Achieving Dynamic Stability of Organization in Knowledge Economy

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Download date / Datum preuzimanja: **2024-12-29**

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JOURNAL
OF SUSTAINABLE DEVELOPMENT

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Contents

ACHIEVING DYNAMIC STABILITY OF ORGANIZATION IN KNOWLEDGE ECONOMY

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ABSTRACT

The growth and development of modern organizations are based on knowledge, knowledge production and constant investment in human capital. Changeability of the competitive environment and prevalace of the economy of knowledge over the traditional economy requires searching for a new type of stability. Survival in the market arena and the success in adjusting to changes in the global competitive environment are reflected in the ability of the organization to achieve dynamic stability. The main purpose of this article is to explore the role of learning in the accumulation of human capital in order to achieve the dynamic stability of the organization in the conditions of knowledge economics. The working hypothesis is: The long-term sustainable dynamical stability of the organization can be achieved through the constant accumulation of human capital. Scientific research methods applied in order to confirm the working hypothesis are the methods of analysis and synthesis, method of mathematical modeling and method of mathematical programming.

KEYWORDS: Knowledge economy, dynamic stability, organisation, human capital
JEL CLASSIFICATION: J21, J32, J53, L23

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1. INTRODUCTION

Economies get labeled according to the work people predominately do in them. The industrial economy replaced the agrarian economy when people left farms for factories; then the knowledge economy pulled them from factories to office buildings. When that happened, the way workers added value changed, too. Instead of leveraging their brawn, companies capitalized on their brains. No longer hired hands, they were hired heads (Seidman, 2014). In the new economy, the knowledge of its workforce is the greatest value a company has. These changes are reflected in the increasing relative share of the gross domestic product that is attributable to "intangible" capital (Abramovitz & David 1996). Powell & Snellman (2004) define the knowledge economy as production and services based on knowledge-intensive activities that contribute to an accelerated pace of technical and scientific advance, as well as rapid obsolescence. In the knowledge economy, the knowledge that it is able to harness is the organization's competitive advantage. Unfortunately, very few are able to harness this asset in a meaningful way. Even fewer are organizations that are able to optimize the use oft his important asset (Uriarte, 2008).

Workers in the Knowledge Economy (Lynch, 2003) will have characteristics including: an ability to adapt to constant c hange and uncertainty; capacity to work in knowledge and service based economies; and participate as constructive members in cohesive social communities. Intelligent management that seeks to enhance competitive power of organization is closely related to the construction of continuous multidirectional communication between the management, employees, members, users and all other stakeholders within the organization's environment. All of this has enabled the creation of small, flexible companies, structured on knowledge economy, capable of operating globally with success. Generally speaking, all sorts of businesses are forced to operate in a society that is, for the time being at least, bent towards progressive change, and the only source of competitive advantage is a valid and timely adaptation. Adapting or achieving dynamic stability is only possible when the required efforts to create a learning organization are recognised and made, and when this does not distract from the actuality of current business. In accordance with the subject of research, scientific methods of induction, deduction, and comparative analysis were

applied. Practical example of optimizing remote human resources training is presented using a mathematical and computer-supported model (MS Excel spreadsheet).

2. KNOWLEDGE MANAGEMENT AS A FACTOR FOR DYNAMIC STABILITY OF COMPANY

Companies are open systems (cf. figure 1) which operate according to a number of contemporary trends, such as: 1) globalization, 2) changes in workforce, 3) new employment relations, 4) information technology, 5) values and ethics.

Figure 1. Open-systems perspective of organization
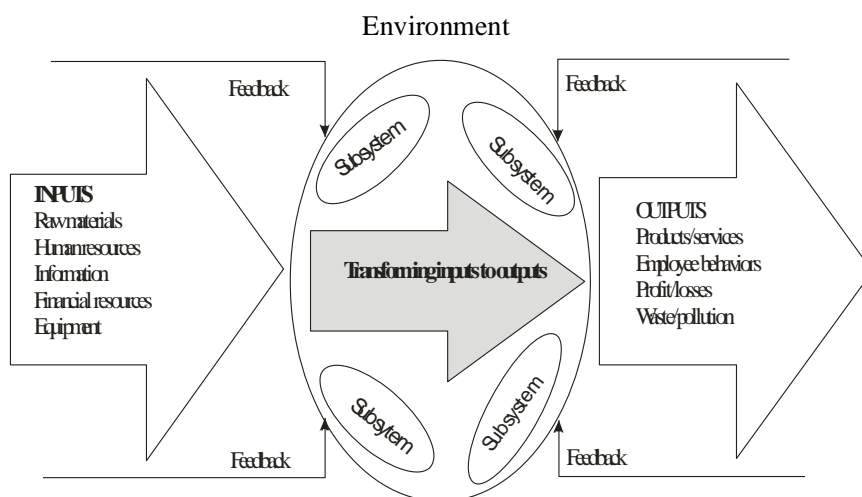
Source: Authors prepared according McShane & Von Glinov (2010), Organizational Behavior, 5th edition, McGraw-Hill/Irwin, New York, p.8.

In order to rise to these challenges, companies need to establish a structure that will enhance the development of human capital and enable efficient knowledge management. Two basic concepts of corporate structure design are: 1) mechanical and 2) organic. Organic structure (team-oriented structure, matrix structure, network structure) is inherent to an environment prone to rapid changes. The organic structure is flexible and adaptable. Coordination is achieved through constant communication and adaptation. There is decentralization of decision-making, and while the employees do have specific tasks, new tasks are continuously introduced, thus continuous knowledge development and teamwork that promotes creativity are established. The capacity to create, transform, organize, share, and apply knowledge is becoming ane

ver more critical apect of competing in complex business environments. According to Albrecht (2003) knowledge deployment is one of the seven key dimension of organizational intelligence (cf. figure 2).

Figure 2. Seven traits of organization intelligence
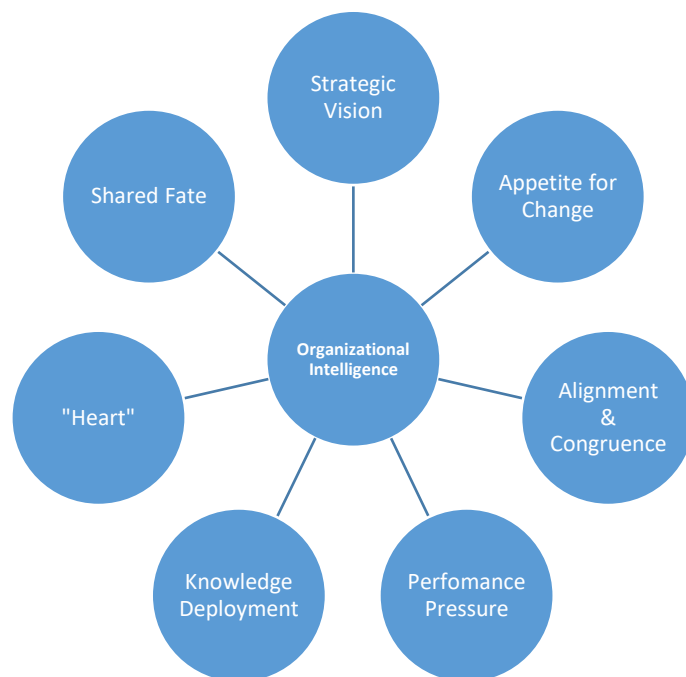
Source: Authors prepared according Albecht, K. (2003). The Power of Minds at Work, AMACOM, NeyYork, p.44

According to the research carried out by Rafajac and Pupavac (2017) in most dimensions of organizational intelligence, small and medium-sized organizations achieve higher results than large organizations in the Republic of Croatia. This research was including 151 enterprises. Organizational intelligence refers to the ability of organizations to engage their members with common purpose, through exchange and sharing of resources, ideas and information at all levels, with the intention of smart integration of available resources and in order to create products and services that increase their competitiveness with respect to the environment in which they operate. The results of empirical research show that there is a statistically significant positive correlation between competitiveness and organizational intelligence ($r = 0.63$, $p<0,01$). In most dimensions of organizational intelligence small and medium-sized organizations achieve better results than large organizations, while organizations in private ownership show signifi cantly higher levels of organizational intelligence than organizations in public ownership.

As far as organizational commitment is concerned, there are significant differences among the three groups, with organizational commitment being the highest in small organizations, and the smallest in large organizations. Regarding the willingness to change, small and medium-sized organizations, show a significantly higher inclination than large organizations, while there are no significant differences between small and medium-sized ones. In the knowledge deployment dimension, small and medium-sized organizations also achieve significantly better results than large organizations, while there is no significant difference between small and medium-sized organizations, similar to the situation in the performance dimension. Process of knowledge management consists of the following three activities: 1) acquiring knowledge - employing people with the necessary knowledge, or taking over entire companies, or learning and experimenting; 2) sharing knowledge - a community of informal group of people linked by professional interest and passion of sharing knowledge and cooperation; 3) use of knowledge – the already existing knowledge should be used to increase the efficiency and effectiveness of an organization. Using knowledge and transfering it to new employees is most successful if it is storaged. Organizational memory is a dynamic storehouse for storing and keeping intellectual capital. It should contain all information and knowledge of its employees, as well as the knowledge embedded in systems and structures of the organization. Also: documents, objects, and every little thing that pertains meaningful information on the workings of organization. Organizational memory needs to be continually expanded and modernized by transferring human capital to structural capital and by abandoning knowledge that no longer contributes to competitiveness of organization. The advantage of structural capital is its ability to work 24 hours a day (Edvinsson, 2003, 141).

Knowledge should be flexible in each stage of the company's business cycle in order to adapt to demands of modern production and the modern market. Company's business cycle model typically reflect a sequential progression thorugh stages such as birth or start-up, growth, maturity and even decline (cf. figure 3).

Figure 3. Company's life-cycle
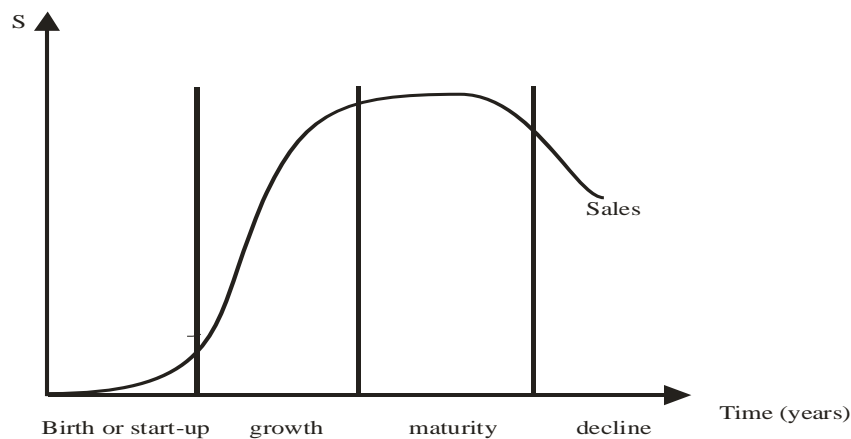
Source: Authors prepared according Rutherford, M., Buller, P., McMullen, P. (2003). Human Resource Management Problems Over the Life Cycle of Small and Medium-Sized Firms, Human Resource Management, Vol. 42. No. 4, p.322

The model of company's life-cycle enables the concept of strategic human resource analysis to develop, and that is related to company's development phases up to the stage of maturity; it is also important in sustaining the company in the stage of maturity for as long as possible, and in preventing its degradation. Human resources predictions using the life-cycle model are focused more on the profile and less on the number of needed workers/managers, and at each stage of its development, the company needs full integration of human resources. Dess & Lumpkin (2003., 118) argue that to be successful, organization must continually enhance their human capital through three HRM activities: hiring/selcetion (including recruiment and selection), development (including training, employee invloment, and performance appraisal), and retention (inluding compensation and stimulating wrk environment). Traning problems are highest in the high growth stage.

Predicting the number of employees by using the life-cycle model helps to determine the future qualification structure of employees (Pupavac, Zelenika, 2004), the future structure of employees by basic categories (senior, middle, lower managers, experts and specialists, engineers, production workers), the future age of employees, the future sexual structure of employees, all in the function of achieving dynamic stability.

3. LEARNING AND ACHIEVING OF DYNAMIC STABILITY

If businesses are to achieve their business goals, an organized learning activity should be initiated within. Learning companies are able to adapt to changes in their environment, but also to initiate changes that have a competitive advantage. Accordingly, learning should be seen as a long-lasting, continuous process that positively affects the income growth and productivity of employees. Investing in learning increases the value of companies and employees. This is why companies increasingly train their employees by helping them develop their full potential, that is, the funds allocated for education of employees have been growing rapidly (cf. figure 4).

Figure 4. Market size of the global workplace training industry from 2007 to 2017 (in billion U.S. dollars)
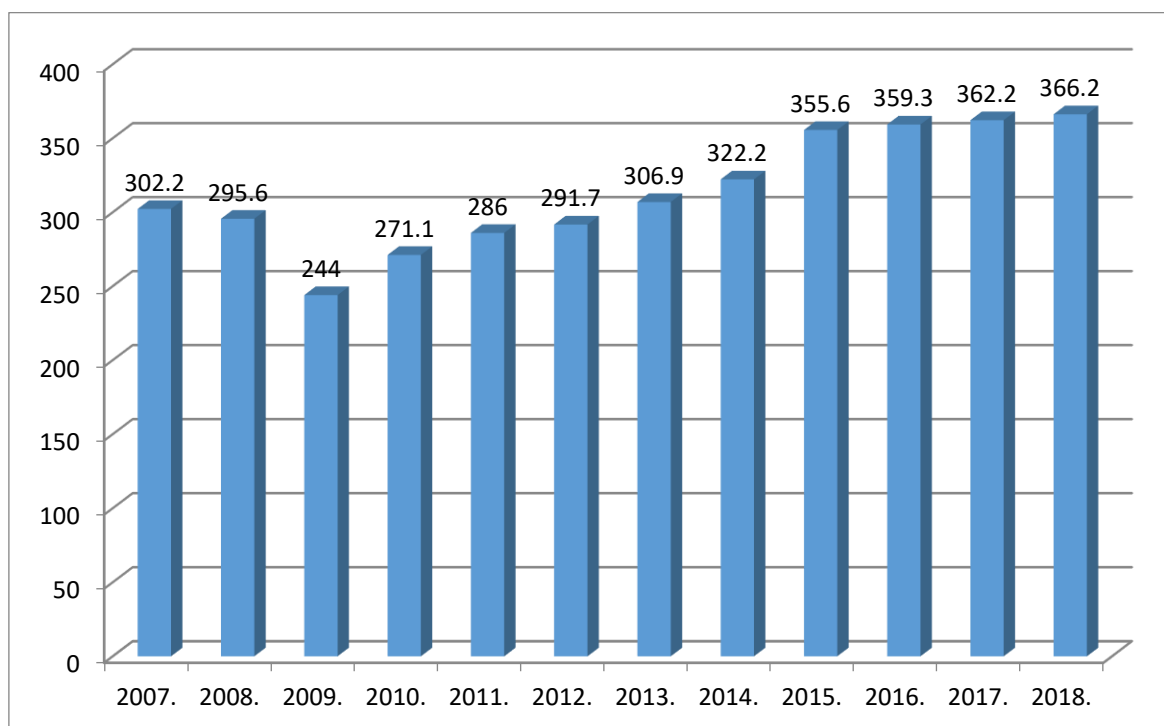
Source: Mazareany, E. (2019). Spending in the global workplace training industry 2007-2018. (available at: https://www.statista.com/statistics/738399/size-of-the-global-workplace-training-market)

In 2017, corporations estimated spending around 362.2 billion U.S. dollars on corporate training initiatives worldwide or 48,44% more than in 2009. According to the Training Industry Report (2016), an average training cost per employee 2016 comes to $1,041.

Learning is a relatively permanent change in behaviour (or a behavioural tendency) that results from the interaction of an individual with the environment. By adjusting their behavior in the work process, employees become responsible and productive. Working helps them achieve certain goals (pay, independence). In order to achieve those goals, they repeat their behaviour. If the behaviour has caused a negative effect, the repetition is absent.

There are two types of knowledge that employees need to be successful at workplace: 1) explicit knowledge and 2) tacit knowledge. Explicit knowledge comprises anything that can be codified, documented and archived. These include knowledge assets such as reports, memos, business plans, drawings, patents, trademarks, cusotmer lists, methodologies, and the like. In many organizations these knowledge assets are stored with the help of computers and information technology, so that can easily be transmitted from one person to another. Tacit knowledge is personal. It is stored in the heads of people. It is accumulated thorugh study and experience. It is difficult to formalize, record or articulate. Tacit knowledge can be shared and communicated thorugh various activities (workshops, conversation, job training) and mechanisms (email, groupware, instant messaging). For example, airline pilots learn to operate commercial jets more by watching experts and practicing on flihts simulators than by attending lectures (McShane & Von Glinov, 2010). The sharing of tacit knowledge is a great challenge to many organizations.

Personal knowledge can become organizational knowledge through the dynamic interaction between tacit knowledge and explicit knowledge. This dynamic process is the essence of knowledge creation in an organization. This interaction between the two types of knowledge bring about what is called the four modes of knowledge conversion (Nonaka, 1996).

Table 1. Interaction between tacit and explicit knowledge

	To tacit knowledge	To explicit knowledge
From tacit knowledge	Socialization	Externalization
From explicit knowledge	Internalization	Combination

Source: Uriarte, F. (2008). Introduction to Knowledge Management, ASEAN Foundation, Jakarta, Indonesia, p. 7.

Socialization is a process of creating common tacit knowledge through shared experiences. To start socialization, we need to build a "field" of interaction, where individuals share experiences at the same time and space, thereby creating common unarticulated beliefs or embodied skills. Young apprentices work with old master craftsmen, thereby acquiring technical skills through observation, imitation, and practice. **Externalization** is a process of articulating tacit knowledge into such explicit knowledge as concepts and/or diagrams, often using metaphors, analogies, and/or sketches. This mode is triggered by a dialogue intended to create concepts from tacit knowledge. Creating a new product concept is a good example of externalization. **Combination** is a process of assembling new and existing explicit knowledge into a systemic knowledge such as a set of specifications for a prototype of new product. **Internalization** is a process of embodying explicit knowledge into tacit, operational knowledge such as know-how. This mode is triggered by "learning by doing or using."

4. OPTIMIZATION OF REMOTE HUMAN RESOURCES TRAINING INTRODUCTION

If you were an employee on Henry Ford's assembly line in Detroit in the 1920s, you received a high degree of training and preparation before you ever set foot in the factory. You learned what your role was, and were given all the tools you needed to accomplish your job from Day One. From then on, your role never changed—you did your part to move a product forward along the assembly line, from the day you began until the day you retired, 40 or 50 years later. Since those days, the business world has transformed — everything that can be automated has been automated. Today, we are in the knowledge economy, and there is new knowledge we are required to learn and apply daily (Mehta, 2016). Flexibility and adaptability, as core determinants of modern businesses, are grounded in human resources, the only dynamic element of a company.

The dynamics of human resources is achieved through continuous education, so that human resources become the core capital, source of strength and success of modern businesses. Well-trained employees are essential to the success of any company. The right training program will have increase employee engagement**,** retention, and productivity; it decreases the need for supervision, reduces absenteeism, improves customer service, and boost sales. Numerous

companies are becoming aware of continuous education and training of human resources as one of the most effective ways of creating and maintaining competitive advantages. In the new economy, intelligent companies win, learning companies, companies that truly believe in people and their knowledge as the most valuable asset. Intelligent companies are those that systematically collect information from the environment, turn them into knowledge, incorporate that knowledge into their organizational structure, and finally react adequately to threats and opportunities that are arising from the environment. Learning companies are able to adapt to changes in the environment, but also to simultaneously initiate changes that can serve as their competitive advantage. Thus, knowledge is at the centre of the core of business competence and the problem of full responsiveness to environmental challenges can be approached from the point of acquiring new knowledge and its use.

Proper training has a positive effect on employee and customer retention, sales and overall profitability. Training budget will vary based on organization specific business training needs, but typically 2 – 2.5% of the company's budget allocated to employee training is considered standard [Andriotis, 2017]. Training budget is a way to ensure that employees has the skills and competencies required to complete tasks up to the required standard of quality. The question becomes how to optimize training costs and how to maximize the return on training costs. Accordingly, in the follow-up, a mathematical and computer-supported model of the optimal organization of remote human resources training is presented.

Due to introduction of new robotized equipment, a manufacturing company is to send 10 Z_1 candidates to additional training abroad, 24 Z_2 candidates and 16 Z_3 candidates. As robotized equipment is acquired abroad, the supplier, cooperating with two large manufacturing companies where new equipment has been successfully implemented more than a year ago, offered an additional training program. As the obligation for an additional training program was not included in the purchase agreement, the supplier, in cooperation with the manufacturing companies submitted the following offer (see Table 2).

Table 2. Costs for additional training of workers in three required occupations (in €)

Occupation Manufacturing company	Z_1	Z_2	Z_3
Manufacturing company I	500	800	1 000
Manufacturing company II	400	750	1 200

Both manufacturing companies can undertake additional training for the three required occupations, but due to the volume of work within the required period, the Manufacturing Company I can receive a maximum of 30 candidates and the Manufacturing Company II 20 candidates. Thus the manager of human resources is faced with the problem of organizing additional training of employees abroad, with minimal training costs.

Mathematical model:

$f = 500x_1 + 800x_2 + 1000(30 - x_1 - x_2) + 400(10 - x_1) + 750(24 - x_2) + 1200(x_1 + x_2 - 14)$

$= 300x_1 + 250x_2 + 35200$

To determine

$(\min) f = 300x_1 + 250x_2 + 35200$

With constrains

$x_1 + x_2 \leq 30$

$x_1 \leq 10$

$x_2 \leq 24$

$x_1 + x_2 \geq 14$

with the condition

$x_1, x_2 \geq 0$

Intelligent managers use computers to optimize the costs of human resource training. Accordingly, a computer-supported model with a view to addressing the problem is presented below. A model for resolving this problem is set in the following spreadsheet (cf. Table 3).

Table 3. Spreadsheet model for organizing additional employee training

	A	B	C	D	E	F	G
1			Number of	Number of			
2			possible candidates	sent candidates			
3		MC_I	30	0	0	0	0
4		MC_II	20	0	0	0	0
5					0	0	0
6					10	24	16
7							
8					Z1	Z2	Z3
9					500	800	1000
10		Total			400	750	1200
11		training costs	0		0	0	0

The costs for additional training of workers in three required occupations are put in the table in address area E9:G11 for training in Manufacturing company I and in addres area E10:G12 for training in Manufacturing company II. The maximum number of employees that each company can take can be found in the address fields C3 and C4. The number of candidates to be trained for a particular occupation has been entered in the address fields E6, F6 and G6. The formula = SUM (E3: G3) which calculates the number of workers to be sent for training in MC_I is glued to the address field D3 and the formula = SUM (E4: G4) which calculates the number of workers to be sent for training at MC_I is glued to the address field D4I. The training costs for each individual occupation are calculated in the address area E11: G11. First of all, the formula = SUMPRODUCT (E3: E4; E9: E10) is glued to the address field E11 and then copied to the rest of the address area. The total training costs are calculated as the sum of the individual costs in the address field C11 where the formula = SUM (E11: G11) is glued. Then the address area E3: G4 is necessary to book where the initial null values must be entered. These are at the same time a decision-making variables which will include the answer to the question how many workers and what occupations they would be trained for in MC_I and MC_II.

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In Tools menu we choose programme Solver and start to fill in the data in the Solver Parameters as shown:

Target Cell: C17

Equal to min

By Changing Cells: E3:G4

Subject to the Constrains:

E3:G4 =integer

E3:G4 ≥ 0

D3:D4 ≥ C3:C4

E5:G5 =E6:G6

When all the data is filled in, we click on the solve button in solver parameters. This will activate solver programme to calculate decision variable values in address sequence E3:G4. Decision variables that are calculated in address sequence E3:G4 define the optimal solution. Table 4 shows the optimal solution to the problem by using MS Excel.

Table 4. Optimal training program for workers in foreign production companies

	A	B	C	D	E	F	G
1			Number of	Number of			
2			possible candidates	sent candidates			
3		MC_I	30	30	0	14	16
4		MC_II	20	20	10	10	0
5					10	24	16
6					10	24	16
7							
8					Z1	Z2	Z3
9					500	800	1000
10		Total			400	750	1200
11		training costs	38700,00		4000	18700	16000

Using optimal training program for workers abroad, 10 Z_1 candidates and 10 Z_2 candidates are to be sent to the MC_II manufacturing company, while 14 Z_2 candidates and 16 Z_3 candidates should go to the MC_I manufacturing company. The minimum

cost of training amounts to €38,700. The obtained results offer savings of € 4,500. This savings are very important because ensure carefully managed training budget needs.

5. CONCLUSION

In the knowledge economy companies should improve its capacity to acquire, share and use knowledge in ways that improve its survival, success and ensure dynamic stability. This process is possible only with the development of the organization learning concept. Organizational learning means that companies establish systems, structures and organization values that support the knowledge management proccess. Employees need to recognize that it is essentaial for them to continue to learn so that they will be effective in their current jobs and to move into other positions. There are two types of knowledge that employees need to be successful at workplace: 1) explicit knowledge and 2) tacit knowledge. Personal knowledge can become organizational knowledge through the dynamic interaction between tacit knowledge and explicit knowledge. Creating, acquiring and effectively developing knowledge within an organization has become the core source of competitive advantage. That is a reason why companies are getting more interested to invest in people, knowledge and learning. Dynamic business environment requires continuous investment in the training process and employee development, as well as the need to optimize the resources used for this purpose. The funds for education of employees are growing rapidly, indicating the companies commitment to improving the process of acquiring knowledge, skills and other competence. Future research should continue to examine human capital isuess as a factor of achieving dynamic stability in different stage of company's business cycle in SMEs and large enterprises.

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ACKNOWLEDGMENTS