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Impact of the Educational Attainment of the Knowledge Management Process in Serbian Textile Enterprises

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Abstract

This paper emphasizes the importance of proper management of employees' characteristics through their obtained education i.e. their educational attainment, on the development and application of knowledge management, and therefore on the productivity and competitiveness of the business. The study focuses on whether and to what extent human resources through socio-demographic characteristics have a decisive role in the successful implementation of the knowledge management program in textile enterprises in Serbia, as well as which segments i.e. dimensions, can be affected. Research goals are directed towards determining the impact of the educational attainment of respondents (independent variable) on the dimensions of knowledge management (dependent variable). The sample of respondents consisted of N = 336 employees from 83 textile companies in Serbia. Significant results were seen in the dimensions of the organisational culture (0.050), the process of knowledge acquisition (0.013) and competitive advantage (0.021). Adequate selection of human resources can influence the above-mentioned organisational units in the enterprise. Investment in both the intellectual capital of human resources and in all technological processes and resources at all levels would allow knowledge management to be fully implemented in enterprises and to improve the textile industry in Serbia.

Key words: *knowledge management, social characteristics, organisational culture, acquisition process, competitive advantage, Serbian textile enterprises.*

Introduction

As a developing country Serbia is in a constant race with the world economy in all spheres of industries, not to mention the textile industry. The poor financial situation of small and medium-sized enterprises affects the insufficient application of appropriate technology, which is reflected in the stagnation of the textile industry in our country. Investing in knowledge and sharing thereof can replace these weaknesses and affect an innovative way of business dealings and finding creative alternatives. Adequate knowledge sharing at all levels in the enterprise is focused on innovative collective efficiency, focused on business productivity and influences raising the productivity of the textile industry to a higher level. The shaping and directing of knowledge through the segments which we can affect allows us to manage the final product from the very beginning of the production cycle. Therefore knowledge sharing is the only way to establish innovative organisation. Contemporary business conditions require companies to rapidly change, adapt and constantly improve. On a growing and dynamic market, existence, growth and development can be achieved by companies that can obtain the required knowledge, information and technology on time. These are usually the most needed resources for growth and development and for reaching the objectives of enterprises. It is not rare that enterprises do not have all these resources, and in contemporary business conditions they obtain them on the basis of international transfer. International trade provides faster and easier transfer of technology and knowledge between countries in different parts of the world. This way of functioning and business dealing of enterprises i.e. the transfer of technology and knowledge, brings the company a number of benefits and it facilitates its development path [17]. An organisation which is flexible quickly adapts to environmental changes and adopts knowledge quickly. The key to success is to establish an organisational culture in which every employee feels it is not a duty but a need for the constant innovation of their own work. With this approach, employees will secure their jobs and as well as ensure a competitive advantage and existence in the market for the company they work for. The continuous improvement of knowledge and work productivity is the basic imperative of the modern economy and is certainly the most significant factor in the competitive struggle of enterprises on the global market. These assumptions should be incorporated into the business policies of each organisation. Education and knowledge are the new factors of competitiveness. The essence and source of competitive advantage is knowledge, quality and, of course, people. The role of human resources is reflected in their responsibility to take radical measures for their progression and adaptation. In contemporary business, which is based on the principles of modern and attractive principles observed at the global level, quality solutions should be sought in the operational management and evaluation of social, psychological, philosophical, economic and other aspects, as key links between science and economy.

Methodology

The subject and the problem of the research

In Serbia, which is a developing country, the textile industry needs to be based on modern and attractive principles that are focused on the evaluation of social, psychological, philosophical, economic and other aspects, as key links between science and the economy. Hence this paper emphasizes the importance of proper management of the characteristics of employees through their knowledge obtained i.e. educational attainment, on the development and application of knowledge management, and therefore on the productivity and competitiveness of the business. The study focuses on whether and to what extent human resources through socio-demographic characteristics have a decisive role in the success of the implementation of a program of knowledge management in textile enter-

prises in Serbia, as well as which segments i.e. dimensions, can be affected. The subject of the research is to define the key dimensions of knowledge management as well as variables that affect the dimensions of knowledge management, which are presented as dependent variables.

Research goals

The aim of the research is based on the reviewing of the presence of the implementation of knowledge management, including human resources as indispensable in the realization and application of the knowledge management concept. The practical goal of this research relates to the current situation and analysis of the characteristics and features of human resource management in textile enterprises in Serbia. Its goal is also to predict the state and possibilities for improvement of the textile industry in Serbia by applying knowledge management and by shaping the organisational context, i.e. environment as a precondition for the successful implementation of this program.

Theory and research questions

In general, companies coming from transitional countries, Serbia among them, have problems with the quality of their business and production productivity. An inherited inefficient production system as well as transitional recession, common for all countries in transition, influence those companies and may be blamed for their insufficient competitive capacity. Serbian companies have been uncompetitive on the international market for a long period of time. Old technology, poor quality, unattractive packaging and high prices generally slow the response to market demands and are the main reasons for the un competitiveness of Serbian products. The least competitive are the textile and manufacturing industries, as well as the metal industry and electronics, in which there has been no technological reconstruction for years. The average machine age in Serbia is 30 years. Comparing to the situation in the region, this is a delay of about 12 years. The greatest backwardness was noticed in textile companies (35 years), then in the machine industry (34.5 years) [25].

Brenton et al. suggest a number of reasons why the clothing sector has played such an important role in economic development. The sector absorbs large numbers of unskilled labour, typically drawing it from rural agricultural households to industrial locations. Despite relatively low start-up investment costs, the expansion of the sector provides a base upon which to build capital for more technologically demanding activities in other sectors. The growth of the sector allows imports of more advanced technologies to be financed through revenues gained from garment exports [4], [11].

The contemporary market of textile enterprises in Serbia, especially during the economic crisis, is characterised by unfavorable aspects which are reflected in the poor positioning of textile enterprises in the global market as well as in reduced competitiveness, lack of technology, lack of staff training, lack of standards, and others. Even before the outbreak of the economic crisis, this sector had the lowest average net salary in Serbia and had difficulties in operating because of the great unfair competition (the grey economy in the textile sector was 44% at the national level, and in the south of Serbia 50.5% of the total turnover) [13]. There is a good chance that production will continue to grow in this sector of economy and that it will overcome the economic crisis, but it is necessary to suppress the grey economy in the area, reduce taxes and accelerate cash flow and debt collection in order to prevent the collapse of enterprises in textile manufacturing. According to Prenll et al., Serbia's textile and garment industry is ideally placed for short lead-time smaller production runs in response to shifting fashion trends. Moreover the proximity to both fashion centers like Paris, Milan or Rome, and major retail markets lends sensitivity to market trends, speed to the market, and reduced transportation costs [21].

The textile industry is a very important industrial sector because it produces clothing for seven billion people and textile materials for technical purposes. It is internationally connected, belongs to the traditional manufacturing sector, and employs a large number of cheap and qualified, mostly female, lab our forces. It is very demanding technically and technologically. To meet these demands, it is necessary to employ a qualified, competent workforce which possesses the necessary competencies, knowledge and skills and is willing to meet all the challenges that are imposed in conditions of large fluctuations and rapid changes in the market [26].

Intellectual capital has become the most important resource for wealth creation and national progress [3], even more than the tangibles [19]. In the current social and economic context, termed the knowledge economy, knowledge and information are the core competencies of nations [12] pursuing development, above capital [22] or labour [7]. Knowledge is an essential asset for the new economy, the knowledge economy. Empirical works show a strong relationship between intangible assets and national economic development [27]. In addition, intangibles positively affect work productivity [9] and provide the future profits of countries and their organizations [15, 2]. Argues that leaders of national economies are trying to find reliable ways for measuring knowledge assets to understand how they relate to future performance [2]. Such knowledge measurements can help governments manage the intangible resources that increasingly determine the success of their economies. Approaching economic development from a knowledge perspective, that is, adopting policies to increase a nation's intellectual wealth, can improve people's lives in a number of ways [28]. Knowledge assets are the intangible assets of a country, and they have significant implications for future national values, as they represent the source of the competencies and capabilities deemed essential for national economic growth, human development, and quality of life [15]. As a result, countries rich in intangible assets fare better in terms of national wealth than those whose assets are limited to land, tools, and labor [15, 21]. The measurement of intangible assets assists nations in analyzing and benchmarking their competencies and capabilities [15].

In the textile industry of Serbia, a common problem concerning incompetent employees is connected with inadequate knowledge and skills for working within the workplace, a longer period of time necessary to adapt and understand the job, unwillingness to work in teams, a lack of business and entrepreneurial skills and knowledge, a lack of communication and problem-solving skills, discordance between theoretical and practical knowledge and skills, lack of new technology skills, ignorance of quality system, etc. [14].

Therefore this paper shows and emphasises the importance of the proper management of the characteristics of employees through their obtained knowledge i.e. educational attainment, for the de-
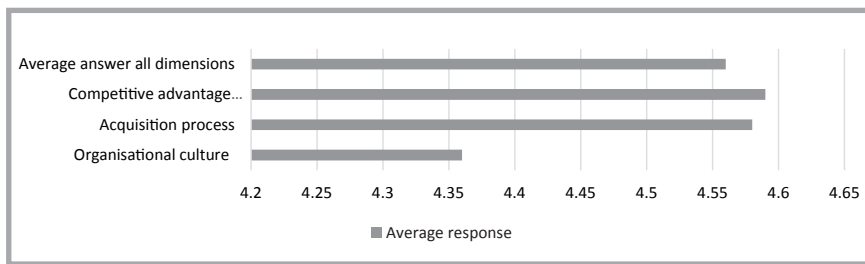
Figure 1. Average value of responses by dimension of knowledge management.

velopment and application of knowledge management and, consequently, for the productivity and competitiveness of the business.

Based on the theory analysed, the problem of this research can be presented through the following questions:

- Q1 – To what extent the textile enterprises in Serbia apply knowledge management through defined dimensions?
- Q2 – Does the educational attainment of respondents affect the dimensions of knowledge management?

Research method

As a starting point in this study, the implementation of knowledge management was observed through nine dimensions [18]. The constructs of the theoretical model are latent, among which social KM infrastructure capability (identified by the three dimensions of structure, culture and people) and KM process capability (identified by the four dimensions of knowledge acquisition, conversion, application, and protection processes) were deemed to be second-order latent constructs, derived from the social KM infrastructure and KM process sub-dimensions, respectively. Nine first-order latent constructs were measured by multi-items to improve the reliability and validity of the measurements with the use of the seven-point Likert-type scale anchored by 1 (strongly disagree) and 7 (strongly agree) to provide the advantage of standardising and quantifying relative effects. In addition, Hair et al. suggest that due to the identification issue, each construct should be measured by at least three indicators. The following section discusses the item measurements for each variable of interest, seven of which (including structure, culture, information technology, acquisition, conversion, application, and protection) are based on the work of Gold, Malhotra and Segars

and Smith [8], while the variable of people (or T-shaped skills) is adapted from Lee and Choi and competitive advantage from Chuang [6], leading to a list of 50 candidate measurement items. The dimensions of knowledge management were taken as dependent variables, and as an independent variable, educational attainment of the respondents was taken with the following sub variables: I elementary education, II semi-qualified worker, III qualified worker, IV secondary education (4 years), V highly-qualified worker VI (VII and VI2), higher education (university level I) VII1, and higher education VII2 master's degree.

The methods that were used are the analytic-synthetic method, content analysis, expert methods of scientific research (survey for data collection), and methods of statistical data analysis (analysis of variance), i.e. a series of t-tests for independent samples were used i.e. a series of one-way analysis of variance. The data obtained were processed in IBM SPSS Statistics 22 and as an indicator of the validity i.e. significant correlation, a limit of less-than or equal to Sig ≤ 0.05 was taken.

Research organization

The research lasted for 9 months, from the 1st of June 2015 until the 1st of February 2016, and during this period the research and collection of adequate literature and responses to the questionnaires were conducted. The sample of respondents consisted of employees in textile enterprises in Serbia, with the sample unit being N = 336 respondents. The sample consisted of employees at all hierarchical because it is considered that each individual may contribute to the development of management skills to some extent.

This study adopts a positivist or quantitative paradigm and uses a deductive approach to empirically test the relationships among the variables identified in

the theoretical model. The data collected were initially assessed for missing values, sample description and normality testing using Statistical Package for Social Sciences (IBM SPSS Statistics) version 22, with a final number of 336 responses. Step one was to conduct a confirmatory factor analysis (hereafter referred to as knowledge management capability and competitive advantage construct validity. The data analysis and interpretation of findings are presented in detail in results and discussion.

This empirical study was only conducted in Serbia, a European country where dominated by a Slovene culture, a socialist market economy and SMEs. It is argued that the cultural, economic and political business environment of a country can strongly impact an organization's KM infrastructure capabilities and, in turn, support and determine its KM process capabilities. Thus further cross-validation studies in other contexts would strengthen the generalisation of the research.

Result and discussion

In order to have a clearer perception of the results obtained, hereinafter only the results that are statistically significant at the level of Sig ≤ 05 will be presented in tabular form, i.e. dimensions which are affected by educational attainment. The results will be shown through the analysis of variance and descriptive statistics of significant dimensions with a theoretical contribution. Based on the questionnaire carried out on the dimensions of knowledge management, the average of the answers given by dimensions was calculated. In order to perceive the extent to which the concept of knowledge management is applied in practice, we analysed through which dimensions respondents' education has an impact. To have a clearer perception, hereinafter are shown only the average value of responses of dimensions in which the influence of respondents' educational attainment is notable, as well as the average responses of all dimensions. The ranking of responses for dimensions that have achieved significant results are shown in *Figure 1*, as well as the average response of all dimensions. Dimensions which are influenced by professional education are as follows: competitive advantage (4.59), the procurement process (4.58) and organizational culture (4.58). The average value of responses for all dimensions is 4.56,

thus it can be noted that the application of knowledge management dimensions is not fully developed and implemented in textile enterprises in Serbia. Although Serbia is a country whose economy is still in the process of development, it is a positive fact that research results are not negative; however, it is important to point out that further investment is necessary for intellectual capital of human resources and in all technological processes and resources at all levels in order to fully implement knowledge management.

Organisational culture

The impact of educational attainment of respondents on the organisational culture dimension is presented in *Table 1*, where we see that F (7.76) = 2.078, p < 0.05, while Sig. Is 0.050. While a descriptive analysis of the impact of the educational attainment of respondents on the organisational culture dimension is shown in *Table 2*. This can help to conclude that the influence of professional qualifications is on the limit, given the fact that 0.05 is both the result and limit value. Adjustment of the organizational structure according to educational attainment should be carefully carried out.

The role of organisational culture as a source of SCA has also been strongly stated in the literature. Barney concludes that 'firms that do not have the required cultures cannot engage in activities that will modify their culture and generate sustained superior performance because their modified culture typically will be neither rare nor imperfectly imitable' [1]. Moreover he adds that organizations which have a culture that supports and encourages cooperative innovation should try to understand what it is about their culture that gives them a CA and develop and nurture those cultural attributes [1]. Similarly Hibbard [9] argues that strong culture is a determinant of organisational performance and organisations to remain competitive, and they must be able to utilise their knowledge of customers, products, services and resources; or in other words, they must be able to overcome cultural barriers in knowledge sharing [26]. According to Gold, Malhotra and Segar, the most significant hurdle to effective KM is organisational culture [8], which is defined according to McDermott and O'Dell as 'the shared values, beliefs and practices of the people in the organisation' [16]. Relying on the important components of organisational culture, including employee interaction,

corporate vision, and senior management support, Gold, Malhotra and Segar [8] developed a thirteen-item measure of this construct, which was refined by Chuang [6] and Smith [23] in different contexts. Smith's six measure items of the organisational culture variable are adopted in the current study [23].

Table 1. *ANOVA impact of respondents' educational attainment on the dimension of organisational culture.*

		Sum of squares	df	Mean square	F	Sig.
Organisational culture	Between groups	532.236	7	76.034	2.078	0.050
	Within groups	2780.467	76	36.585		
	Total	3312.702	83			

Table 2. *Descriptive analysis of the impact of respondents' educational attainment on the dimension of organizational culture.*

		N	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
						Lower limit	Upper limit		
Organizational culture	I elementary education	4	7.00	.	.	.	.	7	7
	II semi-qualified worker	8	8.50	6.364	4.500	-48.68	65.68	4	13
	III qualified worker	20	12.80	8.526	3.813	2.21	23.39	4	24
	IV secondary education (4 years)	96	17.67	5.223	1.066	15.46	19.87	4	28
	V highly-qualified worker	24	21.50	5.505	2.247	15.72	27.28	15	28
	VI (VII and VI2), higher education (university level I)	32	15.75	6.671	2.358	10.17	21.33	4	26
	VII1, higher education	128	18.38	6.479	1.145	16.04	20.71	4	28
	VII2 master's degree.	24	18.33	3.386	1.382	14.78	21.89	14	22
	Total	336	17.44	6.318	0.689	16.07	18.81	4	28

Acquisition process

The impact professional qualifications of respondents on the dimension of the procurement process is shown in *Table 3*, where we see that F (7.76) = 2.776, p < 0.05, while Sig. is 0.013. Descriptive analysis of the impact professional qualifications of respondents on the dimension

Table 3. *ANOVA impact of respondents' educational attainment on the dimension of the acquisition process.*

		Sum of squares	df	Mean square	F	Sig.
Acquisition process	Between groups	1434.913	7	204.988	2.776	0.013
	Within groups	5612.075	76	73.843		
	Total	7046.988	83			

Table 4. *Descriptive analysis of the impact of respondents' educational attainment on the dimensions of the acquisition process.*

		N	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
						Lower limit	Upper limit		
Acquisition process	I elementary education	4	32.00	.	.	.	.	32	32
	II semi-qualified worker	8	8.50	3.536	2.500	-23.27	40.27	6	11
	III qualified worker	20	20.60	12.562	5.618	5.00	36.20	8	36
	IV secondary education (4 years)	96	28.67	6.578	1.343	25.89	31.44	18	42
	V highly-qualified worker	24	31.17	9.347	3.816	21.36	40.98	18	42
	VI (VII and VI2), higher education (university level I)	32	32.50	8.106	2.866	25.72	39.28	23	42
	VII1, higher education	128	27.69	9.842	1.740	24.14	31.24	7	42
	VII2 master's degree.	24	22.67	3.830	1.563	18.65	26.69	18	29
	Total	336	27.49	9.214	1.005	25.49	29.49	6	42

Table 5. ANOVA impact of respondents' educational attainment on the dimension of competitive advantage.

		Sum of squares	df	Mean square	F	Sig.
Competitive advantage (through intensely satisfying of customers' needs)	Between groups	509.124	7	72.732	2.549	0.021
	Within groups	2168.435	76	28.532		
	Total	2677.560	83			

Table 6. Descriptive analysis of the impact of respondents' educational attainment on the dimension of competitive advantage.

		N	Mean	Std. devia-tion	Std. error	95% confidence interval for mean		Minimum	Maximum
						Lower limit	Upper limit		
Competitive advantage (through intensely satisfying of customers' needs)	I elementary education	4	9.00	.	.	.	.	9	9
	II semi-qualified worker	8	7.00	4.243	3.000	-31.12	45.12	4	10
	III qualified worker	20	16.20	7.225	3.231	7.23	25.17	6	24
	IV secondary education (4 years)	96	19.29	3.665	.748	17.74	20.84	12	28
	V highly-qualified worker	24	21.17	5.307	2.167	15.60	26.74	12	28
	VI (VII and VI2), higher education (university level I)	32	20.88	4.357	1.540	17.23	24.52	14	28
	VII1 higher education	128	18.22	6.573	1.162	15.85	20.59	4	28
	VII2 master's degree	4	16.50	1.975	0.806	14.43	18.57	13	18
	Total	336	18.37	5.680	0.620	17.14	19.60	4	28

of the procurement process is shown in *Table 4*. By this, we can conclude that with the adequate selection of human resources we can influence the knowledge procurement process, and therefore the application, which results is the improvement of business of textile enterprises.

Knowledge acquisition refers to the ability to seek and acquire entirely new knowledge or create new knowledge from existing knowledge through collaboration [10]. This study adopts the six measure items of this construct from Smith [23], who refined Gold, Malhotra and Segar's [8] scale measurement in the context of a developing country.

Competitive advantage through intensely satisfying of customers' needs

The impact of educational attainment of respondents on the dimension of competitive advantage (intense satisfying of customers' needs) is shown in *Table 5*, where we see that F (7.76) = 2.549, p < 0.05, while Sig. is 0,021. Descriptive analysis of the impact of educational attainment of respondents on the dimension of the procurement process is shown in *Table 6*. From this we can deduce that the impact is very good. The influence that management can have on the labour force through its selection can raise customer satisfaction to a higher level, and

thus influence the competitive advantage of companies.

Competitive advantage is considered the objective of strategy according to Porter [20] and is described as the unique position that an organization develops over its competitors by employing its resources [9]. Using the multi-dimensions of the construct defined by Byrd and Turner [5], including innovativeness, market position, mass customisation, and difficulty in duplicating, Chuang [6] developed a scale to measure a firm's CA which is adopted in this study.

◼ Conclusions

The empirical results of analysis of data collected from 336 usable responses confirmed that the model is workable in the context of Serbia, an emerging less developed country. In Serbia, as well as in developed countries, the KM capability of a firm is a multi-dimensional construct composed of social KM infrastructure capability, technical KM infrastructure capability, and KM process capability. Social KM capability is identified by three dimensions, including culture, structure and people (or T-shaped skills). After the research, established was which dimensions of knowledge management are affected by the respondent's educational

attainment in Serbian textile enterprises. Competitive advantage Sig 0.021, procurement process 0.013 Sig and organisational structure Sig 0,050 stand out as dimensions that can be modelled through an adequate selection of the labour force in the textile industry (Q2). Given that the average response of all dimensions is 4.56, it can also be concluded that the application of the knowledge management dimension is not fully developed and applied in textile enterprises in Serbia. Given the fact that Serbia is a country whose economy is still developing, it is a positive fact that the. research results are not negative. It is important to point out that further investment is necessary for both the intellectual capital of human resources as well as for all technological processes and resources at all levels in order to fully implement knowledge management (Q1). Social and technical KM infrastructure capabilities are strongly correlated. They are both enablers for KM process capabilities with social elements of dominant influence through employees with educational attainment. KM processes as dynamic capabilities, in turn, play a key role in contributing to organisational competitiveness.

As a result, the indirect effects of social and technical infrastructure capabilities on organisational CA are fully mediated through the KM process capability. In addition to theoretical contributions, the study also provides a variety of practical recommendations for business executives, especially those who are operating in Serbia, on how to be successful in applying KM projects to achieve strategic business objectives. Future research can further investigate KM capabilities to develop a deeper insight into particular factors of interest, especially cultural issues, or can explore other factors to provide a more comprehensive picture of the association between organizational KM and CA with employees having educational attainment.

The research showed through which qualifications executive management may affect the formation of a more profitable organisational structure in order to improve the implementation of knowledge management through the highlighted dimensions. It would also be good to examine whether the application of the defined dimension of knowledge management affects employees' job satisfaction and to what extent. A sample of 336 respondents in this study was a starting point for further research and it would

be interesting to check the value of these variables on a representative sample of 800 respondents. With the increase in the number of respondents, it should be compared whether there has been a further significant effect of the defined independent variables on the defined dimensions.

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