382,377	1,411,399	1,465,252	1,501,341	1,518,646
2. Total costs (T)	520,120	709,426	907,028	1,061,202	1,155,422	1,232,620	1,240,863	1,278,089	1,303,650	1,317,990
3. Profit (Do)	65,460	77,243	91,147	107,553	126,913	149,757	170,536	187,163	197,691	200,656
4. Growth rate (%)	-	18.00	18.00	18.00	18.00	18.00	13.875	9.75	5.625	1.50
5. Net profit(1 – r_{δ}) (Don)	58,914	69,519	82,032	96,798	114,221	134,782	153,482	168,447	177,922	180,590
6.Reinvestment rate (kr) (%)	-	92.47	92.47	92.47	92.47	92.47	73.18	53.89	34.60	15.31
7. SNT	-	5,235	6,177	7,289	8,601	10,149	41,164	77,671	116,361	152,942
8. r_{κ} (%)	-	12.44	12.44	12.44	12.44	12.44	11.78	11.12	10.46	9.80
9. Discount factor	-	1.1244	1.2643	1.4216	1.5984	1.7972	2.0089	2.2323	2.4658	2.7074
10. SV_{SNT}	-	4,656	4,886	5,127	5,381	5,647	20,491	34,794	47,190	56,490

REFERENCES

[1] Brealey R. A., Myers S. C., Marcus A. J. (2007). *Osnove korporativnih finansija.* Zagreb: Mate.

[2] Brecht, U. (2005). *Kostenmanagement - Neue Tools fur die Praxis.* Wiesbaden: Gabler Verlag.

[3] Damodaran, A. (2010). *Damodaran o valuaciji.* Zagreb: Mate.

[4] Hitchner, J. R. (2011). *Financial Valuation: Applications and Models* (3rd izd.). New Jersey: John Wiley & Sons, Inc.

[5] Koller, T., Goedhart, M., Wessels, D. (2010). *Valuation: Measuring and Managing the Value of Enterpriseies.* New York: McKinsey & Enterprisey.

[6] Invesments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics* (47), 13-37.

[7] Pinto, J., Henry, E., Robinson, T., Stowe, J. (2010). *Equity Asset Valuation.* New Jersey: Wiley & Sons Inc.

[8] Jakovčević, K. (2006). *Ekonomika preduzeća - ekonomska efikasnost angažovanja kapitala u reprodukciji.* Subotica: Ekonomski fakultet u Subotici.

[9] Jakovčević, K. (2000). *Struktura i vrednovanje kapitala.* Subotica: Ekonomski fakultet Subotica.

[10] Data for the "XY" enterprise.

PROJECT MANAGEMENT METHOD - PREPARATION FOR ENERGY MANAGEMENT CERTIFICATION OF AN ORGANIZATION

[1]Vojislav Božanić, [2]Bojana Jovanović
[1] *Faculty of organizational sciences, University of Belgrade*
[2] *Iritel a.d. Belgrade*

Abstract: Today, project management is used in various fields of business and in different industries. As the implementation of any system of management in the organization has the character of the project, the paper describes a specific practical methodology used in preparation for energy management certification of an organization, in accordance with the requirements of the ISO 50001 standard. The paper gives an overview of some of the definitions of project management. Because the paper deals with the project of implementing a management system, this paper defines the concept of energy management. The paper also offers an overview of basic characteristics and possibilities for application of ISO 50001 and a short overview of the current number of ISO 50001 certificates issued in the world. Finally, paper presents conclusions and directions for future work.

Key words: Energy management, energy performance, ISO 50001, project management.

1. INTRODUCTION

Since the beginning of the 1990s writers have introduced terms such as "modern project management", "management-by-projects", projects (project management) culture" and "beyond the Gantt chart" to distinguish contemporary and future forms of project management from traditional and past forms [8, 11, 17, 16, 9, 29]. Project management has progressed through several evolutionary stages and has become established as a well-known management method [26]. Furthermore, project management is considered to be a proven method of mastering complex tasks that must be completed under demanding constraints, such as high time pressure, the need to include specialists from different fields, and cooperation between different departments or companies [4; 26; 28; 30].

Much of the work conducted in organizations occurs in the form of projects [24]. In modern management, organizations are considered as open and complex systems interacting with environment and pursuing objectives according to their specific mission and nature [3; 33; 35]. The achievement of such objectives implies structuring the activities of the organization through projects with specific targets that should be consistent with the adopted organizational objectives [35]. One of the orgnizational objectives can be the implementation of the energy management system, in order to save energy and cut costs. Project management is constructed by the actions and interactions of practitioners, consultants, and academics/researchers through their use of language, communication of beliefs, and interaction in social situations [12; 37].

A project can be considered to be any series of activities and tasks that have a specific objective to be completed within certain specifications, have defined start and end dates, have funding limits, consume human and nonhuman resources (i.e., money, people, equipment) and are multifunctional (i.e., cut across several functional lines) [25]. Project management, on the other hand, involves project planning and project monitoring and includes such items as project planning, definition of work requirements, definition of quantity and quality of work, definition of resources needed, project monitoring, tracking progress, comparing actual outcome to the predicted outcome, analyzing impact and making adjustments [25].

Project management is the art and science of planning, designing and managing work throughout all the phases of the projects life cycle [1]. The application of project management concepts is an essential tool for planning, organizing, managing and control of work, which leads to better performance and

increased productivity, such as increasing the energy performance of the organization and also the financial performance as a consequence of implementation of an energy management system. Energy performance is measurable-results-related to energy efficiency, energy use and energy consumption (according to standard EN 16247-1).

2. DEFINITION OF ENERGY MANAGEMENT

The term "energy management" has been used differently in academic literature. Energy management is mainly focused on "implementation of energy efficient technologies and replacing inefficient equipment, as well as monitoring and maintenance of technology to preserve an efficient operation" [18; 6]. Energy management is a "process of optimizing energy consumption" [27]. It is multidisciplinary in nature [27].

[2] claim that "successful energy management consists of three parts: energy auditing to gain knowledge about energy flows, courses and training to increase and maintain awareness and house-keeping that includes keeping up the operations". [22] describes recommendation for energy management practices as "capture data, set efficiency goals, and communicate ongoing energy performance to stakeholders in an organization". [34] describe it as "a combination of engineering, management and housekeeping". Energy management means that all employees participate in energy saving activities, all energy consumption levels are known and these levels are regularly monitored [31]. As mentioned in the paper authored by [6] "data gathering and analysis help facilitate investments in technology but by working continuously it can also detect inefficiencies and malfunctioning equipment, optimize the energy system and evaluate the technologies performance".

Energy management system is the system for achieving the objectives of management of energy. According to standard ISO 50001, which sets the requirements for energy management systems, energy management system is a "set of interrelated or interacting elements to establish an energy policy and energy objectives, and processes and procedures to achieve those objectives." The energy management system standard (ISO 50001 and its predecessor EN 16001) are intended to organize the system in a manner to increase energy efficiency in the entire organization.

According to the Energy Office, the work community from five European countries (United Kingdom, France, Spain, Austria and Germany), energy management is "the sum of measures planned and carried out to achieve the objective of using the minimum possible energy while the comfort levels (in offices or dwellings) and the production rates (in factories) are maintained."

On its web-site, the "BizEE Software Ltd", a UK-based company making software to help organizations save energy, explains energy management as follows: "Energy management is mainly concerned with saving energy in businesses, public-sector/government organizations, and homes. When it comes to energy saving, energy management is the process of monitoring, controlling, and conserving energy in a building or organization."

As [6] mentioned "while studies of barriers to energy efficiency and the energy efficiency gap have largely focused on the diffusion of energy-efficient technologies, the extended energy efficiency potential would be higher if successful energy management practices were considered. Investments in technology and upgrading equipment generate improved efficiencies, but without maintenance and continuous monitoring the total efficiency potential will not be attained. Energy management practices can facilitate investments in energy efficiency by providing information about energy flows and potential savings, but it also contains a dimension that is less capital intensive and rather requires knowledge, attention and awareness".

The adoption levels of energy management are low, even in energy-intensive industry [36]. For example, a study of energy management practices in Swedish energy-intensive industries revealed that only 25–40% of the companies implemented energy management principles [36]. A study of energy management practices in Danish firms

found that only 3–14% of the studied firms practiced energy management [10].

The potential for improving energy efficiency through adopting energy management practices depends on the size of the firm, production type, energy intensity, degree of production automation and previous emphasis on energy efficiency in the organization [6]. In a study about energy efficiency in Swedish manufacturing firms, the authors [5] show that the potential for improving energy efficiency through more efficient technologies was evaluated to be 5% to 13% and the potential for improving energy efficiency through increased energy management practices was found to be 13% to 20%. "Cost-effective ways to improve energy efficiency in the economy are to combine investments in energy-efficient technologies with the promotion of good energy management practices" [6].

3. ABOUT ISO 50001 STANDARD

The first standard for energy management system was published in Ireland in 2005, by the National Standards Authority of Ireland; with the reference IS 393:2005. This standard was applied in Ireland, Denmark and Sweden. The positive experience of Ireland, Denmark and Sweden with the energy management system has resulted in the adoption of a European energy management standard, EN 16001 [32]. In 2009, CEN (European Committee for Standardization) adopted a European standard EN 16001, and in 2011 the ISO (International Organization for Standardization) has adopted an international standard for the energy management system, ISO 50001.

In 2007, the UNIDO (United Nations Industrial Development Organization) held a meeting, whose topic was the climate change. The meeting was attended by representatives of the ISO and representatives of countries which have already adopted standards for energy management. The conclusion of the meeting was to force the ISO to start working on the development of a standard for energy management. In 2008, the ISO has formed a project committee ISO/PC 242 with an aim to develop this standard. 59 countries were involved in the development of the standard, including the U.S. Department of Energy. After four sessions, on June 17, 2011 the standard ISO 50001 was published.

Publication of this standard was followed by the publication of the drafts of standard series for energy management: ISO/CD 50004 (Guide for implementation of energy management system), ISO/CD 50015 (Measurement of the energy performance of the organization), ISO/CD 50003 (Requirements for audit and certification bodies), ISO/CD 50006 (Energy baseline and indicators), ISO/DIS 50002 (Energy review) and others [23].

The purpose of the ISO 50001 standard is to enable organizations to establish the systems and processes necessary to improve energy performance, including energy efficiency, energy use and energy consumption. This standard leads to a reduction in emissions of greenhouse gases and other environmental impacts and energy costs, through systematic management of energy. The standard can be applied to all types and sizes of organizations irrespective of geographical, cultural or social conditions. Successful implementation depends on all organization levels and functions commitments, and especially top management commitment.

The standard specifies requirements for the energy management system, which an organization can use as reference in the development and implementation of energy policy and in the developement of general and specific objectives and action plans, which take into account legal requirements and information about significant energy use. A significant advantage of this standard, as compared to other management systems standards, are the specific financial benefits that can be seen in a short time after the implementation of an energy management system.

4. ENERGY MANAGEMENT SYSTEM CERTIFICATION IN THE WORLD

Generaly speaking, there are not many certified energy management systems in comparison with the certification of other management systems (in accordance with standards ISO 9001, ISO 14001, OHSAS 18001, ISO 22000, etc.). According to the ISO certification survey (ISO, 2012), there are

about four times more ISO 50001 certificates in 2012, than in 2011 in the world. In both years, most of the certificates were issued in Europe. In 2011, the least number of certificates were issued in Africa (there were no certificates, actually). In 2012, the least number of certificates were issued in North America.

In Europe, Germany is the leader in the number of ISO 50001 certificates issued. The second leading country, Spain, has about ten times fewer certificates than Germany. In their survey about the ISO 50001 certification, the ISO notes that there are new coming countries in the ISO 50001 certifications. These are the following countries: in Africa (Egypt, Ethiopia, Malawi, Mozambique, South Africa, Tanzania, Uganda, Zambia), in Central and South Europe (Argentina and Chile), in Europe (Belgium, Bulgaria, Croatia, Hungary, Ireland, Netherlands, Serbia, Slovakia, Macedonia, Ukraine), in East Asia and the Pacific area (China, Macau, Malaysia, Philippines, Singapore, Vietnam), in Central and South Asia (Kazakhstan) and in Middle East (Iran and Saudi Arabia).

In Europe, there were about five times more ISO 50001 certificates issued during 2012, than in 2011. In 2011, Spain had the most certificates issued, but Belgium, Bulgaria, Croatia, Hungary, Ireland, Netherlands, Serbia, Slovakia, Macedonia and Ukraine had no certificates. In 2012, Germany had the most ISO 50001 certificates issued, and Bulgaria, Slovakia and Turkey had only one certificate each issued (ISO, 2012).

5. PREPARATION FOR ENERGY MANAGEMENT SYSTEM CERTIFICATION OF AN ORGANIZATION

Complete engineering activities in order to prepare the organization's energy management system for certification, according to ISO 50001 standard, are carried out in accordance with the activities listed in the project plan. Before starting the project, it is necessary to get an insight into all the processes in orgnization which need to be documented. We can use the following methods:

- The initial review of the organization and the review of realization of processes in the organization, in terms of energy efficiency and energy management,
- The review and analysis of processes which an organization realizes, with special emphasis on the application of energy management requirements,
- The analysis of existing documents that specify the processes which need to be documented, with special reference to the documents that consider energy management and energy efficiency,
- Staff training about the application of the ISO 50001 requirements, in the respective organization,
- Consideration of the legal and technical regulations which relate to the organization's operations, as well as current and future obligations in terms of energy management,
- Interviews with responsible persons (direct interview and/or obtaining answers to questions),
- Creatinon of draft documents,
- Harmonization and joint adoption of created draft documents,
- Drafting and promulgating the final versions of the documents.

5.1. PLAN OF PROJECT ACTIVITIES

The basis for the beginning of implementation of an energy management system is the recognition of its role in the organization and employees' involvement in the promotion of these ideas and presenting ideas to the top management. Employees should prepare the data and analysis that they will present to top menagament, to get their support for the project. All benefits of the energy management system should be prepared and presented to top management in a way understandable by the top management. This is the "language of money". After receiving the support from the top management, a plan for realization of the project should be prepared, with defined responsibilities, resources, milestones and timelines.

Project planning involves a definition of required time frame for the implementation of the energy management system and the development of a Gantt chart. The required time depends on the complexity and scope of

the energy management system. On average, the implementation of energy management system lasts between one and two years. However, if the organization has already implemented any of the management systems according to the ISO 9001 or ISO 14001, the time needed for the implementation can be significantly reduced. The plan is a "live" document and can be updated when needed.

Project planning includes the establishment of a communication channel. Communication is the key to a successful implementation of the project. As part of the implementation of energy management systems plan, meetings within the team should be defined in the plan, as well as meetings with representatives of the top management. Meetings should include monitoring results of the project and the decision-making processes, which should be followed by reports from the meetings. He top management also needs to inform the project team if there are any changes that may affect the project.

The project plan envisages the following activities in the preparation for energy management system certification of an organization:

1. **Engagement of consultants** - This activity is not obligatory. The organization may decide to independently realize the project, if they have the necessary human resource capacity.
2. **Formation of the project team** - Setting up a group that is responsible for the implementation of an energy management system according to standard ISO 50001 in an organization (the project team usually consists of consulting team - if the consultants are involved in the project, and members of the working team, consisting of the representatives of organizations). When setting up the project team, team define ways of communication within the team, between the team and the top management, as well as the schedule and frequency of team meetings.
3. **Staff training** - Training of personnel in the organization is carried out with the aim of full understanding, acceptance, efficient operation, implementation and adoption of the implemented energy management system according to the ISO 50001 standard. Training usually consists of seminars about the requirements of the ISO 50001 standard series, with consideration of the legal and technical regulations which relate to organization's operations, as well as current and future obligations in terms of energy management, and staff training for the practical use of the created documents (this part of the training is carried out successively during the project).
4. **The initial status check („snapshot")** - This project activity involves the identification and a detailed analysis of the current situation in the energy management system basis, in relation to the requirements of the ISO 50001, which serves as the basis for the preparation of a detailed project plan and program. For the purpose of realization of a "snapshot", a checklist based on the requirements of the ISO 50001 is made. The organization defines the scope of its energy management system, identifying areas of use (buildings, locations, departments, or any part of them), and identifies the system boundaries (physical or organizational constraints, which include defined processes, equipment, departments or other elements). Practically, it is necessary to define what energy management system includes and what it does not include. The area of application is usually related to the activities being undertaken, and the limits of the system with its physical locations (according to the ISO/CD 50004 standard). Through the "snapshot", the initial energy audit is realized. Energy audit is a systematic inspection and analysis of energy use and energy consumption of a system or organization with the object of identifying energy flows and the potential for energy efficiency improvements (according to the EN 15900 standard) . An energy audit is an important step for an organization, whatever its size or type, if the organization wants to improve its energy efficiency, reduce energy consumption and bring related environmental benefits (according to the EN 16247-1). Energy audit aims to collect the updated data and form the "energy profile" of the organization. For an effective energy audit, it is necessary to

analyze energy usage and energy consumption, based on measurements and other data, ie. identify current sources; evaluate past and present energy consumption and energy use; based on analyzing the energy use and energy consumption, identify areas of significant energy use, ie. identify the facilities, equipment, systems, processes and personnel that significantly affect the energy use and energy consumption; identify other relevant variable factors that significantly affect the use of energy, determine the current energy performance of facilities, equipment, systems and processes, to assess the future energy use and energy consumption; identify and prioritize the improvement of energy performance (according to the ISO 50001 standard) .

5. **Development of detailed plan and programe** – Developement of a detailed plan and program of energy management system implementation in an organization, according to the ISO 50001 standard, is carried out by listing the names of documents which need to be created and terms of their creation, in the form of a Gantt chart.
6. **Creation of documents** – This activity includes the creation of documents which support the implementation of energy management system, for the following types of documents:
   - Reengineering of ethe xisting documentation in other management systems (if the organization has an implemented integrated managment system or one of them), in terms of synchronization with the requirements of the energy management system. The existing documentation may be: the management system manual, the management system procedure for identification of legal and other requirements, the procedure for training and development of employees, communication procedures, procedures for the design and management of documents, procedures for emergency response, the procedure for evaluation and selection of suppliers and subcontractors, the procedure for measurement of equipment management, the procedure for internal audits, procedures for corrective and preventive actions, the procedure for records management, the procedure for management review, and so on.
   - Specific documents for workflows in the organization, which must comply with the requirements of the ISO 50001 standard, as well as documents relating to the implementation of the specific requirements of the ISO 50001 standard. Specific documentation may be: records of the involvement of energy performance in the long-term planning, energy policy, the procedure on energy planning, the initial energy review report, the decisions about energy baseline (according to the standard EN 15900, baseline is the calculated or measured energy consumption over a period of time normalized by adjustment factors), procedures for monitoring energy performance indicators, targets and action plans for energy management, procedures for management of operations which have a significant impact on energy performance, records of identifying energy performance which are important for the design and modification of facilities, the procedure for monitoring and measuring indicators of the energy management, the plan for measuring the energy consumption, and so on.
7. **Review and approval of documents** - This project activity includes verification of draft documents and their approval by the project team.
8. **Choosing a certification body** – This project activity includes establishing contact with an accredited domestic or international body for certification of energy management systems (certification body).
9. **Pre-sertification audit** – This project activity includes an audit of implemented energy management system in the organization, a prior request for certification is submitted to the certification body. Tthis audit is conducted by the project team.
10. **Corrective action** - This project activity includes the implementation of necessary corrections of elements in the energy management system, in order to achieve compliance with the ISO 50001 standard.

11. **Corrective actions which need to be fixed for certification** - This project activity includes eliminating nonconformities that are eventually found by the certification body during the process of certification.

5.2. ALLOCATION OF PROJECT RESPONSIBILITIES AND PROJECT TIME

If involved in the project, the consulting team conduct the following activities:

- "snapshot" of organization, based on the requirements of the ISO 50001 standard, with a prior participation in a joint perception and analysis of processes which an organization realizes, with special emphasis on the application of energy management requirements,
- developing a project plan with the optimal list of documents in the energy management system required for the relevant organization,
- creation of general an specific documents required by the ISO 50001 standard,
- training of staff who will apply the documents in an organization, through the process of document creation and process of preparing for certification,
- verification of created documents application, through the realization of pre-certification audit in the organization,
- help in fixing nonconformities and an eventual implementation of corrective actions requested by certification body during the assessment of the energy management system in the organization.

The responsibilities of the organization project team are as follows:

- participation in the joint perception and analysis of processes that an organization realizes, with special emphasis on the application of requirements of the energy management system,
- active participation in the consideration of the legal and technical regulations as regards the organization's operations, as well as current and future obligations in terms of energy management,
- review and approval of created general and specific documents of the energy management system, required by the ISO 50001 standard,
- actively participate in the re-engineering of the existing management system documentation, in terms of its synchronization with the requirements of energy management,
- application of created documents for energy management system.

The estimated duration of the project of analysis of processes that an organization realizes, with a special emphasis on the application of energy management system requirements, the creation of documents which are provided in the project plan, and preparing the organization for certification is between one and two years. If an organization has implemented an integrated management system, the deadline for this project is approximately 5 months.

The duration of the project depends on the readiness of the organization to meet the defined obligations, accept and apply the created document for the energy management system. In this regard, the project deadline can be partially corrected.

6. CONCLUSIONS AND FUTURE WORK

Unlike other management systems, an energy management system is a system whose effects of implementation can be seen in a very short time. What is more important for the top management is that effects of energy management system standardization are clearly visible and can be expressed in financial indicators.

Because the ISO 50001 standard is a relatively new standard, certification in accordance with its requirements is not widespread, both in the world and in Serbia. In Serbia, there are only three certified organizations, in accordance with the requirements of the ISO 50001 standard. Energy management systems are interesting mainly for large corporations, which are large consumers of energy, and already have integrated management systems.

In our future work we will deal with a more detailed analysis of the energy management system certification in various industries and with a specificity of preparing for certification of energy management systems, depending on

the industries and activities which the organization realizes.

REFERENCES

[1] Abbasi, G. Y. & Al-Mharmah, H. (2000) Project management practice by the public sector in a developing country. International Journal of Project Management, 18(2), 105-109

[2] Abdelaziz, E.A., Saidur, R. & Mekhilef, S. (2011) A review on energy saving strategies in industrial sector. Renewable and Sustainable Energy Reviews 15, 150–168

[3] Ackoff, R. (1970) A concept of corporate planning. Long Range Planning, 3(1), 2-8

[4] Ajmal, M. M. & Koskinen, K. U. (2008) Knowledge transfer in project-based organizations: An organizational culture perspective. Project Management Journal, 39 (1), 7-15

[5] Backlund, S., Broberg, S., Ottosson, M. & Thollander, P. (2012) Energy efficiency potentials and energy management practices in Swedish firms, ECEEE 2012 summer study on energy efficiency in industry

[6] Backlund, S., Thollander, P., Palm, J. & Ottosson, M. (2012) Extending the energy efficiency gap, Energy Policy, Volume 51, December 2012, pp. 392–396

[7] BizEE Software Ltd (2013) www.bizeesoftware.com

[8] Bryde, D. J. (2003) Project management concepts, methods and application. International Journal of Operations & Production Management, 23 (7), 775-793

[9] Chaffey, N. (1997) Get your organization fit for project delivery – build a projects culture, Project, October, pp. 10-12

[10] Christoffersen, L.B., Larsen, A. & Togeby, M. (2006) Empirical analysis of energy management in Danish industry. Journal of Cleaner Production 14 (5), 516–526

[11] Cleland, D.I. (1994) A personal perspective of MPM, Project Management Journal, Vol. 25 No. 1, pp. 6-7

[12] Crawford, L. (2006) Developing organizational project management capability: theory and practice. Project Management Journal, 37(3), 74-97

[13] EN 15900:2010 Energy efficiency services. Definitions and requirements

[14] EN 16247-1:2012 Energy audits. General requirements

[15] Energy Office (2013) www.energyoffice.org

[16] Firth, G. & Krut, R. (1991) Introducing a project management culture, European Management Journal, Vol. 9 No. 4, pp. 437-43

[17] Gareis, R. (1992) Management of networks of projects, AACE Transactions, Vol. J, pp. J.1.1-J.1.6

[18] Gordić, D., Babić, M., Jovičić, N. Šušteršič, V., Končalović, D. & Jelić, D. (2010) Development of energy management system – Case study of Serbian car manufacturer, Energy Conversion and Management, Volume 51, Issue 12, December 2010, pp. 2783–2790

[19] International Organization for Standardization (ISO) (2012) The ISO Survey of management system standard certifications – 2012, http://www.iso.org/iso/iso-survey

[20] ISO 50001:2011 Energy management systems - Requirements with guidance for use

[21] John, C. (2004) Maximizing energy savings with enterprise energy management systems. In: IEEE Power & Energy

[22] Jovanović, B. & Mijatović I. (2013) Razvoj standarda u oblasti energetske efikasnosti, Časopis Saveza inženjera i tehničara Srbije "Tehnika", oktobar 2013., ISSN 0040-2176, UDC: 62(062.2)(497.1), year LXVIII 2013., subcollection „Kvalitet – IMS, standardizacija i metrologija", ISSN 2334-7368, year 13-2013., no. 5, pp. 983-990

[23] Keil, M., Mixon, R., Saarinen, T., & Tuunainen, V. K. (1995) Understanding runaway IT projects: Results from an international research program based on escalation theory. Journal of Management Information Systems, 11(3), 67–97

[24] Kerzner, H. R. (2013) Project management: a systems approach to planning, scheduling, and controlling. Wiley

[25] Lappe, M. & Spang, K. (2013) Investments in project management are profitable: A case study-based analysis of the relationship between the costs and benefits of project

management. International Journal of Project Management

[26] Lee, S.-K., Teng, M.-C., Fan, K.-S., Yang, K.-H. & Horng, R.S. (2011) Application of an energy management system in combination with FMCS to high energy consuming IT industries of Taiwan, Energy Conversion and Management, Volume 52, Issues 8–9, August 2011, pp. 3060–3070

[27] Lenfle, S. (2008) Exploration and project management. International Journal of Project Management, 26(5), 469-478

[28] Maylor, H. (2001) Beyond the Gantt chart: project management moving on, European Management Journal, Vol. 19 No. 2, pp. 92-100

[29] McLain, D. (2009) Quantifying project characteristics related to uncertainty. Project Management Journal, 40(4), 60-73

[30] Mizuta, Y. (2003) A case study on energy saving and new energy services in Japan, Management of Environmental Quality: An International Journal, Vol. 14 No. 2, 2003, pp. 214-220

[31] Rezessy, S. & Bertoldi, P. (2011) Voluntary agreements in the field of energy efficiency and emission reduction: Review and analysis of experiences in the European Union, Energy Policy 39, 7121–7129, 2011

[32] Simon, H. A. (1960) The new science of management decision, Prentice-Hall, New York

[33] Swords, B., Coyle, E. & Norton, B. (2007) An enterprise energy-information system. Applied Energy 85, 61–69

[34] Tavares, L. V. (2002) A review of the contribution of operational research to project management. European Journal of Operational Research, 136(1), 1-18

[35] Thollander, P. & Ottosson, M. (2010) Energy management practices in Swedish energy-intensive industries. Journal of Cleaner Production 18 (12), 1125–1133

[36] Van Dijk, T A. (1997). The study of discourse. In T A. van Dijk (Ed.) Discourse as structure and process—Discourse studies: A multidisciplinary introduction. London: SACE Publications Ltd.

MONITORING AND MEASUREMENT IN MANAGEMENTS STANDARDS – ASPECTS AND PRACTICAL EXPERIENCES –

Radoslav Raković - *Energoprojekt Entel, Belgrade*

Abstract: Management system standards (MSS) related to management systems within an organization's Integrated Management System (IMS) ask that Key Performance Indicators (KPI's) be defined in order to enable monitoring and mesurement of effectivenes of the standard implementation within the organization as well as within particular projects. Unfortunately, standard requirements are not followed by instructions how to define these KPIs and organizations are left to their own means. Of course, consultants can help, but usually they have no sufficient level of knowledge of organization's business processes. In this paper, some aspects and practical experiences related to this problem in particular organization are presented.

Key words: Integrated Management System (IMS), Key Performance Indicators (KPIs), Management system standards (MSS), Monitoring and measurement, Project Management, Polling technique.

1. INTRODUCTION

An Integrated Management System (IMS) is a management system within an organization which integrates all particular management practices into one coherent system. Of course, the character and the total number of management systems within IMS depends on business activities of a particular organization, as well as its determination to which segments of IMS will give priority. As a rule, the Integrated Management System includes the following management systems:

- Quality Management System - QMS (ISO,2008)
- Environmental Management System - EMS (ISO,2004)
- Occupational Health and Safety Management System - OHSAS (BSI,2007)
- Information Security Management System - ISMS (ISO,2013)
- Food Safety Management System - FSMS (ISO,2005)
- Risk Management - RM (ISO,2009)
- Energy Management System - EnMS (ISO,2011) etc.

Officially, there is no standard for IMS - particular management systems have been developed relatively independently of one another, and have been defined by particular international standards (BSI,2007; ISO,2004; ISO,2005; ISO,2008; ISO,2009; ISO,2011; ISO,2013a). These standards have certain common elements which can be managed in an integrated way as well as certain specific elements for particular management systems asking for a specific approach and activities. The process of integration is based usually on guidelines (BSI,2012), Figure 1 - although there are differences among component management systems within IMS, they are established and applied within the organization which is indivisible and these differences enable to express all specifics of a particular organization as accurate as possible.

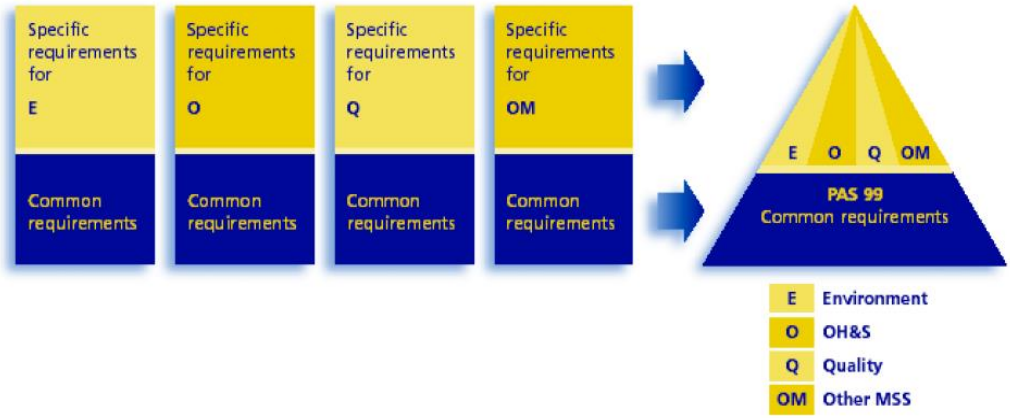

Figure 1: Principle of management systems' integration (BSI,2012)

In the next several years additional efforts are necessary to help the process of integration. The ISO Guide 83 revised in 2011 as guidelines for the "standardization of standards" , was replaced by directives (ISO,2013b). In comparison with the guidelines, the directive represents a document whose application is mandatory, and it is expected that all ISO management system standards (MSS) will have harmonized structures in the future several years.

2. MONITORING AND MANAGEMENT WITHIN MSS

Generally speaking, the purpose of the requirements related to monitoring and measurement in all management system standards is to determine the extent to which applicable requirements are being met. As a rule, it includes recording of information to track performance of relevant operational controls related to processes and/or products and evaluating of conformance with the organization's or project objectives as well as the ability of the processes to achieve the planned results.

Within the quality management system (ISO,2008), a particular subsection 8.2 is devoted to monitoring and measurement. Particular attention is paid to customer satisfaction, internal audit, monitoring and measurement of processes (item 8.2.3) and products (item 8.2.4), as a pre-condition for continual improvement based on corrective and preventive actions.

Other management systems have a slightly different approach. Within the planning process these standards pay particular attention to aspects, evaluation of compliance with legal requirements (legal framework), identification of hazards, impacts, risk assessment and risk management, as well as programs for attaining objectives, and the central issue within implementation process is the operational control, readiness for emergency situations as well as incident investigation.

The standards for environmetal and occupational health and safety management (ISO,2004; OHSAS BSI,2007) have an identical structure and consider the topics of monitoring and measurement within item 4.5.1, with the main idea to monitor and measure the key characteristics of operations that can have a significant impact on environment (EPIs, i.e. KPIs related to environment) as well as on occupational health and safety.

The standard for energy management (ISO,2011) requires the organization to identify EnPIs (KPIs related to energy management) appropriate for monitoring and measuring its energy performance (item 4.4.5, constituent part of the planning process) and insists to monitor the key characteristics of operations, to measure and analyse them at planned intervals (item 4.6.1)

The newest revision of information security management standard (ISO,2013a), fully harmonized with the Directive, annex SL (ISO,2013b), considers monitoring, measurement, analysis and evaluation within subsection 9.1 with an emphasis on information security performance and effectiveness of the ISMS as a whole. The main part of this standard is the Statement of applicability, the statement of an organization related to each of 113 controls, grouped into

14 groups and 35 control objectives. Some of these controls are technical, some organizational, and some have to take into account both aspects. From this point of view, the ISMS standard is significantly different in comparison with others.

The standard for food safety management (ISO,2005), similarly to the quality management standard, considers specified monitoring and measuring methods and equipment that enable the performance of monitoring and masuring procedures. The emphasis of this standard is based on two concepts - Hazard analysis and control of critical points (HACCP) and operational prerequisite programmes (PRPs) as a minimum assumption for the implementation of the system.

As a general framework for risk management, the standard (ISO,2009) considers monitoring and review both in the framework segment (subsection 4.5) and the risk treatment segment (subsection 5.6).

From the above review we can see that the subject of monitoring and measurement is more or less recognizable within the MSS in different subsections and items. In such conditions, it is very difficult for organizations to recognize how to apply these standards' clauses, even in case of one standard, let alone several of them.

In spite of differences among several management system standards, there is one very important element for its application within the organization - management commitment. The main assumption of all management standards is that top management of the organization is fully responsible for establishing and implementation of these systems as per adequate standards. This role is not possible to be transferred to anybody at the lower level of organization. Standards need to define responsibility and authority for all activities and processes, to supervise all these processes by a management representative (in FSMS standard term "food safety team leader" is used instead) and periodical management review (usually once a year) is foreseen to perceive the actual status and to make decisions for the future. From this point of view it is very important to have adequate key performance indicators related to business processes within the organization, because the quality of KPIs will have a direct impact upon the quality of decisions, and sometimes upon the survival of the company on the market.

3. ESTABLISHING IMS IN ENTEL

It is well known that standards related to management systems are "generic", prepared as "key for all locks". It means that the same standard can be applied to any organization, large or small, whatever its product or service is, in any sector of activity etc. From this point of view it is clear that details should be presented only in case of a particular organization, and that these experiences are (not) possible to be applied to others, as a general approach.

It is especially difficult to define parameters for monitoring and measurement in case of organizations whose products are not "tangible" in a classical sense. In such conditions, particular attention should be paid to defining of parameters to be monitored and measured to enable monitoring of process and/or product performances as realistically as possible, analysis based on the data collected from the business processes and improvement of these performances. One example of this type of organization is Energoprojekt Entel p.l.c. from Belgrade, Serbia (hereinafter called: ENTEL).

The core business of the company is Engineering Design and Consultancy Services related to Projects in the fields of Energy, Water, Telecommunications, Environment protection and Project Management. Categories of ENTEL's products are design documentation (studies, tenders and technical documents), provision of consultancy services and occasionally customer's specific software development.

The IMS in ENTEL has been established "step by step" (Raković,2012). In the first step, in December 2001, the Quality Management System (QMS) as per ISO 9001, certified by Lloyd's Register Quality Assurance (hereinafter called LRQA) was established. Within the first three-year certification period the project of the QMS re-engineering had been implemented based on project principle and "breakthrough" with its own i.e. without engagement of any consultant company, thanks to the personnel

structure of the company (Raković,2007). The duration of this project was 10 months, it was based on the results of internal and external audits, suggestions of employees and summarized practical experiences in the application of the quality management system. The project was coordinated by the Head of QMS department as project manager and main people from several organizational units have been included and their engagement was tretaed as engagement at the best paid external contract. As a result, all documents of the system were harmonized and updated. During the fist two three-years certification cycles the emphasis was on a consistent performing of quality management system in accordance with the specifics of the company, with a main idea to establish a basis form expanding the system with other management systems.

Establishing of the Integrated Management System (IMS) was started during the third certification cycle, by establishing of Environmental Management System, as per standard ISO 14001 and its certification in the middle of the 2009. Three areas i.e. groups of aspects, in which ENTEL has impact on environmental protection have been identified - design documets preparation, construction supervision and business building. Further improvements of the IMS continued at the end of 2010. by establishing the Occupational Health and Safety Management System, as per BS OHSAS 18001. The certification of this management system originated from activities related to occupational health and safety topic based on legal requirements issued several years ago that created a fully new approach, with new responsibilities for both employers and employees. As per these regulations, five groups of working places are identified (ENTEL,2012) - administrative / technical jobs in business building (management, designers), administrative / technical jobs in projects i.e. construction supervision, driver of motor vehicle and jobs within the kitchen.

Based on the fact that significant part of ENTEL's business activities is carried out within the energy sector, it was natural to establish an energy management system as per appropriated management standard. In the first step, ENTEL certified its energy management system as per European standard EN 16001 in the middle of 2011, and transferred it to the ISO standard in the middle of 2012. During 2012 ENTEL established the Information Security Management System as per the standard ISO 27001 and certified it in November 2012 by LRQA. The decision to establish ISMS is based on the fact that information and communication technologies play a very important role in ENTEL's activities, with all positive and potentially negative consequences that it may have and that information protection is very important for the organization that works in the conditions of market competition.

4. CASE STUDY: KPIs IN ENTEL IMS

The List of Key Performance Indicators (KPI) monitored in ENTEL is given in Table 1 (ENTEL, 2013). The table shows the results for parameters in the four-year period, 2009-2011 and 2012 as a year that is a period of management review.

Table 1: List of KPIs

Parameter	Parameter description	Declared value	Reached value
K_1 ISO 9001	Ratio of number of spent and planned resources as per basic planning document of project	< 1,00	2012: 0,69 2009-2012: 0,83
K_2 ISO 9001	Ratio of resources spent for corrections after validation and total number of resources spent for design implementation	< 1,5%	2012: 1,33% 2009-2012: 1,22%
K_3 ISO 9001	Number of designs without comments during verification and total number of designs considered by the Expert council (verification body)	>40%	2012: 41,6% 2009-2011: 44,2%
K_4 ISO 9001	Number of comments per design that have comments during verification	< 2,5	2012: 2,23 2009-2012: 2,41
K_5	Participation of costs for competence	>0,25%	2012:0,26 %

ISO 9001	improvement within total income		2009-2011: 0,28%
K_6 ISO 14001	Paper consumption per unit of product	Decreasing for 5% in comparison with previous year	2012: 8,25% decreasing in comparison with 2011
K_7 BS 18001	Number of injuries that cause absence from work of more than three working days	0 („zero“ tolerance)	2012: 0 2009-2012: 0
K_8 BS 18001	Participation of overtime work in total engagement	< 2,5 %	2012: 2,22% 2009-2011: n/a (new parameter)
K_9 ISO 50001	Average fuel consumption per car / 100 km	Decreasing for 5% in comparison with previous year	2012: 8,91l/100km 2009-2011: n/a (new parameter)
K_{10} ISO 27001	Number of attacks from the outside that can breach the system up to the level of causing undesired consequences during the year	0 („zero“ tolerance)	2012: n/a (new parameter)

These indicators per groups and standards are as follows (Raković,2007; Raković,2011; Raković,2012):

a) Technology process performance, ISO 9001

- Spent and planned resources (K_1):
  Represents the ratio of resources (for example man-months) spent during the project realization reported within a finished project report and resources planned and approved in the baseline document. The number of resources spent includes resources spent up to the delivery of the product as well as resources spent for corrections of the product after validation. The main aim is that this ratio be $K_1<1$
- Resources spent after validation (K_2):
  The ratio of resources spent for corrections after validation (for correction of always delivered product) and resources spent for design preparation. Resources spent for correction after validation are related to the ones spent for corrections as per accepted comments of the Customer Expert Council or Revision committee of the authorized Ministry, which are within the scope of Terms of Reference (ToR). These spent resources, recalculated to the money, represent the cost of "non-quality". The value of this parameter is set to the value of 1.5% and it is subject to continual monitoring and review

b) Product performances, ISO 9001

- Designs without comments during verification (K_3):
  Represents the ratio of number of designs without comments during verification before delivery and a total number of designs prepared. As per ENTEL IMS, each product is reviewed by the quality inspection (QI) engineer during preparation and verification is carried out by the IMS department and the Expert Council that approves its delivery. This parameter enables the IMS department to monitor activities and work of QI engineers (they are "joint members" of the IMS department, although they are officially working within technical departments). This parameter has been set to be $K_3>40\%$;
- The average number of comments per total number of designs with comments (K_4):
  It was declared to be $K_4<2,5$. The comments (nonconformity) types have meanings, as follows:
  A-Deviation from instruction for Technical documents – general part
  B-Deviation from instructions for accompanying Technical documents
  C-Deviation from instructions for Technical Documents preparation
  D-Design non-completeness
  E-Other nonconformities.

Based on this parameter monitoring, PARETO analysis is made to conlude which of non conformities is dominant and to

which of them corrective action should be oriented. A typical example of PARETO analysis for 2012 is shown in Figure 2. It can be concluded that Type C of nonconformity is a dominant one.

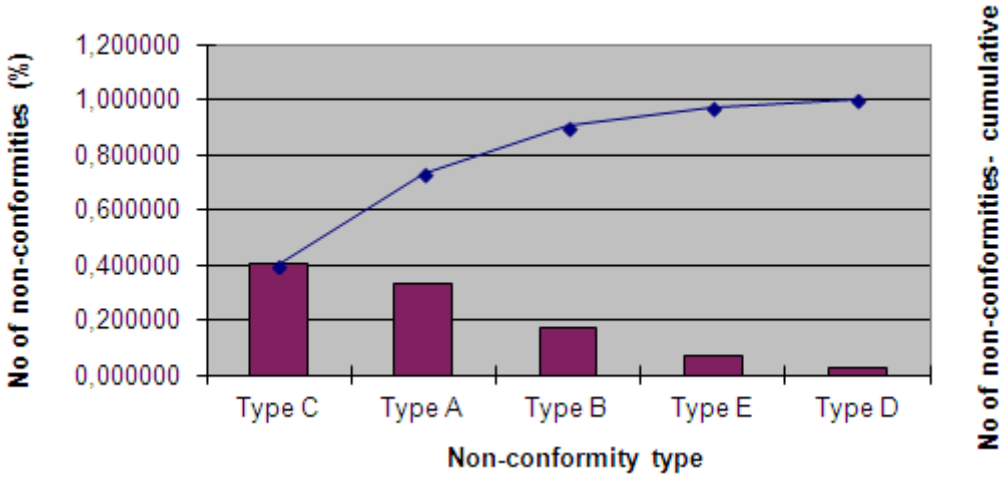

Figure 2: PARETO Analysis of non-conformities in 2012.

c) Support processes, ISO 9001

- Participation of costs for competence improvement within total income (K_5):
  Financial parameter related to competence, because ENTEL is a consulting company, with high participation of human resources. The parameter has been declared to be K_5>0,25%.

d) Environmental protection, ISO 14001

- Paper consumption per unit of product (K_6):
  The ratio of total quantity of paper spent within a year (recalculated to number of reams of A4 paper) and the number of designs approved for delivery during this year as per decision of the Expert council as verification body. It is declared to decrease consumption for more than 5% in comparison with the previous year. The parameter connects to aspects - financial, because of decreasing in costs and environmental protection, since the production of paper is directly related to felling of trees. It is necessary to mention that ENTEL has established internal system of "paperless communication" since 2007.

e) Occupational health and safety, BS 18001

- Number of injuries that cause absence from work for more than three working days (K_7):
  The value of this parametre is declared to be "0" i.e. "zero tolerance". This determination is based on the fact that in ENTEL there are no working places with a raised level of risks. The company is predominantly responsible for office conditions of work, because occupational health and safety measures at sites during construction supervision represent the responsibility of the main contractor.
- Scope of overtime work (K_8):
  This parameter represents the participation of overtime work within the total engagement of employees during the year. This parameter has been established during 2012 to enable monitoring of the scope of overtime work as a situation typical for ENTEL conditions of work. It is not possible to avoid it completely because of the fact that engagement of people per projects is not full from the beginning as per lack of sources of information. It was declared to be maximum 2,5%.

f) Energy efficiency, ISO 50001

- Fuel consumption (K_9):
  This parameter, based on the mechanism of monitoring fuel consumption per car, has been established during 2012. It is meant to decrease the consumption for more than 5% in comparison with the previous year (limitation of speed, more rational use of air condition and heating etc).

g) Information security, ISO 27001

- Number of attacks from the outside that can breach the system (K_{10}):

The number of attacks from the outside that can breach the system up to the level of

causing undesired consequences during the year. The parameter has been established during 2013 and its value was declared to be "0" , i.e. "zero tolerance".

It is very important to emphasize that key performance indicators K_1 to K_4 directly originate from the implementation of projects within ENTEL and give insight into the quality of the project management process. The main objectives of this process are to finish activities within the project budget (K_1 < 1) and with acceptable level of quality of delivered product to client (i.e. to keep cost of "non-quality" within declared limits, K_2 < 1,5%). To ensure achieving these objectives, the project quality manager is appointed at the level of each project, as well as quality inspection engineers per particular specialties (product review, as per the ISO 9001standard). Their activities are supervised by the IMS department and the Expert council (verification body, as per the ISO 9001 standard) before product delivery and it is illustrated by key performance indicators K_3 and K_4 - quality inspection engineers have an obligation to monitor project activities from the very beginning (not only at the end) in such a way that at least 40% of products have no any remarks in the verification process (K_3 > 40%) and to limit the number of remarks for other products to an acceptable level. It means that the main "horizontal" process of product realization (as per process model of QMS embedded into ISO 9001) is monitored by 4 of 10 KPIs defined in ENTEL so far.

Other 6 KPIs (K_5 to K_{10}) are related to "vertical" i.e. supporting processes. The people represent a very important resource of ENTEL, their education level, experience, continual competence improvement etc. have a decisive role both in the processes of marketing, bidding and contracting and planning as well as in implementation of projects, monitoring and reporting, up to project closing and making conclusions for future activities ("lessons learned"). This aspect is monitored by KPI K_5. The approach of people to environmental protection, occupational health and safety, energy management as well as information security topics is monitored via indicators K_6 to K_{10}. Continual improvement, as principle of quality management and all other management standards are fully applicable to the process of KPIs defining, monitoring and change. All people should be aware that this job is not possible to finish - we are trying today to be at least slightly better than yesterday, and the cycle continues forever.

Apart from KPIs presented above, other forms of monitoring and measurement of performances are applied in ENTEL. In distinction from KPIs that represent a more exact method of performance measurement, polling technique as a method of social sciences is applied that is positioned somewhere at the boundary of objective and subjective methods of measurement.

Nine polls of employees related to the IMS documents knowledge in the period October 2004. – May 2013 have been performed. Figure 3 shows the summary results of the polling.

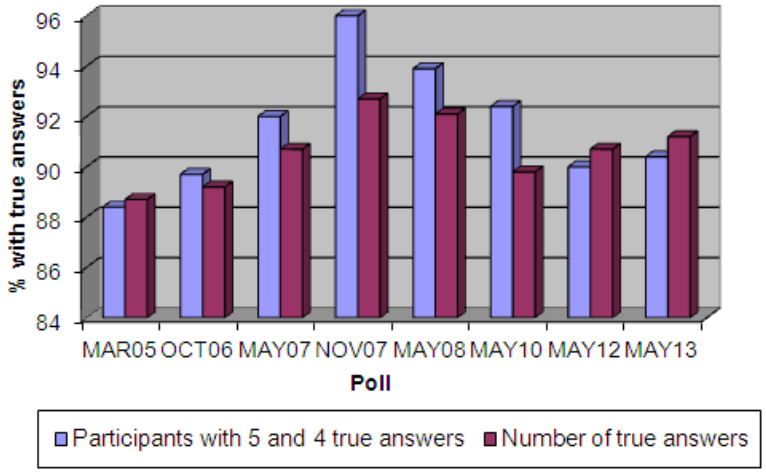

Figure 3: Polling of employees related to IMS documents knowledge – summary results

The task of each employee was to answer 5 questions (with a choice one of three offered answers) related to the contents of IMS documents. The first poll in October 2004 was general, with 50 questions for all employees, and polls from March 2005 to November 2007 with 100 questions were oriented to jobs which the employee carries out. This is a reason why this poll has been omitted from Figure 3. These polls have been taken as a corrective action to increase the level of IMS documents knowledge, and have been continued as a preventive action after elimination of problems to prevent their recurrence. The acceptance criteria for all polls were 5 or 4 true answers.

The structure of questions has been changed since 2005, Table 2 - the first five polls were performed with all questions related to QMS, in 2010 poll questions related to EMS were included, in 2012 questions were added related to OHSAS and EnMS and in 2013 poll questions related to all five standards were included (questions 1 and 2 related to QMS, question 3 to EMS, question 4 for OHSAS or EnMS and question 5 to ISMS).

Table 2: Structure of questions in poll

Poll	QMS	EMS	OHSAS	EnMS	ISMS	TOTAL
March 2005	100					100
October 2006	100					100
May 2007	100					100
November 2007	100					100
May 2008	100					100
May 2010	88	12				100
May 2012	70	12	12	6		100
May 2013	58	12	12	6	12	100

From Figure 3 it is possible to conclude that the results are good – the percentage of success (participants with 5 and 4 true answers) ranges from 88.4% to 96%, and the percent of true answers to questions range from 88.7% to 92.7%. At the same time, two thirds of participants usually have all true answers. After the poll, information for employees was usually prepared with particular attention to questions with frequent mistakes, and it was part of lectures for employees held regularly at least once a year. Findings of both internal and external audits have shown that these polls caused a significant effect to IMS documents knowledge and application.

5. CONCLUSIONS

In this paper, some aspects have been considered related to the implementation of monitoring and measurement requirements from particular management standards within the IMS of an organization. Also, some practical experiences from a particular company were presented. It can be concluded that the implementation of these requirements requires a great effort of the organization to recognize, define and apply the key performance indicators that give relevant information related to the effectivenes of the standard implementation within the organization as well as within particular projects. These indicators are subject of continual monitoring and improvement, as per changes both in environment and organization itself.

REFERENCES

[1] (BSI,2012) PAS 99: *Specification of common management system requirements as a framework for integration* (Publicly Available Specification, BSI, 2012)

[2] (BSI,2007) BS OHSAS 18001: 2007 *Occupational Health and Safety Management Systems – Requirements*

[3] (ENTEL, 2013) IMS Documents of ENTEL

[4] (ISO,2004) ISO 14001: 2004 *Environmental Management Systems – Requirements with guidance for use*

[5] (ISO, 2005) ISO 22000: 2005 *Food Safety Management Systems – Requirements for any organization in the food Chain*

[6] (ISO,2008) ISO 9001: 2008 *Quality Management Systems – Requirements*

[7] (ISO,2009) ISO 31000: 2009 *Risk Management – Guidelines on proinciples and implementation of Risk Management*

[8] (ISO,2011) ISO 50001: 2011 *Energy Management Systems – Requirements with guidance for use*

[9] (ISO,2013a) ISO 27001: 2013 *Information Technology – Security Techniques – Information Security Management Systems – Requirements*

[10] (ISO,2013b) ISO / IEC Directives, Part 1 - *Consolidated ISO Supplement - Procedures specific to ISO, Annex SL: Proposals for Management System Standards* (Fourth Edition, 2013)

[11] Raković R., (2007) *Quality in Project Management* (Građevinska knjiga, Beograd, 2007) - in Serbian

[12] Raković R., (2011)"Project management and quality aspects - principles and practical experiences", Serbian Project Management Journal, Vol 1, Issue 1, 2011, pp 67-80

[13] Raković R., (2012)"Project of IMS establishing in organization - some aspects and practical experiences", Serbian Project Management Journal, Vol 2, Issue 2, 2012, pp 71-82

CONCEPTS AND MODELS FOR PRESENTATION OF PROJECT SUCCESS

Marija Todorović, Dragan Bjelica, Zorica Mitrović
Faculty of Organizational Sciences, University of Belgrade

Abstract: Project success has been widely discussed in the project management literature, but after a literature overview we have established that there is now a consensus reached regarding the project success definition. Numerous studies have explained the project success through critical success factors (CSF) and project success criteria using different aspects (stakeholders satisfaction, organizational objectives, future potential to organization, etc.). This paper provides a summarising review of the main characteristics of those concepts, with their advantages and disadvantages. As a criticism of the list of critical success factors Fortune and White (2006) made a step forward in the development of their approach to critical success factors, presenting a formal system model for the integration of critical success factors. This model points to the interdependences of critical success factors and a dynamic project environment and contributes to a better project success presentation.

Keywords: Project Success, Stakeholders, Project Life-cycle,Value-centred approach, Formal system model.

1. INTRODUCTION

Project success/failure is multifaceted and hard to measure. Over the years, various authors have tried to define what constitutes the project success, however, the only established consensus is that the success of the project is a complex issue. Abdullah and Ramly (2006) and Shenhar et al. (2001) point out that the concept of a project success has different meanings for different participants and recognize that there must be a consensus of all participants in defining the success of a project. Pinto and Slevin (1988a) suggest the following reasons for the ambiguity of the project success concept. The first reason is the lack of a defined and harmonized way of measuring the project success by all participants as the project results vary in effects on different participants. Another reason is that the presented list of critical success factors, as a result of numerous studies, is not consistent and varies in a number of factors, their importance, and thus category. Baker, Murphy and Fisher (1988) cited in (Prabhakar, 2008) concluded that the project complexity, its duration and number of parties involved determine the impact oof participants' satisfaction on the overal project success. Completing the project on time and within the budget has little importance in comparison with poor project results. In addition, the authors point out that the project success reflects exactly the combination of these factors at different stages of the life cycle. Shenhar et al. (2001) cited three reasons for the ambiguity of the success of the project: universal approach to all types of projects, subjectivity in the measurement of success and a limited number of control variables that were used in previous research.
Assessment of the success and efficiency of the completed project is very important, particularly in developing "lessons learned" that can help in the management of the future projects. The focus of most studies of project success is on the dimensions of the project success and factors influencing the project success.

A project is sucessful if overall objectives are achieved, yet project management success is measured against the widespread and traditional measures of performance - cost, time and quality. A project can be viewed as "successful" despite poor project management and vice versa. For example, a project might be delivered late and over budget, yet it might lead to an increase in the capability of the organization to better manage the future projects. Project management cannot succeed unless the project manager is willing to employ the system approach to project management by analyzing those variables to success or failure (Kerzner, 2003).

2. RETROSPECTIVE OF PROJECT SUCCESS PRESENTATION

It can be concluded that some studies have observed the project success focusing only on the time schedule, while other studies have defined success in terms of achieving the objectives in terms of time, budget and performance.

The best known list of critical success factors include factors such as projects mission, support of top management, project schedules, client involvement, staff, technical features, client acceptance, monitoring and feedback, communication and problem-solving. (Pinto & Slevin, 1988a) These authors believe that to assess the project success it is necessary to measure the achieved success after the project completion, which includes benefits and effectiveness of the project from the perspective of project beneficiaries or the organization that runs the project. The same reasoning can be seen in Atkinson (1999).

Studies published in 90s are partially different from those mentioned above. For example. Freeman and Beale (1992) identified, based on the literature review, seven critical success factors, of which the following five are the most frequently represented:

- Technical performance;
- The effectiveness of the execution;
- Project management;
- People development;
- Project appropriateness and achieved results.

The results of a research conducted in 2001 on a sample of 182 project managers indicate the following key dimensions of project success:

- Deadlines, budgets and quality;
- Impact on users;
- The benefit to the organization that runs the project.

Harold Kerzner, one of the most prominent authors in the field of project management today, states that project classification presents the base for defining critical success factors. Focused on models based on values such as the Balanced Scorecard projects can be classified into the following four categories:

- Internal Projects: Projects that are approved to improve efficiency and effectiveness.
- Financial Projects: Projects that are realised for the client to ensure income.
- Projects that are initial for some other future projects: long-term projects that provide future revenue and new projects.
- Projects for clients: Projects to be undertaken not only to achieve financial gain but to create or enhance good relations with clients. They can effectively create losses, but the clients have a higher priority (Kerzner, 2011).

Project success can be defined in relation to these categories:
Internal success includes:

- Adherence to budget, schedule and quality;
- Joint compliance on scope changes included;
- No compromising basic work processes;
- A clear understanding of the objectives;
- Timely approval;
- Project execution without compromising the organizational culture;
- Establishment of permanent internal business processes;
- Mutual respect opinions;
- Search for new opportunities to create new value;

Financial success includes:

- Integration of program and project success into one;
- Respect of ethical principles;
- Compliance with legal regulations regarding financial operations;
- Compliance with legal regulation regarding safety, health and environmental protection;
- Keeping on the same level or increasement of market share;
- Keeping on the same level or improvement ROI, NPV, IRR, payback period, etc.;
- Keeping on the same level or increase in a net operating margin.

The achievement and success of future projects includes:

- Improvement of the commercialization process;
- Highlighting related opportunities;
- Maintaining technical superiority;

- Protection of organizational image and reputation;
- Maintaining knowledge base;
- Retention of prior knowledge and creation of new knowledge;
- Linking the project with long-term strategic goals;
- Distribution of information regarding strategic plans to team members;
- Team members express willigness to work with the project manager again.

The success of projects related to clients includes:

- The fulfillment of promises to customers;
- Creation or enhancement of good relations with clients;
- Focus on client needs from start to finish;
- Improvement of customer satisfaction with respect to the previous period;
- The use of the name of each client as a reference;
- Measurement variance in relation to the best practices regarding customers;
- Building long-term relationships between organizations (Kerzner, 2011).

CSF lists could be found in Cooke-Davies (2002) Judgev and Muller (2005) Ika, Diallo and Thuillier (2012), but the general conclusion is that there is no list of the CSF, which is common for all projects. Fortune and White (2006) have presented the results of 63 publications on this topic, from which we can see that there is only partially compliance present regarding research results about the factors that influence the success of the project.

The most commonly cited factors are: top management support in the organization; established clear and realistic goals, and the existence of an effective plan. 81% of publications lists at least one of these three factors, but 17% of publications lists all three factors. Some of the most cited critical success factors can be described as follows:

- Support of top management. Implies the willingness of the management of the organization or project sponsor to provide the necessary support for continuously carrying out project activities. The greater support it gets, the more authority the project obtains, with power as one of the important items of project success. Engwall (2003) points out the dependence on the project success from the context in which the project is performed. In other words, the success of the project depends on its prestige enjoyed among members of top management, as well as the approval of key stakeholders as regards the procedures and project management.
- Clear and realistic project objectives. Presents a picture of what is to be achieved by project implementation.
- Time schedule of the whole project. It presents a detail of the project activities that are necessary for the project implementation. The plans shows when certain activity should be performed, but it also serves as a basis for resource allocation.
- Good communication/feedback. Communication should be established as an adequate network for the flow of information and data necessary for a successful implementation of the project.
- The client involvement. Implies constant communication, consultation and active listening of the all clients requirements to ensure the later acceptance of the project results.
- The competence of the project team. The project team consists of a small group of people, mostly from different backgrounds and diversity experts and their areas of knowledge will greatly affect the project success. In addition to the knowledge and skills of the team members, it is necessary to build a team spirit in order to create a positive climate that will eventually result in achieving the ultimate goals of the project. Besides the right choice of staff, team memebers need to be trained and improved, and thus raise the competence of the team.
- Effective change management. It represents the ability to deal with unexpected situations and problems that have arisen from the ongoing project work.
- The competence of the project manager. Competencies, skills and capabilities of the project manager determine the ultimate success of the project to a large extent.
- Business orientation as the base of the project. Projects may represent a way for the strategy implementation in the organization, or may be part of the project

portfolio or even programs. This implies that the project execution is under a significant influence of the business climate in the organization.

The CSFs play a role in the process control of business processes and according to Van Veen-Dirks and Wijn (2002) "The control process begins with the identification of CSF." When organizations work in an uncertain environment, and as a result the strategy is assessed on a regular basis, one should consider what such a strategic control system looks like. The Balanced Scorecard can be used as a diagnostic control system, part of which can be used for interactive control. However the CSF makes it possible to define the areas of what leads to success. The outcome of this process should be used as a starting point for the Balanced Scorecard. The advantage of the use of CSF is that the measurement system becomes associated with the environment.

3. DIFFERENT PERSPECTIVE OF PROJECT SUCCESS

Traditionally, the main criteria for the success of the project have been costs, time and quality. However, these criteria have been criticized for many reasons. (Shenhar et al, 2001; Atkinson, 1999; Gardiner & Stewart, 2000) Over the years, there have been various attempts to overcome these inadequacies. These efforts can be grouped into two different approaches: one is to add another dimension to the basic criteria, and other abstraction dimensions.

Norrie and Walker (2004) extend the traditional model of project management adding the fourth element - strategy. Forming a model of the four elements (time, cost, quality and strategy) they have positioned strategy as a key element of project success. In this extended model, the responsibility extends from the project manager to other members of the organization.

According to the second approach, a number of factors that determine the success of the project should be reduced. This approach looks at the traditional criteria of costs, time and quality, and is also incomplete, because the time is a variable in the function of the project cost. In other words, for a given quality, there is a relationship between the time and the cost. As a result, time is the independent variable and should not be used to measure the success of the project. Incompleteness of the three traditional criteria for the success of the project refers to the quality, and comes from the question "quality of what?" Quality does not stand on its own. The quality is the feature set of something. Success criteria should primarily deal with the results of the project.

As the list of defined CSFs proved to be an unstandardized way to represent the project success, with significant variations depending on the type and complexity of the project, some authors have started from the premise that one must specify the perspective from which to observe the success of the project and then define this term.

3.1. STAKEHOLDER'S INFLUENCE ON PROJECT SUCCES

Literature reflects the growing trends of including customer satisfaction as a variable in the assessment of the success of the project, and also in the consideration of the project life cycle, in order to understand requirements defined at the beginning, with the assumption that customers know how to define their needs. Chan (2003) points out that project success should be analyzed through additional dimensions such as customer satisfaction, satisfaction of participants, the impact on the environment, health and safety. According to this approach, the success of the project should be seen in many aspects starting from the owner of the project, through contractors, subcontractors, customers and the wider community.

Evaluation of the project success, by different interested parties (stakeholders), in different times, can been done in diverse ways.

Although project stakeholders have been defined in numerous ways, the most common definitions view project stakeholders broadly as any group or individual who can affect or are affected by the project. In PMBOK, stakeholders are defined as individuals and organizations that are actively involved in the project or whose interest may be affected as a result of project execution or project completion (PMI, 2004).

It is widely agreed that a project has many stakeholders, whose interest may be related or in conflict. Considering an increasing influence of stakeholders, a new focus in the project management literature is on the development of models that apply the theory of the interested parties, their classification and their inclusion into the project environment (Qureshi et al., 2009).

Crucial stakeholders are internal stakeholders - members of the project team, other employees in the organization, top management in the organization (who usually support the project). It is very important for internal stakeholder to be aware of how the project success is defined, and what are key performance indicators. This highlights the importance of communication quality between team members and other employees in the organization, the method of knowledge transfer, and delegation of responsibilities. Anbari et al. (2008) pointed out that the organization structure reflects the type of organizational culture that also holds tackling information flow, knowledge transfer and overal organizational culture. The choice of a project organization structure should consider the above balance between all stakeholders.

3.2. PROJECT SUCCESS PERCEPTION TROUGH PROJECT LIFE-CYCLE PHASES

When considering project success criteria, it is essential to be clear of how we define the project. Do we use a product-oriented definition, according to which "*a project is a temporary endeavor undertaken to create a unique product or service*" (PMI, 2004 p. 5); or an objective-oriented definition in which the project is conducted to deliver beneficial objectives of change? Depending on the definition, the key performance indicators can be differentely definied.

Every project has certain phases of development known as life-cycle phases. A clear understanding of these phases permits managers to better control resources to achieve project sucess. The teoretical definitions of the life-cycle phases of a system can be applied to a project. These phases include: conceptualization, planning, testing, implementation, closure (Kerzner, 2003).

Yu et al. (2005) stated that every stage of the project has its „owner" e.g. the owner of a project conceptualization phase is a client, in case of the execution phase it is project team etc. In relation to the "owners" the key performance indicators can be defined.

3.3. VALUE-CENTRED PROPOSAL FOR ASSESSING PROJECT SUCCESS

A typical project can be viewed as an investment. As such, the project consumes resources during the execution phase. All benefits from the project are materialized in the stage of product operation. It is very useful to separate the project cost and the product value to reflect the project/product life cycle reality. A value-centred proposal for assessing project success is defining two key concepts: the net project execution cost (NPEC) and the net product operation value (NPOV), and presenting a scheme for measuring project success based on them. The net project execution cost - NPEC is defined as a difference between the cost that the client has minus the benefits accrued to the client during project execution. The net product operation value NPOV captures all the benefits a client derives from the created product during the product operation ($B_{operation}$) minus any associated operational cost ($C_{operation}$). NPOV may include less tangible benefits (strategic benefits, competitive advantages, etc.) and less tangible costs (e.g. negative externalities) and is limited to the product operation only. The separation of project execution and product operation is important in providing a meaningful measurement of the project in the ''micro'' sense. (Yu et al., 2005)

If C_o is the estimated value of NPEC, and V_o is the estimated value of NPOV, the project will be acceptable for the client if $C_o < V_o$, and vice versa. If the completion of the project is in time T, we can evaluate the project:

- comparing C_T with C_o;
- comparing V_T with V_o;
- comparing V_T with C_T.

Comparison is made under the assumption that $C_o<V_o$.
Based on the above the following can be concluded:

- Success is achieved if $V_T \geq C_T$. This project creates a positive value for the client.
- The project has the potential success if $V_T \geq C_T$ and $C_T > C_0$. Although the project generates a positive value, the budget has been exceeded.
- In contrast, the project has achieved a complete success if $V_T \geq C_T$ and $C_T \leq C_0$. This is the ideal scenario for a client.
- The project has achieved a failure if $V_T < C_T$. This project produces a negative value for the client.
- The project has achieved a controlled failure if the $V_T < C_T$ and $C_T \leq C_0$. In this case, although the project produces a negative value, the budget is effectively controlled.
- The project has achieved complete failure if $V_T < C_T$ and $C_T > C_0$. This is the worst scenario for the project produces a negative value exceeding the budget. (Yu et al, 2005)

Among the open questions one should consider the satisfaction of other interested parties (stakeholders). The authors have proposed a separation of concepts of separated value - sharing and value creation. If there are multiple parties (outside the project) who enjoy the effects of the project, it should not be a problem as long as the effects are uniformly distributed. The problem arises when the effects are not equally distributed. For example, consider the project for the construction of a shopping mall, where the project exceeded the budget, but its opening presented extraordinary success. It turns out that NPOV is not distributed evenly from the standpoint of the contractor, which caused a legal debate. A very important point is that if there is no added value of the project ($V_T \leq C_T$) , any profit of the subcontractor is the cost of the client. This causes customer dissatisfaction and should especially be considered in the contracts management.

4. A COMPARATIVE OVERVIEW OF THE DIFFERENT PERSPECTIVES OF THE PROJECT SUCCESS

As we can see from previous sections of this paper, different perspectives of project success indicated that as there are different needs and different goals of any given project, succes measurement should also be tailored for each project.

As Table 1 shows, each of those perspectives has some adventages that make them suitable for some type of projects, yet they have some disadventages.

The value-centerd approach does not consider different perspectives of different stakeholders, but this approah gives a metrix to measure project success, which is the main distincion in comparison with other approaches presented here. The stakeholder analysis takes into account different interests of different parties involved in a project and their perceptions of project success, but it does not provide an answer to how to measure project performance and how to asses project results. Using project the life-cycle concept to evaluate project success is something beetwen those two. In some way it considers stakeholders, not all of them, but the most important one (client and project team including contractor assisted by subcontractors) looking at the main phases of the project life-cycle and its “owners“.

Those perspetcitives can be seen as complementing rather than as mutually exclusive. The project success perception through life-cycle phases can be extended including other stakeholder analyses. In addition to the client and the project team, other interested parties (stakeholders) should be considered when defining key performance indicators. Looking at the value-centred approach, if there are many interested parties (stakeholders) to enjoy the effects of the project, it should not be a problem as long as the effects are uniformly distributed; otherwise their interest must be considered. Many projects create a series of external effects (positive or negative) that affect third parties who are not directly involved in the project. That initiates the need for the calculation of all cost and benefit from their

point of view and the consideration of their interest for making a realistic assessment of the project success.

Table 1. Main characteristcs of different perspectives of project succes

	Stakeholders analysis	Project life-cycle	Value centred approach
Link with project defination		✓	
Developed scheme for measuring project success			✓
Considering organizational structure and organizational culture,	✓		
Adopting the single cost-value dimension for assessing project success			✓
Defining project stages and their owners to examine project success criteria		✓	
Considering information flow and knowledge creation	✓		
Considering different perceptions of project succes of different interested parties	✓	✓ / -	

5. FORMAL SYSTEMS MODEL

Fortune and White (2006) point out the following shortcomings of the critical success factors concepts. Firstly, the CSF list does not provide a mechanism for the interdependency determination. Secondly, the implementation of this approach is viewed as a static process (rather than as a dynamic one) as this process ignores the fact that some factors are in the particular project phase more, and in another phase less significant.

The authors propose the use of a formal system model that consists of a set of subsystems such as decision-making subsystem, the subsystem performance monitoring and sub-systems that enable transformation (Fig. 1).

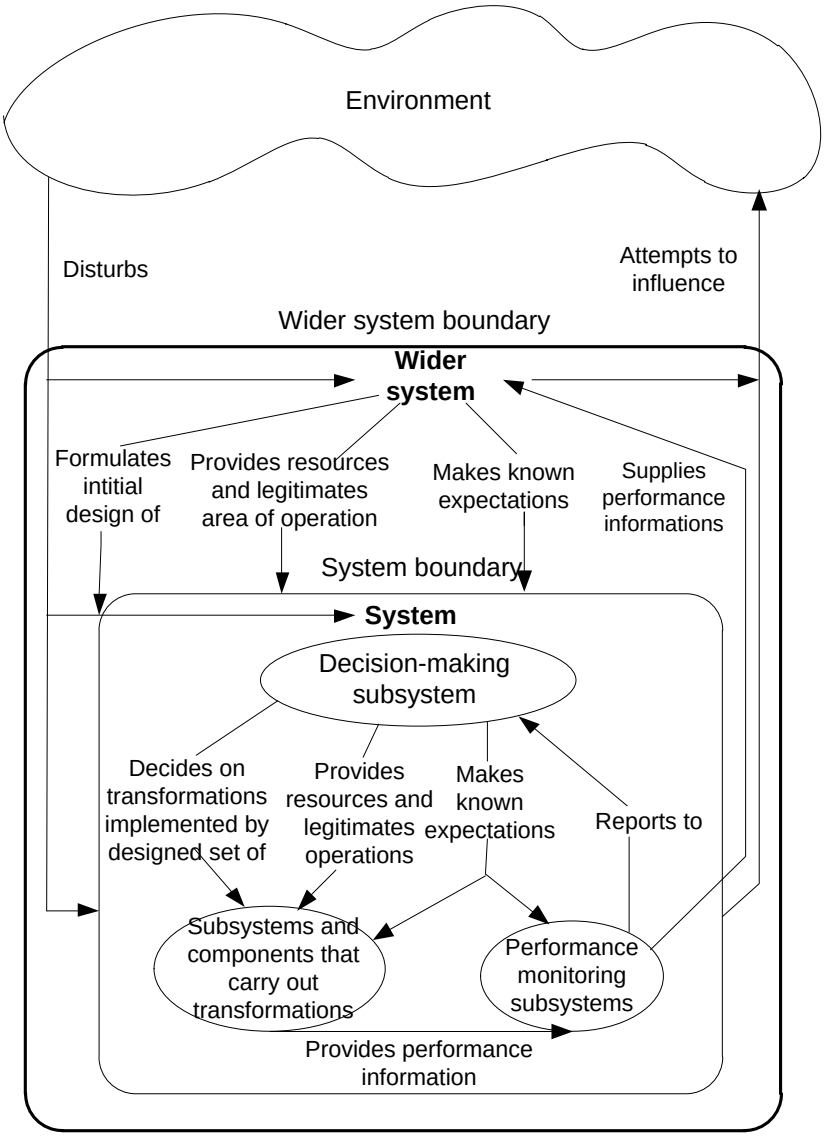

Figure 1. Formal system model (Fortune & White, 2006)

The application of this model deals with the abovemnetioned issues and provides a framework for CSFs. As the formal system model shows the relationships between the components, it makes links between the critical success factors. This model also shows the relationship with the environment, which affects the reduction of the lack of previous static CSF presentation. The model was tested in two projects. The first project is a project of the government agency that is related to the promotion of new forms of legislation in the UK. The second project is also a project in the public sector and refers to the analysis of the need for the introduction of new ICT equipment. The model, applied to both cases, gave positive results, and it has been proven that the use of the model in planning and implementation phases affect the human and organizational aspects of development projects.

Table 2 shows mapped critical factors within the formal system model. In this way, the purpose of the model is presented, in other words, a connection between factors is established to overcome the first shortcoming of the CSF list.

Table 2. Mapped CSF into Formal System Model (Fortune & White, 2006)

Components FSM/Project elements	**CSF from the literature**
Objectives and results	Clear realistic objectives
	Clear business orientation
Preformance monitoring	Efective monitoring and control
	Planned close down/review/acceptance of failure
Decision making	Top management support
	Competent project manager
	Detailed plan
	Realistic schedule
	Good leadership
	Correct choice of methodologies and tools for project management
Transformations	Suitably qualified team members/sufficient staff
Communication	Good communication/feedback
Environment	Political stabillity
	Influences from environment
	Past experience
	Organizational adaptation/culture/structure
Limitations	Project complexity/Duration/Number of team members and
Resources	Adequate budget
	Sufficient and well allocated resources
	Training provision
	Proven technology
	Good performances of contractors/subcontractors
Continuity	Analyzed and assessed risk/risk management
	Client involvement
	Different viewpoints
	Project sponzor
	Effective change management

On the same basis Gudienėa et al. (2013) presented a conceptual model for construction projects, which include groups of factors shown in the figure below.

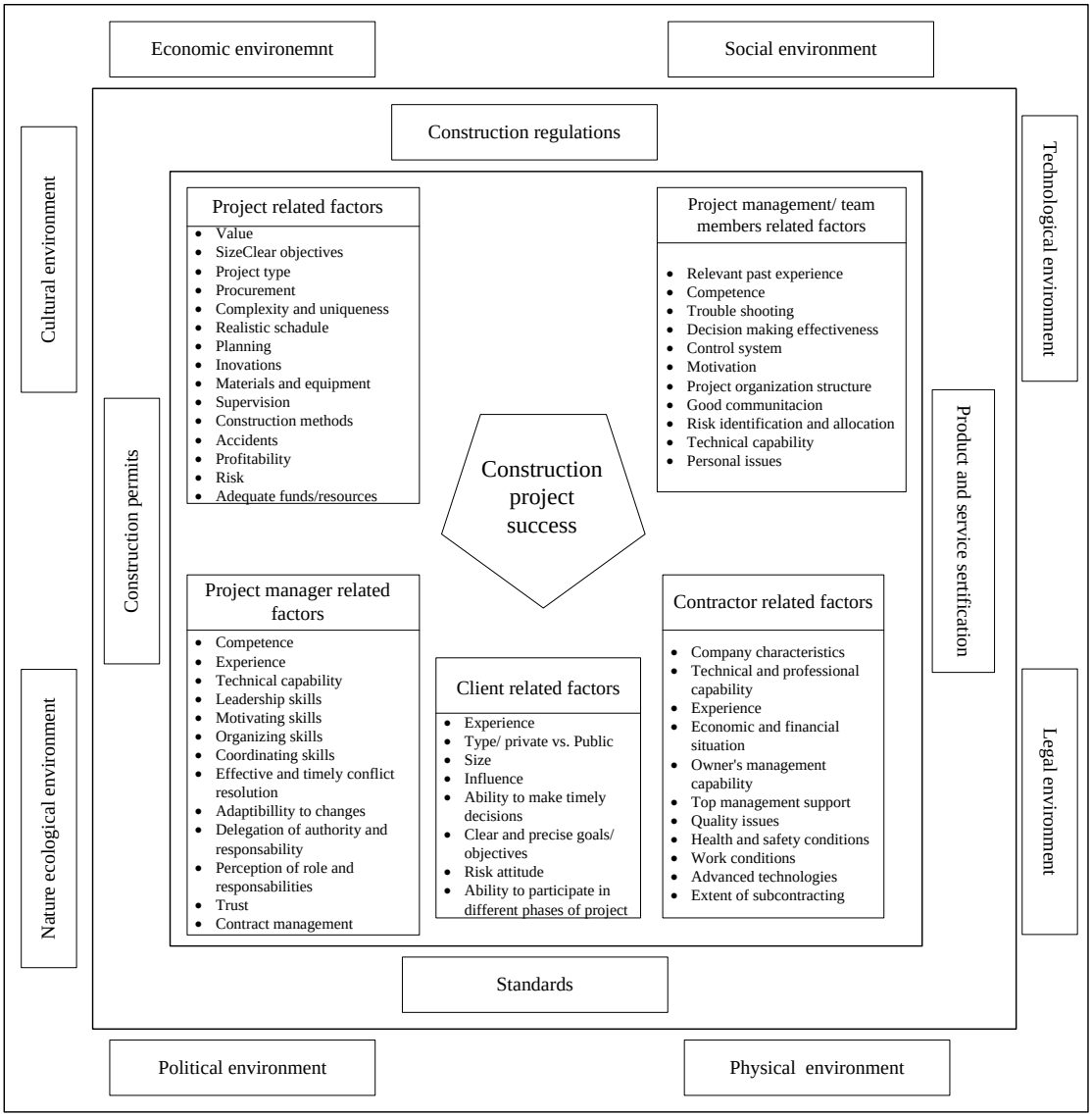

Figure 2. Conceptual *CSF* model for construction projects Gudienėa et al, (2013)

6. CONCLUSION

Different perspectives of the project success allow for focusing the critical success factors in different areas, whether they are stakeholders, phases of the project lifecycle and the value that the project has for the customer (the performing organization). It can be said that the approach is similar to the PMI approach, which defines nine functional areas of project management. For each of these areas there are defined management processes, methods, techniques and tools to be used (PMI, 2004). Presenting project success through different perspectives is a step forward in relation to the development of a list of critical success factors, and in addition to this advantage there are also some disadvantages. The disadvantages are related to static perspective to the project and ignoring the fact that some of the factors in a particular phase are more, and in a second phase less significant.

In the development of approach to critical success factors, Fortune and White (2006) first described a formal system model for the integration of critical success factors, which overcomes the lack of CSF lists pointing to the interdependencies of critical success factors and a dynamic project environment. In this model the subsystem for performance measurement is not recognized. In addition, the model points on environmental influences but does not describe adequately the dynamic environment of the project. It does not consider general and specific project environment, or in other words, environmental influences and their impact on

the internal project processes through specific activities.

Assessment of the project success should be a vital part of project management, as it presents a significant contribution to project management improvement, and a great source of knowledge for future projects.

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REFERENCES

[1] Abdul Rahman, H., Yahya, I. A., Beravi, M. A., Wah, L. (2008). Conceptual delay mitigation model using a project. *Construction Management and Economic, 26*, 15-27.

[2] Anbari T.F., Carayannis G.E., Voetsch J.R. (2008). Post-project reviews as a key project management competence. Technovation, 28, 633-643.

[3] Atkinson R. (1999). Project management: cost, time and quality, two best guesses and phenomenon, it's time to accept other success criteria. Internaltional Journal of Project Management , 17 (6), 337-342.

[4] Bryde J.D. (2005). Methods for Managing Different Perspectives of Project Success. British Journal of Management, 19, 119-131.

[5] Bryde J.D. (2003). Modelling project management performance. International Journal of Quality and Reliabilaity management, 20 (2), 229-254.

[6] Chan A.P.C. (2004). Key performance indicators for measuring construction success. Benchmarking: An International Journal, 11 (2), 203-221.

[7] Cooke-Davies T. (2002). The real success factors on project. International Journal of Project Management , 20 (3), 185-190.

[8] Engwall, M. (2003). No project is an island: linking projects to history and context. *Reserach Policy, 32*, 798-808.

[9] Fortune, J., White, D. (2006). Framing of project critical success factors by a systems model. *International Journal of project management, 24*, 53-65.

[10] Freeman, M., Beale, P. (1992). Measuring project success. *Project Management Journal, 23* (1), 8-17

[11] Gardiner P., Stewart K. (2000). Revisiting the golden triangle of cost, time and quality: the role of NPV in project control, success and failure. International Journal of Project Management , 18 (4), 225-296.

[12] Gudienėa, N., Banaitisa, A., Banaitienėa, N., Lopes, J. (2013). Development of a Conceptual Critical Success Factors Model for Construction Projects: a Case of Lithuania. *Procedia Engineering, 57*, 392 – 397.

[13] Ika, L., Diallo, A., Thuillier, D. (2012). Critical success factors for the World Bank projects: An empirical investigation. *International Journal of Project Management* , 105-116.

[14] Judgev, K., Muller, R. (2005). A Retrospective Look at our Evolving Understanding of Project Success. *Project Management Journal, 36* (4), 19-31.

[15] Kerzner H. (2003). Project Management: A system approach to planning, scheduling and controling. New Jersey: John Wiley & Sons.

[16] Kerzner, H. (2011). *Project Management Metrics, KPIs and Dashboards.* New Jersey: John Waley and Sons.

[17] Norrie, J., Walker, D. (2004). A balanced scorecard approach to project management leadership. *Project Management Journal, 37* (4), 47-56.

[18] Pinto, J., Slevin, D. (1988a). Critical success factors across the project life cycle. *Project Management Journal, 19* (3), 67-75.

[19] Prabhakar, P. (2008). What is project success: A literature review. *International Journal of Business and Management*, 3-10.

[20] PMI. (2004). A guide to the project managemement body of knowledge. Project Management institute.

[21] Qureshi M.T., Warraich S.A, Hijazi S.T. (2009). Significance of project management performance assessment (PMPA) model. International Journal of Project Management, 27, 379-388.

[22] Shenhar A.J, Dvir D., Levi O., Maltz A.C. (2001). Project success; a

multidimensional strategic concept. Long range Planning, 34, 699-725.
[23] Toor S., Ogunlana O.S. (2010). Beyond the "Iron triangle": Stakeholder perception of key perfomance indicators (KPI's) for large-scale public sector development projects. International Journal of Project Management, 28, 228-236.
[24] Van Veen-Dirks, P., Wijn, M. (2002). Strategic Control: Meshing Critical Success Factors with the Balanced Scorecard. *Long Range Planning*, *35*, 407–427
[25] Wasioyo K. (2010). Using Cross Project Learning to Improve Project Management. PMI Global Congress Proceedings, (str. 1-13). Washington DC.
[26] Yu G.A., Flett D.P., Bowers A.J. (2005). Developing a value-centred proposal for assessing project success. International Journal of Project Management, 23, 428-436.

PROJECT MANAGEMENT IN GREEN TECHNOLOGIES PROJECTS

Miodrag Vuković – *PM College, Beograd*

Abstract: With an intention to decrease operating costs, many organizations today are preparing their action plans for energy savings and carry out measures for energy efficiency in order to improve competitiveness and decrease carbon footprint. On the other side, companies which provide energy services need developed competences for their projects, in order to achieve the desired results and prove worthy of their investors' trust. In this paper, the most important aspects for project management in energy efficiency projects are highlighted.

Key words: Energy efficiency, project management, green technologies, energy performances, energy saving projects.

1. FOREWARD

Energy effieciency is in the heart of the EU strategies up to 2020 oriented to achieving sustainable growth and efficient economy. Recently, a new EU Directive 2012/27/EU Directive on Energy Efficiency has been adopted, promoting the targets as regards achievement of European goals in this area up to year 2020 and beyond. The expected outcomes from the implementation of this Directive, besides energy savings and lower emission of GHG with a decreased emission of CO2 for 4-5% in 2020, new potential work places between 280.000 i 450.000 are expected, mainly in the building sector and the provision of energy services (European Commision – Energy Efficiency, 2013).

In order to achieve energy savings, big companies and public companies in Serbia have recently been obliged to implement energy management, with the task of setting up energy management in their organiyations and prepare action plans for energy efficiency.

In order to achieve the goal of lower operating costs through energy savings, for many organizations procurement of the following energy services is required:

- Delivery and installation of energy efficient equipment, often in combination with its management and maintenance
- Monitoring of energy consumption
- ESCO (energy performance contracting) services.

Of vital importance for the companies offering energy services, is to offer competitive solutions, to know how to attract clients and to effectively manage such projects.

2. PROJECTS IN ENERGY EFFICIENCY

Energy efficiency field could be devided into sectors where these technologies are applied: buildings, utility, industry, civil sector, sectors of trade and services, public sector and transport. Energy efficiency projects which could be applied in these sectors are listed in the following table. This list is intended to present a variety of projects in energy efficiency, and not to serve as an overall and final list of such projects.

Table 1.Types of projects in energy efficiency

Buildings	- Thermal insulation of external walls - Thermal insulation of windows - Thermal insulation of roofs - Energy rehabilitation of previously constructed facilities - Efficiency of the heating system (efficiency) - Heat pumps for heating and air conditioning - Waste heat recuperations - Measuring consumption of energy for heating - Smart buildings - Smart Home - Design home with natural light

	- Design of passive solar house - Solar systems for domestic hot water preparation - Heat pumps for obtaining domestic water heating (air - water) - Thermostatic valves for heating - Energy-efficient pumps to circulate water for heating - Activation of the cooling system on an air temperature above 24° C
Industry	- Energy efficient pumps and compressors - Drives on electric motors and pumps - Utilization of waste heat from the condensate return system supply of steam - Reduction of losses in the compressed air system - Recovery of waste heat from the flue gases - Recovery of waste heat from the compressor - Recovery of waste heat from waste water - Reconstruction of the distribution of steam - Automatic control of oxygen content in combustion processes - The system of condense recovery in boilers - Preheating of fresh water to condition water for boilers - Insulation of piping - Multi-stage compressors for cooling in industrial refrigeration systems - Multi-stage damping - Precooling of condense in the cooling system - Energy efficient industrial lighting - Introduction of new energy-efficient equipment - Software for Energy Management - Reduction of reactive power and increase of power factor
Utilities	- Reduction of losses in electricity transmission - Reduction of losses in the transmission of heat - Automatic load control network - Software for management of the distribution network - Reduction of reactive power and the power factor increase - Measurement of heat consumption by end users in the district heating - Modernization of boiler plants in district heating systems - Cogeneration Plants
Households, companies in sectors of trade and services	- Energy Efficient Lighting - Automatic lighting - Solar systems for domestic hot water preparation - Energy efficiency of household appliances - Energy efficiency of computer equipment - Energy efficiency of consumer electronics - Use of renewable energy sources for electricity production - Use of renewable energy sources for heating support
Transport	- Development and advancement of a public transport - Introduction of new technologies in transport - Use of electric vehicles

From the above table it can be concluded that for each of these projects built competencies shall be available, in order to provide quality energy savings projects.

3. STAKEHOLDERS FOR ENERGY SERVICES

According to the theory of stakeholders, which is nowadays accepted and popularized in 1984 by Edward Freeman in his book "Strategic Management", stakeholders are seen as a group or individuals who can affect or are affected by achieving the organization's objectives. The stakeholders can beclassified into key and secondary, where the key stakeholders are groups who are associated with the market, assuming the customers, suppliers, employees and investors, and the

environment with use of natural resources. Other stakeholders can be for example the community or the government.

For the realization of one energy efficiency project, at least two interested parties must exist: the client and the provider of the energy service. On the other side, when it comes to projects of higher volume and complexity, such projects will have more interested parties, so that initially involved is the local community that has an interest in encouraging (co-financing and promoting) the development of services in the field of energy efficiency and improvement of the environment, but, on the other hand, decides on approving the execution of works for such projects, especially in accordance with the Law on Planning and Construction, the Law on the Rational Use of Energy, and the Energy Law. Of course, with these three primary stakeholders, there are other interested parties who would like to participate in the project, such as banks, subcontractors, suppliers of equipment and materials, and other.

In this paper, we focus our attention upon the expectations of the contracting authority of the project . The client for the energy efficiency project is initially interested in a short payback period, then in the security of the investment, the achievement of the expected results of the project , especially in terms of energy savings and reduced operating costs for energy. Then, clients do not expect to experience the technical problems during the operation or some hidden maintenance costs.

4. KEY SUCCESS FACTORS OF ENERGY EFFICIENCY PROJECTS

As previously mentioned, it is, on one hand, important to meet the expectations of the contracting authority of the project, and they should meet the criteria of success of the EE as the period of ROI, savings, as well as reliability characteristics of the system. On the other hand, the provider of energy services, which include project management, must take into consideration these demands of investors interested in early project phases, not only on the revenue, and earn on the project for the utilization of resources, business sustaining and further development .

With regard to these criteria, the following section points derived from a compilation of literature and experiences in energy efficiency projects management, and highlights the key practices in energy efficiency projects, for the achievement of planned results. These practices include:

1) **Careful planning of the project**, through a detailed definition of the proposed solution, which includes not only the system that is delivered, but also the impact on other existing systems (for example, taking into account existing projects, installations and systems within the building, then the funds that will be used as basis for upgrading of an existing system (either in terms of roofs, walls, or parts of the drive system). Devoting enough time in this phase, quality planning and development of the WBS of the system is essential to the future results of the project, especially in achieving the expected energy performance.

2) **Having strong competence in the energy efficiency technology**, particularly the technology for the industry in the EE . Mastering the technology that is used is of crucial influence on the results of the project. In this regard, the absorption capacity of innovative technologies for energy efficiency is one of the key parameters (Eichhammer, W., Walz, R, 2011). Knowledge in the application of the EE technologies is reported to be sufficient and is shown separately in the design stages of the decision and execution solutions.

3) **Having the knowledge and skills of project management**, which include the methods of project management, from project planning, to risk management and managing changes to the management of costs and time.

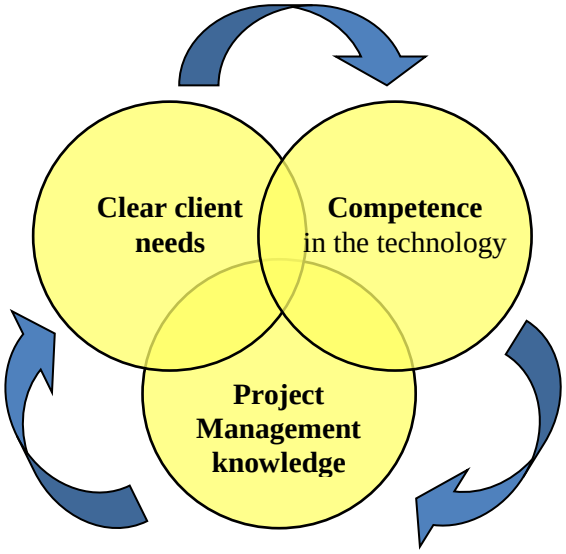

Figure 2: Key aspects of energy savings projects

To these factors we also add the **accuracy of evaluation of investment indicators**, calculated by taking into account not only the technical brochures of manufacturers, but also using benchmarks with similar systems implemented, which should provide an objective and reliable picture for the investor about the expected impact of the project, before they make any investment decisions. In times of crisis, with the lack of money in the organization's budgets, a shorter payback period is almost necessary. The indicators of returns on investment in the energy efficiency projects are the most important criteria for the success of the project. Overoptimistic forecasts prior to the implementation of the project could lead to disappointment of the investors and thus to negative references. The most recommended way will be to determine these indicators in the preparation of the feasibility study, which will show the cost of the system components, contractors, maintenance and operating costs of the system. When it comes to smaller scale investments, the cost of developing an independent feasibility study is usually not justified. However, the application of methods of the sensitivity analysis is a useful tool for evaluating the returns on investment in case of deviations from the planned level of savings.

5. CONCLUSION

Lowering the operating costs in the business is the imperative in the oday's competitive conditions. Projects for achieving energy savings are therefore important for almost all organizations, especially for intensive energy use organization. The key success factors for the realization of energy efficiency projects are clear customer needs, the competence of energy services provider as regards a particular technology, the knowledge of the methodology of project management and a clear determination of investment indicators of the returns on investment.

REFERENCES

[1] Eichhammer, W., Walz, R., Industrial Energy Efficiency and Competitiveness, UNIDO working paper 05/2011, 2011

[2] European Commision, Energy Efficiency (http://ec.europa.eu/energy/efficiency/index_en.htm)

[3] Institute for European Environmental Policy (IEEP), Review of Costs and Benefits of Energy Savings, Task 1 Report 'Energy Savings 2030', (www.ieep.eu), UK, 2013

[4] Jovanović, Petar, Investiciono odlučivanje, Junior, Beograd, 2000

STRATEGIC PERFORMANCE MANAGEMENT SYSTEM OF PUBLIC SECTOR ORGANIZATIONS IN SERBIA: THE ROLE OF AN ACCOUNTABILITY SYSTEM

Zorica Mitrović, Marija Todorović, Dragan Bjelica
Faculty of Organizational Sciences

Abstract: This paper emphasizes the need to introduce and involve an accountbility system into Serbian Central Government institutions. Strategic performance management and accountability system are based on the New Public Management (NPM) theory, starting in 1980ths. Since 2004, the Serbian Goverment is trying to make a difference adopting some of NPM doctrines, but the lack of accountability system really stays in the way of efficiency and effectiveness. This paper examines the concept of accountability and different models of accountability systems. A previously conducted research has shown that the preconditions for an accountability system implementation are: accountabilty environment and culture based on accountability, as well as use of accountability tools. In the case of the Serbian Goverment the key tools, besides the existing ones, would be the introduction of performance plans, performance based contracts, performance agreements and accountability meetings. Also, the cornerstone of culture-based accountability would be strong leadership and continuity of processes.

Key words: Accountability, Performance Management, Strategic Management, Management System.

1. INTRODUCTION

Experiences of developed countries showed that introduction of strategic performance management system is a key to increased effeciency and effectiveness of the public sector organizations. In this paper the system of strategic perfomance management refers to a broad concept of the management system, a platform that provides the implemetation of different methodologies including Startegic Management, Project Management, Performance Management, Knowledge Management, Total Quality Management, Six Sigma, and tools and techniques like Balanced Scorecards, Startegy Maps and others.

This system is usually comprised from three or more subsystems, planning, monitoring and accountability systems that are compulsory, but it could be integreted with systems like knowledge management, improvement system and reporting system separated from the monitoring system, depending on a particular organization's needs. It is of paramount importance that the development of the system is taken step by step, but that every step should include the development of an accountability system. Without an adequate accountability system the chances of efficient and effective functioning of the strategic performance management system are minimum. And this is the case of the Serbian Central Government; the system of strategic planning and monitoring is developed, but there is no assigned accountability for results. Consequently, planning and monitoring processes are usually just formality and do not have any impact on the future. Implementation of a cross-functional accountability system could be a way to overcome some of those practical implications in the public sector organizations. The preconditions for a successful implementation are ledarship and continuity of processes.

2. NEW PUBLIC MANAGEMENT

Performance based management practice in the public sector organizations is closely related to the New Public Management. Even more, performance management and preasure on results was one of the basic doctrines of the New Public Management.

Most of the 20th century debate on the public policy administration and management were in narrow domain, but in 1980s, policy questions on the role and structure od public bureaucracy became important and numerous in most of the developed countries (Brazelay, 2001). During her mandate as the Prime Minister of the United Kingdom, Margaret

Thatcher successfully made a political issue of the culture, size, and cost of the British public service. Playing in a functional role of "policy entrepreneurs" (Brazelay, 2001), and the official role of the prime minister, Thatcher led the change in the policy of public sector in the field of organization and methods, public services and employment, expenditure planning and financial management, audit and evaluation and supply. Her successor, John Major, kept the issue of management of public sector high on the agenda of the Conservative government, which has led to the implementation of the *„Next Step Iniciative"* and initiated *"Citizen Charter Iniciative"*, *"Competing for Quality"*, *"Resource Accounting and Budgeting"* and *"Private Finance Initiative"* (Brazelay, 2001).

In the 1980s, the issue of the public sector management became an active area of policy in many other countries, particularly in New Zealand, Australia and Sweden. At the same time, the Organization for Economic Cooperation and Development (OECD) established the Public Management Committee and Secretariat (PUMA).

In the 1990s the policy of the public sector management became an important topic on the agenda of President Clinton. One of the first political activities of the Clinton Administration were the initiating of the *"National Performance Review"* and its transformation into a low *"Government Performance and Results Act"* (Brazelay, 2001).

In Serbia, the reform process of public administration started in 2004 with the adoption of the Public administration reform strategy. A wide range of actions have been undertaken over the last eight years in order to build and develop a sufficient capacity in the Central Government to strengthen planning, monitoring and policy coordination processes for an effective support needed for addressing complex policy challenges. The first step was to build sufficient capacities for the Government's operational and then strategic planning process. This process started in 2005 when the Government of Serbia decided to launch an important project to improve the efficiency and the effectiveness of the central public administration in the field of planning, budgeting, monitoring and reporting. Now, after nine years, the Central Goverment have built capacities for strategic planning on both organizational and individual levels but still lack good performances. One of the main reasons is the lack of accountability system that will provide not only strategic planning, since this is not enough for good performances, but strategic performance management.

The introduction of an accountability system should be a mandatory step in the development of an integrated strategic performance management system. This is because of the fact that the accountability is a key to the management system success and performance improvement. Although strategic performance management is originally developed in the private sector, the accountability issue and establishment of an accountability system gained special atention in the public sector organizations. Therefore it is important to understand the concept of accountability, the proces of establishing accountability and what the main accountability tools are, because an accountability system setting is the next step on the public administration reform agenda.

3. WHAT IS ACCOUNTABILITY?

Accountability forms the cornerstone of the management systems performance (Otley, 1994). It is usually assumed that higher accountability provides a deeper insight and transparency of organizational activities, enabling appropriate organizational behavior, and ultimately leading to the improvement of organizational performances (Dubnick, 2005). Demands for accountability are often initiated by the poor performances and attempts to improve the performance (Agyemang & Ryan, 2013).

To understand the concept of accountability it is necessary to understand the complexity of the relationship between external and internal accountability of the organization and the performance management system. The complexity of relations of internal and external accountability lies in the tension between interal accountability in an organization of hierachical autority levels and the external organizational accountability to stakeholders (Parker, 2002). Additionaly, the

starting point for managing the relations is the performance management system which ensures that resources are used efficinetly and effectively for achievement of organizational objectives. The transfer of funds to the organization by external stakeholders (e.g. invesitors, shareholders or budget) creates a demand for the accountability for delivering information about using these resources internally. In this way performance management links internal and external accountability. Furthermore, the increasing demand for accountability can result in a more stringent management control, because of the tendency of managers to influence organizational performances in this way.

Managers who report about accountability based on performance assessment, have to adapt the performance management system in order to improve performance and provide the necessary information for the report. In the process of internal accountability establishment, the focus is on employees whose work is measured and based on the assessment where they could gain or lose their power.

A very important issue in the public sector organizations is accountability to external stakeholders. One of the key stakeholders is the central government having in mind that there is an increasing level of regulation from the central governments as they strive to make the public sector organisations accountable for the resources they receive via taxation (Olson et al., 1998; Ranson, 2003).

Andersson et al. and Gleadle and Haslame noticed that there is an infiltration of stakeholders expectations in definition od performance measures that aims to achieve certain targets or investors requirements (Gleadle and Haslal, 2010; and Andersson et al. 2008). Andersson et al. Discuss the "financialisation of strategy" to depict the pressures that managers are under to create shareholder value by changing their strategies for wealth creation.

In the public sector, accountability is usually discussed as political accountability or the accountability of politicians to the electorate. Since the 1980s and the introduction of the New Public Management there is an increased recognition of consumer accountability and concern to meet the needs of the populace as consumers of public services. This meant attempts by the central governments to change the behaviours of the public sector organisations through making use of more hierarchical and managerial accountability relationships that exist between the public sector organisations and the central government.

The development of the accountability system for the public sector organizations was one of the main topics in the 1990s. Today countries like USA, UK, Canada and others have established organizational units, offices dealing with the development of performance accountability system. In addition, accountability to the central government and other stakeholders, a new public management has led to a tendency to manage the public sector organizations as private ones, introducing greater individual accountability of employees for the performance of their organizations. An accountability system is significant for sustainable and successful organizational performance management and accountability is often a key to organizational success.

Accountability is a multidimensional concept. In terms of performance, there must be a shared accountability between managers and employees, as well as a diference between responsibility and accountability and between the authority and responsibility. Maybe the easiest way to explain accountability is by explaining the key aspects of accountability (PBM SIG, 2001):

Accountability is a relationship – Relationship /contract is between a person /group/ organization with assigned authority and a person/group/organization who has been delegated responsibilities by that authority.

Accountability is results-oriented - In today's public and private sector organizational structure, accountability does not look at inputs and outputs, it looks at outcomes.

Accountability requires reporting. - Reporting is the "backbone" of accountability. Without it, accountability will not stand up. Reporting, as used in this context, means two things: providing an account of actions and results and providing a tangible evidence of results.

Accountability is meaningless without consequences - A key word used in defining and discussing accountability is obligation. Accountability is an obligation to answer for the discharge of responsibilities.

Accountability improves performance - The goal of accountability is to improve performance, not to place blame and deliver punishment.

It can be concluded that the understanding of the importance of the concept of accountability is crucial for organizations that want to establish a system of strategic performance management. Accountability is a tool that organizations and their managers use to motivate individuals, groups and the entire organization to meet the requirements of key stakeholders and thus contribute to the success of the organization.

A prerequisite for establishing a system of accountability for performance is a well-established performance measurement system that provides a reliable and true information about the performance of the organization. Similarly, the establishment of an integrated system of accountability is a prerequisite for successful functioning of the organization's strategic performance management. This not only enables the monitoring of performance along the lines of management of individuals across organizational and business unit to the whole organization, but also allows the use of management action to concern poor performances and reward good ones.

It is imperative that the system of accountability extends through the organization and that we should simultaneously develop the establishment of strategic performance management systems, ensuring full integration with all their sub-systems and key processes within them.

For the purpose of improving the performance of the state administration in the United States a model called GEAR (Goal-Engagement – Accountability - Results) was developed. Starting with the goal of improving the federal performance management system, the Employee Performance Management Workgroup came to realize that there are not systems problem – problems are human ones and they are entrenched in the cultures of agencies. The workgroup also discovered that there is a gap among the various functions responsible for organizational performance improvement and employee performance improvement. People working hard to improve the performance of agencies and people working hard to improve employee performance are often not communicating and working with each other, but rather working on parallel tracks (Employee Performance Management Workgroup, 2011). The workgroup's recommendations describe the handshake and dialogue necessary not only for the employee and supervisor, but also between bottom-up employee performance management and the top-down cascade of organizational performance management from the agency head to the individual employee. Effective and productive relationships between managers and employees are necessary for performance improvements. To create high-performing organizations that are aligned, accountable, and focused on results, the workgroup recommends agencies take on the following goals (Employee Performance Management Workgroup, 2011):

- Articulate culture of high performances,
- Align performance management on an individual level to management performance at the organizational level,
- Implementation of accountability at every level,
- Creating a culture of increased engagement,
- Improving the assessment, selection, training and development of supervisors.

Wandersman et al. proposed a model called GTO (Getting it out-comes: methods and tools for planning, evaluation and accountability), designed to help professionals in the formulation of strategy planning, implementation and evaluation of programs and policies (Wandersman et al, 2000). In this model the acountability is defined as the systematic inclusion of critical elements of planning, implementation and evaluation of the program in order to achieve results. The GTO is based on a combination of several theories: the traditional evaluation, empowerment evaluation, outcome-oriented-accountability and continuous quality improvement.

The model that is perhaps the best known tool for establishing accountability is the already

mentioned results-based accountability - RBA model. The RBA model can be developed and used at different levels state, agency or program levels. Originally, this model was developed by Brizius, J. A., and Campbell, M. D. in 1991th Getting results: A guide for government accountability (Brizius & Campbell, 1991).

The decision about the model that should be implemented in particular organisation, even if it is a case of the Central Government should be based on the selection criteria such as the maturity of the organisation. In the case of the Serbian Central Government the first step in establishing accountability should be establishing culture based on accountability for performance. Ensuring the culture of performance accountability is the only way for accountability system to be functional. Otherwise the situation will be the same as with any other system, it will exist in a formal way and it will disapear with new elections.

4. ESTABLISHING ACCOUNTABILITY FOR PERFORMANCE

To establish accountability for performance in the Serbian Central Governemnt it is neccessary to develop the accountability system as a set of interactive and interconnected elements supported by an accountability culture. While an accountability system provides execution and fulfillment of accountability obligations, the environment integrates accountability into the individual, team, and organizational performance systems. The establishment of accountability environment refers to an enviroment that motivates employees to execute their authority and/or fulfill their responsibilities, stimulate them to perform their work and achieve the desired results, inspire them to share (report) their results; and willingness to accept the liability for those results (PBM SIG, 2001). Therefore, in the first step in the accountability culture establishment is to establish an accountability environment. To create an environment accountability culture the system needs leadership. That could be individual or group in a position of authority to direct and control the work of others. The role of leaders is crucial in insisting on accountability. The leaders are not just people in power, they are truly committed to ensuring that everybody is accountable for their results.

But to ensure an accountability enviroment as a base for accountability culture there is a need for reciprocal accountability that will ensure the “two-wayness” of the accountability relationship. If the manager is responsible for providing adequate direction, guidance, and resources as well as removing barriers to performance, the employee is responsible for fulfilling his/her responsibilities. In this relationship, both are accountable to each other. The second precondition is clarity on authority, organizational mission, roles and responsibilities, performance expectations and performance reporting. To enable a culture of accountability there is a need of understanding who is in charge and of what, where the organization is going, in which way every individual or group contributes to that and what has been achieved so far. Also, there is a need to create a balance between accountability and authority, expectations and capacities, as well as pay and performances.

The main tools used by the organization to create an environment that supports accountability are performance agreements and performance contract. These tools should increase inclusion and empowerment of employees, promotions and various other incentives.

One of the best enablers of the organizational culture of accountability are consequences for responsibilities and obligations. Consequences can be promotions and awards but can also be bad in terms of penalties for poor performance. In both cases, the consequences help exercise the powers, fulfill obligations and improve performance. Determining the effects rather than acting on them is counter productive and diminish the meaning and importance of accountability.

The cornerstone of accountability culture is the consistency that will assure stability. The inconsistent application of policies, procedures, resources, and/or consequences within an organization undermines the accountability environment by weakening perceived organizational commitment and credibility. Consistency is important for linking with the following activities. Parties

that look at results have to consider what was done in the light of current conditions and expectations, and recognize the achievements and failures. Where it is obvious that expectations are not met, they must take corrective measures, adapt agreements regarding the responsibilities and record lessons learned. Accountability relationship without concatenation is incomplete and is unlikely to be successful.

We already mentioned leadership and its key role in establishing accountability culture, consequently the lack of leadership could cause that performance results to be much poorer than expected. Also, managers as leaders must be consistent both in terms of punishment and awards. The absence of awards or punishment could challenge the motivation of employees.

On the other hand, when there is no clear line between authority and roles and responsibilities, it is difficult to determine who is responsible for what. It also leads to some of the duties of performance being omitted. Clarity is essential to the accountability relationship. When lines of authority or roles and responsibilities are not clear, it is difficult to pinpoint where certain accountabilities reside. It also lends to some performance obligations falling through the cracks. Also it is useless to expect optimum performance if individuals or teams are not provided with the resources to perform the work. To profit from performance, organizations must invest into their employees. Further, performance information must be complete and credible, and it must be reported in a timely manner. Withholding data shows a lack of transparency and a need for mistrust. Not using data at all can come to mean that performance is not important to the organization. In either case, the accountability relationship suffers. For all this it is necessary to establish an accountability environment and then upgrade it with an accountability culture.

Once an accountability enviroment and organisational culture based on accountability have been established, there is nothing standing in the way of the accountability system to be integrated with the existing organizational system of strategic performance management. The accountability system should be adapted to be consistent with the management process in the following way (PBM SIG, 2001):

Set measurable goals and responsibilities. Folowing from the strategic planning efforts, develop performance objectives, measures, and expectations. Identify roles and responsibilities in relation to achieving these expectations.

Define operative plans. Plan what needs to be done to achieve the goals. Identify what actions need to be taken, who should take them, when and at what cost. Then identify the resources that will be necessary to achieve the objectives. Plan the consequences.

Do the work and monitor progress. Perform the work and measure its progress. Collect and analyze performance data.

Report on results. Prepare complete, understandable, and reliable reports on performance results and submit to pertinent entities in a timely manner.

Evaluate results and provide feedback. Evaluate results to determine what corrective actions need to be taken to improve performance or to determine what rewards should be given for an efficient and effective performance.

Similarly, a simple procedure for the establishment of team responsibilities could include the following:

- Set expectations,
- Hold team and individuals accountable,
- Measure progress,
- Provide the neccessary information,
- Link with consequences,
- Evaluate effectivity.

5. ACCOUNTABILITY TOOLS

Having in mind that acountability for performance cannot be established without the use of tools for establishing accountability, this chapter focuses on a brief description of the tools that could be applieed in the Serbian Central Governement accountability system.

Some of the most useful tools recomended by different authors are: strategic, middle term and one year plans, performance plans, performance agrrement, performance reports, performance-based contracts, self-assessments, performance reviews,

management controls, and accountability meetings.

Strategic planning is a process that helps organizations think about the goals that should be set in order to fulfill their mission and the direction they should move to achieve the targets set. This is the basis of planning, budgeting, execution, control and evaluation of the activities of an organization. Good strategic planning includes the creation of a consensus on the goals and priorities of the organization; provide a basis for resource allocation and operational planning, defines the starting point for control output and helps with assessing organizational performance (PBM SIG, 2001). The middle term and one year plans contain specific and more precise details and an even better base for determining and assigning accountability. They are also a base for performance plans.

Performance plans should outline organizational commitment to achieving specific results as regards the goals, objectives and strategies of the organizational strategic plan for the resources requested in the budget. In other words, performance plans state what is going to be accomplished for the budgeted money. Performance plans should be one-year plans and they should be adopted at the same tame as the budget for following year.

Performance plans should be used for establishing performance agreements and for the purpose of comparison with actual performance results. The agreements state the expectations for each party signing the agreement. They help improve communication with customers and stakeholders and make transparent the conduct of an organization or an individual. Agreements written in plain and concise format with specific annual deliverables allow customers and stakeholders to know what they are getting for their money as well as give them an opportunity to influence organizational priorities. These two documents were never used before in government administration, however, introducing them as tools for setting the accountability system could really make a difference.

Also, it would be very useful to introduce annual accountability reports that include the program and financial information, such as audited financial statements and performance measures reflecting the performance in meeting key organizational goals. Reports increase transparence of the organization's actions and at the same time make the organization proud to fulfill the promised. The Employee Performance Management Workgroup from the US recomended defining the reporting schedule because it provides timely monitoring of all key events. For example, the definition of semi-annual report on the results achieved in relation to a document which outlines the goals and priorities for the period.

With the application of quality management systems many organization adopted the performance-based contracts. They are used to streamline the procurement cycle, achieve lower costs and higher quality and move away from audit and inspection at the end of the procurement cycle to building in the performance expectation at the beginning of the cycle. In the public sector it allows providers to be innovative in how they deliver the desired end product, among other things, by focusing on what the purchaser wants as an end product. Performance-based contracts hold the customer accountable for establishing clear performance expectations and the provider accountable for meeting those expectations.

One of the most useful tools for improving performances and setting an accountability system is self-assessment of organizations. Self-assessment is an on-going process whereby a performing organization monitors its own performance and evaluates its ability to meet performance objectives, measures and expectations, and to control and improve its processes. The culmination of this process is a self-assessment report. The report could be used by the performing organization and other organizations in the chain of authority and responsibility to evaluate and assess performance and as a basis for continuous improvement. The other tool for assessment of performances is the performance review that compares the actual performance during a specified review period with the planned performance for that period. The output information is an input for modifications that can be made to performance expectations, and

planning future directions. Performance reviews also serve as formal documentation of performance and for employee development and promotion. Employee Performance Management Workgroup from US recomended defining standards and guidelines for obtaining a reward. A clear definition of standards that are expected of employees and defining regulations which provide for different performance levels to receive appropriate respective rewards is one of the tools to increase the accountability and overall performance.

Finally, accountability meetings should be introduced and conducted on weekly bases as one-on-one meeting. The focus of these meetings should be on what the employee has accomplished during the previous week in terms of results, not activities. Does employee have any on-going problems in which case the focus will not be on problem solving, but on the management's use of authority to help remove barriers to performance, and what the employee will accomplish the following week. Again, the focus is on results. The focus is also on the future that can be carefully planned by both the management and the worker.

Also, accountability can count on tools of management controls such as the organization, the policies and the procedures that could be used to reasonably ensure that programs achieve their intended results, that resources are used consistently with the agency mission, that programs and resources are protected from waste, fraud, and mismanagement, that laws and regulations are followed and reliable and that timely information is obtained, maintained, reported and used for decision making.

6. CONCLUSION

Accountability is a cornerstone of a strategic performance management system. It should be developed at every level of the system, starting from the individual, team, organizational and at the highest-level accountability to the stakeholders of the organization. In case of the Serbian Central Government the most important stakeholders are the citizens. So the chain of providing services as well as accountability should start and end with citizens and their needs. One of the reasons that the Serbian Central Government need accountability system is the fact that every organization including line ministries, government agencies and others have plans and allocated budgets but no feedback on the execution rate. That means that information about the execution rate of a plan and budget is useless. The real accountability system would bring outcomes, good or bad, depending on planned expectations and this would make a pressure on results.

The main recommendations of this paper are to: 1) create an accountability environment, then 2) to upgrade the environment with accountability culture that consists of strong leadership and continuity. Also the accountability system should be integrated into the existing management system and it should be applied to every step of managing process starting from planning to reporting on the results and taking measures for future improvements.

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REFERENCES

[1]Agyemang, G., Ryan, B., (2013). Accountability and performance management systems within private and public sector organisational change processes. *Advances in Public Interest Accounting*, 16(in press).

[2]Andersson T., Haslam C., Lee E. and Tsitsianis N. (2008). Financialization Directing Strategy, *Accounting Forum,*Vol. 32, 261-275.

[3]Brazelay, M. (2001). *The New Public Mnagement.* Los Angeles: University of Califormia Press.

[4]Brizius, J., Campbell, M. (1991). *Getting Results. A Guide for Government Accountability — CGPA*:, 98 p.

[5]Employee Performance Management Workgroup. (2011). *Getting in GEAR for*

Employee Performance Management. National Council on Federal Labor-Management Relations.

[6]Dubnick, M. (2005). Accountability and the Promise of Performance: In Search of the Mechanisms. *Public Performance and Management Review, 28* (3), 376-417.

[7]Gleadle, P., Haslam C., (2010). 'An Exploratory Study of an Early Stage R&D-Intensive Firm under Financialization', *Accounting Forum,*Vol. 34, No. 1, 54-65,.

[8]Otley, D. (1994). Management Control in Contemporary Organizations: Toward a Wider Framework. *MAnagement Accounting Research, 5* (3-4), 289-299.

[9]Olson, O., Guthrie J., Humphrey C. (1998). *Global Warning! Debating International Development in New Public Financial Management*, AkademiskForlag,.

[10]Parker, L. D., (2002). 'It's Been a Pleasure Doing Business with You: A Strategic Analysis and Critique of University Change Management', *Critical Perspectives on Accounting,*Vol. 13, No. 5-6, 603-619,.

[11]PBM SIG. (2001). *Performance Based Management Handbook.* Calofornia: Oak Ridge Institute for Science and Education (ORISE).

[12]Ranson, S., (2003). 'Public Accountability in Age of Neo-Liberal Governance', *Journal of Educational Policy,*Vol. 18, No. 5, 459-480,.

[13]Wandersman, A., Imm, P., Chinman, M. & Kaftarian, S., (2000). Getting to Outcomes: a result-based approach to accountability. *Pergamon*, pp. 389-395.

NASTAVNI PLAN OSNOVNIH AKADEMSKIH STUDIJA - PROJEKTNI MENADŽMENT

I GODINA

I Semestar

- Menadžment
- Osnove ekonomije
- Informatika I
- Engleski jezik I

II Semestar

- Teorija upravljanja projektom
- Matematika
- Informatika II
- Engleski jezik II

II GODINA

III Semestar

- Strategijski menadžment
- Alati za upravljanje projektima
- Teorija organizacije
- Osnove finansija
- Upravljanje rizikom projekta - Izborni

IV Semestar

- Osnove marketinga
- Softverski paketi za upravljanje projektima
- Upravljanje ljudskim resursima - Izborni
- Upravljanje promenama u projektu - Izborni

(Studenti biraju dva izborna predmeta)

Praksa

III GODINA

V Semestar

- Upravljanje investicionim projektima
- Projektni menadžer i timski rad
- Program menadžment – Izborni
- Upravljanje projektima u javnom sektoru - Izborni
- Preduzetništvo – Izborni

(Studenti biraju dva izborna predmeta)

VI Semestar

- Projektni portfolio menadžment
- Upravljanje informatičkim projektima
- Projektna organizacija - Izborni
- Izrada biznis plana - Izborni
- Upravljanje komunikacijama u projektu - Izborni

(Studenti biraju dva izborna predmeta)

Završni rad

NASTAVNI PLAN MASTER AKADEMSKIH STUDIJA - PROJEKTNI MENADŽMENT

I GODINA

I Semestar

- Savremeni menadžment
- Metodologije projektnog menadžmenta
- Pravci razvoja projektnog menadžmenta

II Semestar

- Upravljane znanjem
- Projektno liderstvo
- Upravljanje kvalitetom projekta

II GODINA

III Semestar

- Upravljanje kapitalnim projektima – Izborni
- Upravljanje biznis i društvenim projektima – Izborni
- Upravljanje ugovaranjem u projektu - Izborni
- Finansijska tržišta i institucije - Izborni
- Krizni menadžment - Izborni
- Projektno finansiranje - Izborni

(Studenti biraju tri izborna predmeta)

IV Semestar

- Praksa
- Završni rad

NASTAVNI PLAN OSNOVNIH AKADEMSKIH STUDIJA - POSLOVNI I INOVACIONI MENADŽMENT

I GODINA

I Semestar

- Menadžment
- Osnove ekonomije
- Informatika I
- Engleski jezik I

II Semestar

- Teorija upravljanja projektom
- Matematika
- Informatika II
- Engleski jezik II

II GODINA

III Semestar

- Strategijski menadžment
- Proizvodni menadžment
- Teorija organizacije
- Poslovne finansije

IV Semestar

- Inovacioni menadžment
- Menadžment tehnologije
- Upravljanje ljudskim resursima - Izborni
- Marketing menadžment - Izborni
- Upravljanje promenama - Izborni

(Studenti biraju dva izborna predmeta)

Praksa

III GODINA

V Semestar

- Ekološki menadžment
- Investiciono odlučivanje
- Biznis inovacije - Izborni
- Preduzetništvo – Izborni
- Upravljanje komunikacijama - Izborni

(Studenti biraju dva izborna predmeta)

VI Semestar

- Upravljanje inovacionim projektima
- Savremeni menadžer
- TQM - Izborni
- Izrada biznis plana - Izborni
- Menadžment MSP - Izborni

(Studenti biraju dva izborna predmeta)

Završni rad

NASTAVNI PLAN MASTER AKADEMSKIH STUDIJA - POSLOVNI I INOVACIONI MENADŽMENT

I GODINA

I Semestar

- Savremeni menadžment
- Liderstvo
- Inovacije i preduzetništvo

II Semestar

- Elektronsko poslovanje
- Upravljanje znanjem
- Operativni menadžment

II GODINA

III Semestar

- Upravljanje finansijskim rizikom - Izborni
- Finansijski menadžment - Izborni
- Menadžment u javnom sektoru- Izborni
- Finansijska tržišta i institucije - Izborni
- Upravljanje rizikom - Izborni
- Upravljanje tehnološkim inovacijama - Izborni

(Studenti biraju tri izborna predmeta)

IV Semestar

- Praksa
- Završni rad