Knowledge management and the increase of SME competitiveness: a case study

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KNOWLEDGE MANAGEMENT AND THE INCRESASE OF SME COMPETITIVENESS: A CASE STUDY

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The need to enhance the competitiveness and innovation capacity of small and medium enterprises is one of the key objectives of emerging EU economies. In this regard, the authors define the role of knowledge in enhancing business competitiveness in a regional economy. The effect of knowledge management processes on the economic activity of businesses in the Latvian region of Latgale is considered. To assess the role of knowledge and knowledge management processes, the authors apply integrated metrics calculated with the help of correlation analysis based on a 2013 survey of managers and staff of SMEs in Latgale. An assessment of the role of knowledge and knowledge management processes in SMEs of Latgale region using the SPSS programme shows that the knowledge and experience of employees have is at an average level of development — from 2.9 to 3.6 on a 5 point scale. It suggests the possibility of that the processes of knowledge management are not used to their full capacity at the regional small and medium-sized businesses; therefore, there is untapped potential for enhancing the competitiveness of these enterprises. The study emphasizes the need for regional businesses to interpret new knowledge as a key value for developing the competitive and innovative potential.

Key words: *knowledge, management knowledge, business, region, competitiveness, Latvia*

Introduction. To ensure a correct understanding of the research area, it is necessary to consider several basic notions that are usually used as synonyms but have significant differences. *Data* is an aggregate of facts stored on a certain medium and ready for processing. *Information* is a result of processing and

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analysing data in solving certain problems. *Knowledge* is practically verified processed information that was used and can be used in decision making; it is intellectual capital. Knowledge can be formal, i.e. presented in the form of documents, rules, standards, guidelines, and non-formal, i.e. the knowledge and skills of employees obtained both in training and professional activities. Formal and informal knowledge is necessary for decision making. The results of decisions contribute to knowledge as acquired and accumulated experience. Therefore, knowledge is a result of intellectual activities: "Knowledge is the ability to turn information and data into effective action" [1]. In other words, "familiarity gained by experience; range of information" [2]. Finally, "knowledge is the combination of data and information, to which are added expert opinion, skills, and experience, to result in a valuable asset which can be used to aid decision making" [3]. As an area of management, knowledge management was first mentioned in P. Drucker's book *The Landmarks of Tomorrow* (1956), where he defined a new type of activity — „knowledge work" [4, p. 248].

The term "knowledge management" was first coined in 1986 in Switzerland by Karl M. Wiig in his presentation at a conference of the UN International Labour Organisation. He defined this activity as "systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness" [5, p. 191]. European scholars specialising in knowledge management identify a number of problems in this field. For instance, D. Gilmour stresses low return on investment in knowledge management [6, p. 16—20]. D. Cohen emphasises the problems associated with knowledge work [7, p. 28]. The current situation is largely caused by insufficient attention paid by scholars to the basic theoretical aspects of knowledge management. Many scholars believe that knowledge is the reason behind wealth and prosperity [8—10], as well as a key factor behind the long-term success of enterprises (organisations) [11; 12]. Therefore, an efficient use of knowledge can become a competitive advantage, which will contribute to the sustainable development of an organisation [13; 14]. Therefore, knowledge and its management are of great significance for increasing the competitiveness of businesses, especially small and medium ones, where decision making is associated with uncertainty and unconventional methods. We pursue an applied research objective of identifying the significance of different factors for growing competitiveness of small and medium enterprises of Latvia's Latgale region in the course of knowledge management.

Approaches to studying knowledge management. Recently, knowledge management has been arousing an increasing interest. Knowledge management embodies organisational processes that seek synergistic combination of data and information-processing capacity of information technologies, and the creative and innovative capacity of human beings. [15]. We share the opinions of researchers adhering to a process-focused approach to knowledge management: knowledge management is a systemic management of all activities (processes) manifested in the obtaining and development, coding

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and storing, transfer and exchange, as well as use of knowledge for genera-ting competitive advantages in an organisation. The efficiency of knowledge management depends on how the obtaining and transfer of new knowledge is managed in an organisation [16; 17].

Therefore, one of the key objectives of knowledge management is its unification and availability, since different departments of one organisation often waste resources on accumulating similar information and duplicating actions as a result of poorly managed knowledge exchange and transfer processes [18].

It has been established that enterprises benefit from a well-organised and functioning process of knowledge transfer and exchange between depart-ments, which can be both formal and informal [19].

Other scholars believe that the only stable competitive advantage comes from the successful generation of new knowledge [20].

There are different means of knowledge generation in business — by analyst and expert groups within the enterprise's departments or as a ge-neralised practical result of implemented programmes and projects. At the personal and group management level, new knowledge is often a result of training, advanced training, and targeted acquisition of knowledge. Another source of new knowledge is the recruitment of staff with an already high le-vel of knowledge and skills gained in previous employment. Yet another source of knowledge is the acquisition of other enterprises with their specia-lists, knowledge, technology, and experience. However, building new know-ledge is not a systemic process that can be easily planned or controlled [21].

Storage and *processing* of knowledge at enterprises is necessary for the accumulation and development of knowledge assets: knowledge should be well organised and easily accessible for search and business purposes. The *transfer* (dissemination) of knowledge takes place in different ways. It can be disseminated through documentation, data and knowledge base expan-sion. Most of new knowledge is transferred orally: from a person to a person via communication, cooperation, workshops, etc. Of special importance is the creation of a favourable atmosphere for exchanging ideas and experien-ce. A significant element of knowledge dissemination is the demand for it shaped by the needs of the innovative development of the enterprise's busi-ness processes, and the employee's interests associated with professional growth and personal development. However, a significant amount of know-ledge is never used or is not used more than once. The *use* of knowledge is the final stage of the knowledge management process. Its use depends, first of all, on the abilities and motivation of the employees. One cannot rely solely on their professional interest or work ethics. The enterprise should encourage the use of new knowledge by different means: acknowledgement and rewards, promotion, etc.

Although the importance of knowledge has been recognised by business theorists and practitioners, the process of its transfer from one person to another is still an important problem for most enterprises and organisations [22—25]. Knowledge transfer is a complex process, since knowledge is found in the minds of the employees [26] and is often ill-structured, whereas

its transfer depends on the level of communication and trust among the employees [27]. A criterion of the efficiency of the changing knowledge massive as the enterprise's asset is the ability of the employee to obtain the necessary knowledge in time. Thus knowledge is relevant when it is encoded, classified, and presented in a format convenient for storage. In this case, knowledge can be used to the benefit of the employees at the opportune time and for certain purposes. The storage and encoding of knowledge is important not only for its effective use, but also in case there is a need to use it again. Therefore, it belongs to the enterprise rather than the employees [28].

Finally, the process of using of and benefitting from knowledge relates to the storage of knowledge obtained in the previous processes for further use and aimed at value added increase [29; 30]. One of the most complex functions of encoding is the systematisation and storage of knowledge without losing its content-related and other unique features that create its value [31]. The most difficult process is the encoding of implicit knowledge, since it is linked to the experience of the carrier of knowledge both subjectively and situationally [32]. Therefore, the processes related to knowledge (i. e. innovative ideas) transformation into goods and services with higher value added requires a more systemic and disciplined approach [33]. Knowledge management is less profitable if the generated knowledge cannot be applied for increasing the competitiveness and innovativeness of an enterprise. Therefore, knowledge management is a continuous processes aimed at the generation, storage, processing (accumulation), and use of knowledge at an enterprise to create competitive and innovative goods and services with higher value added.

Research methods. *The objective of the research* is defined as follows: assess the processes of managing formal and informal knowledge and its impact on the objective and subjective indicators of the competitiveness of a small or medium enterprise operating in the Latgale region. To achieve this objective, knowledge management is operationalized by the following processes: *F1 —* knowledge and strategy; *F2 —* knowledge acquisition; *F3 —* knowledge production; *F4 —* knowledge exchange; *F5 —* knowledge storage and documentation; *F6 —* use of knowledge; *F7 —* result of knowledge management. For assessing the processes of knowledge management, each process is juxtaposed with a set of statements that are evaluated by the respondents according to a Likert scale. The development of the integrated indicators of *F1, F2...., F7* processes is conducted with the help of an averaged value of the assessments of each process. To calculate the generalised assessment of knowledge management processes (a generalised integral coefficient of knowledge management) *F*, it is necessary to calculate the arithmetic average of process assessments *F1, F2...., F7*:

$$F = \frac{1}{7} \sum (F1 + F2 + F3 + F4 + F5 + F6 + F7),$$

where *F* is the final generalised indicator of knowledge management, and *F1, F2, etc.* are generalised indicators by knowledge management processes.

Therefore, knowledge management processes and, therefore, their gene-ralised indicator of knowledge management are scalar values.

The competitiveness of an enterprise is a general measure of interest and confidence in its goods and services in stock, financial, labour, and other markets. Key factors behind it are as follows: the enterprise value, workplace equipment, management concept, management technology, organisational system, human capital, strategic marketing, and technological, investment and innovative policies.

The operationalisation of the competitiveness rates of the enterprise can be divided into two groups. The first one brings together indicators that reflect objective characteristics of the enterprise's competitiveness: changes in income over the last three years, changes in cost effectiveness over the last three years, changes in sales over the last three years, changes in the market share over the last three years. The second group brings together in-dicators that reflect the subjective characteristics of the enterprise's com-petitiveness: a better performance than that of competitors, a greater market share, a higher growth rate of its earnings, a greater amount of innovations, a lower production cost than that of competitors.

A quota survey of managers and specialists at enterprises that meet the requirements of the study was chosen as a method of analysing knowledge management processes at the region's small and medium enterprises. The survey was conducted in June 2013 in the Latgale region of Latvia. The region comprises Balvi, Daugavpils, Krāslava, Ludza, Preiļi and Rēzekne Municipalities, and two cities of republican subordination — Daugavpils and Rēzekne. The region's area is 14.5 thousand square kilometres. Population density is 14 people per square kilometre; 292.6 thousand people live in Latgale.

A total of 104 regional enterprises showing the characteristics of small and medium businesses (in terms of turnover, number of employees, and cost of equity) participated in the survey conducted by the Institute of Social Studies at Daugavpils University. The survey was based on a stratified sample. The main stratification parameters included industry affiliation (manufacturing, trade, services, etc.) and geographical localisation (territory of the region). The survey parameters differ from the regional population parameters by less than 3 % in total in terms of relative indicators. The maximum sample error is less than 3 % at a 95 % confidence level. Top level managers accounted for 35 % of the respondents, mid-level managers (enterprise departments) for 19 %, lower level managers for 8 %, specialists for 35 %, and other employees for 3 %. An average respondent's period of employment at the enterprise was 3.1 years; an average enterprise's period of operating in the market was 3.5 years. Most enterprises (65 %) were limited liability companies; the rest of the respondents represented private entrepreneurs (30 %) and unlimited liability companies (5 %). In 73 % of the enterprises, the aggregate balance did not exceed 2 million euros, in 12 % — 10 million euros, in 15 % — 43 million euros. The equity base of small and medium enterprises of the Latgale region averaged 82 %. The surveyed enterprises had one personal computer per 3—4 employees.

Key results of studying knowledge management processes at the region's small and medium enterprises. As a result, the above values associated with knowledge management processes were assessed on a scale from 1 (a low value) to 5 (a high value) (Table 1).

Integral indicators by knowledge management processes at the small and medium enterprises of the Latvian Latgale region

Indicator	Value	Level
F1 — Knowledge and strategy	3.1	Average
F2 — Knowledge acquisition	3.3	«
F3 — Knowledge production	3.1	«
F4 — Knowledge exchange	3.0	«
F5 — Knowledge storage and documentation	3.2	«
F6 — Use of knowledge	3.6	Above average
F7 — Result of knowledge management	2.9	Average
F — Generalised integral coefficient of knowledge management processes	3.1	«

Source: calculations based on the survey results obtained in the framework of the SPSS project.

It was established that the most developed processes at Latgale's small and medium enterprises are the use of knowledge and knowledge acquisition, and the least developed — the results of knowledge management and knowledge exchange. The method of correlation analysis was used to interpret data for proving a hypothesis about the influence of knowledge management processes on an enterprise's competitiveness. A positive linear correlation between the objective competitiveness rates and the generalised integral coefficient of knowledge management was established for the surveyed enterprises. The greatest impact of knowledge management was exerted on the respondents by the indicators "changes in income over the last three years" (ρ(Spearman) = 0.480, p-value = 0.00) and "market share over the last three years" (ρ(Spearman) = 0.470, p-value = 0.00). Of less significance are the indicators reflecting the changes in cost effectiveness over the last three years (ρ(Spearman) = 0.354, p-value = 0.00) and the changes in sales over the last three years (ρ(Spearman) = 0.337, p-value = 0.00) (Table 2).

A stronger positive linear correlation was established between the subjective competitiveness rates and the generalised indicators of knowledge management.

Table 2

Results of a correlation analysis of objective and subjective competitiveness rates and the generalised integral coefficient of knowledge management

Objective (direct) competitiveness factors	F (generalised integral coefficient of knowledge management) Spearman's rank correlation coefficient	Subjective (indirect) competitiveness factors	F (generalised integral coefficient of knowledge management) Spearman's rank correlation coefficient
Changes in income over the last 3 years	0.480 (significance value 0.00)	A better performance than that of competitors	0.378 (significance value 0.00)
Changes in cost effectiveness over the last 3 years	0.380 (significance value 0.00)	A greater market share than that of competitors	0.476 (significance value 0.00)
Changes in sales over the last 3 years	0.337 (significance value 0.00)	A higher earnings growth rate than that of competitors	0.592 (significance value 0.00)
Changes in exports over the last 3 years	0.354 (significance value 0.00)	A greater amount of innovations than that of competitors	0.565 (significance value 0.00)
Changes in the market share over the last 3 years	0.470 (significance value 0.00)	A lower production cost than that of competitors	0

Source: calculations based on the survey results obtained in the framework of the SPSS project.

The most significant impact of knowledge management on the respondents was associated with indirect competitiveness rates: "earnings growth rates in comparison to other enterprises" (ρ(Spearman) = 0.592, p-value = 0.00) and the "degree of innovativeness in comparison to competitors (ρ(Spearman) = 0.565, p-value = 0.00). Of less significance are other competitiveness rates: "market share in comparison to competitors" (ρ(Spearman) = 0.476, p-value = 0.00) and "an assessment of performance in comparison to competitors" (ρ(Spearman) = 0.378, p-value = 0.00). However, no linear correlation was established between the integral knowledge coefficient and such indirect competitiveness rates as an assessment of production costs in comparison to competitors (Table 2).

Through using the correlation analysis method for assessing competitiveness rates and integral coefficients associated with knowledge management processes, it was established that there is a close connection between the rates of development of small and medium enterprises and the process of managing knowledge for increasing competitiveness and innovativeness of enterprises.

Firstly, income growth over the last three years correlates with the factors F1 (knowledge and strategy, r = 0.586, p-value = 0.000), F3 (knowledge production, ρ(Spearman) = 0.639, p-value = 0.000), F5 (knowledge storage and documentation, ρ(Spearman) = 0.444, p-value = 0.000), F6 (use of knowledge, ρ(Spearman) = 0.307, p-value = 0.000), F7 (result of knowledge management, ρ(Spearman) = 0.629, p-value = 0.000).

Secondly, an increase in cost effectiveness over the last three years correlates with the factors F1 (ρ(Spearman) = 0.354, p-value = 0.000), F3 (ρ(Spearman) = 0.572, p-value = 0.000), F5 (ρ(Spearman) = 0.229, p-value = 0.020), F7 (ρ(Spearman) = 0.551, p-value = 0.000).

Thirdly, an increase in output over the last three years correlates with the factors F1 (ρ(Spearman) = 0.392, p-value = 0.000), F3 (ρ(Spearman) = 0.536, p-value = 0.000), F4 — "knowledge exchange" (ρ(Spearman) = 0.214, p-value = 0.030), F5 (ρ(Spearman) = 0.252, p-value = 0.010), F6 (ρ(Spearman) = 0.335, p-value = 0.000), F7 (ρ(Spearman) = 0.465, p-value = 0.000).

Fourthly, an increase in the exports of goods and services over the last three years correlates with the factors F1 (ρ(Spearman) = 0.354, p-value = 0.000), F3 (ρ(Spearman) = 0.442, p-value = 0.000), F5 (ρ(Spearman) = 0.298, p-value = 0.010), F6 (ρ(Spearman) = 0.300, p-value = 0.000), F7 (ρ(Spearman) = 0.508, p-value = 0.000).

Fifthly, an increase in the market share of the last three years correlates with the factors F1 (ρ(Spearman) = 0.527, p-value = 0.000), F2 — "knowledge acquisition" (ρ(Spearman) = 0.195, p-value = 0.049), F3 (ρ(Spearman) = 0.601, p-value = 0.000), F4 (ρ(Spearman) = 0.283, p-value = 0.004), F5 (ρ(Spearman) = 0.310, p-value = 0.001), F6 (ρ(Spearman) = 0.296, p-value = 0.003), F7 (ρ(Spearman) = 0.536, p-value = 0.000).

Results of the study. The results of the study into knowledge management at the region's small and medium enterprises are in line with the findings of other influential studies into the impact of knowledge management on an enterprise's efficiency. Many researchers stress the importance of the processes of building, storing and processing, transferring and using knowledge at the enterprise and consider them as a competitive advantage [34—37].

Others [38] have established that the only stable competitive advantage is building new knowledge. However, we believe that other factors will be underestimated in this case. The process of using of and benefitting from knowledge depends to the organisation of the storage of knowledge obtained in the previous processes for further use and aimed at value added increase [39; 40], which has been proved in the study. It has identified the impact of the above processes on the enterprise's competitiveness and innovativeness in the case of small and medium enterprises of Latvia's Latgale region in 2013. It has been established that the building of knowledge and the knowledge of strategy affected the income increase observed over the last three years. The process of building new knowledge had the most profound effect on the increase in cost effectiveness. Building new knowledge, familiarity with the strategy, and the result of knowledge management affected the increase in the market share over the last three years.

Conclusions

1. Our assessment of the processes of knowledge management at small and medium enterprises in the Latgale region has shown that the employee's knowledge and experience are at a medium level (on a 5-point scale) ranging from 2.9 to 3.6 points. This fact is indicative of that the possibilities of knowledge management processes are not used to their full potential at small and medium enterprises in Latgale. Therefore, there are hidden reserves for increasing the competiveness of these enterprises. As the study shows, regional enterprises have to improve their understanding of new knowledge as a key value for developing the competitive and innovative potential of businesses.

2. The worst results were shown by processes resulting in knowledge management (2.9 points) and knowledge exchange (3.0 points). The processes of using (3.6) and obtaining (3.3) knowledge are better developed.

3. It has been proved that one of the crucial factors affecting the competitiveness and innovativeness of enterprises is knowledge management. We have established a positive linear correlation between the generalised integral coefficient of knowledge management and the objective/subjective competitiveness rates (changes in incomes over the last three years, changes in cost effectiveness over the last three years, changes in sales over the three years, changes in exports over the last three years, changes in the market share in the last three years, a better performance than that of competitors, a greater market share than that of competitors, a higher earnings growth rate than that of competitors, a greater amount of innovations in comparison to competitors).

4. There is a prevalence of a more significant positive linear correlation between subjective competitiveness rates and the generalised integral coefficient of knowledge management than that between objective competitiveness rate and the generalised integral coefficient. This shows that the management and employees of the enterprises overestimate the competitiveness of their companies in comparison to similar businesses. However, it is rather a positive fact, since it is indicative of the positive attitude of the employees to their company.

5. The study has shown that the process of building new knowledge has the most profound effect on the competitiveness rates, followed by those of familiarity with the strategy and the general results of knowledge management.

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