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INVESTIGATION OF THE KNOWLEDGE COMBINATION INTERRELATIONS BETWEEN SMEs AND CONSUMER/SUPPLIER NETWORK

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Abstract

It is very important to understand and apply the full implications of knowledge management implementation and improve the interrelations between SMEs and consumer/supplier network in order to grow network knowledge, knowledge combination and knowledge creation. The purpose of this work was to explore the impact of network knowledge and knowledge combination to knowledge creation in the example of Serbian entrepreneurial firms. The investigations were done using a questionnaire, based on which three hypotheses were developed and tested by a structural equation model, using linear structural relations (LISREL statistical package software).

Keywords: entrepreneurship, knowledge, SMEs

1. INTRODUCTION

The main task of knowledge management is to make strong relationship with technology, and give the answers to how technology can be used to leverage business success (Madhavan & Grover, 1998; Dyer & Nobeoka, 2000; Blomstermo et al., 2004; Gottschalk, 2005). As we gradually move into the ICT world, the products and services of most organisations have become extremely complex with significant non-material component. The work of organisations is increasingly based on knowledge - their processes are based on knowledge and they compete on the knowledge base. In fact, their very survival is based on knowledge - on their realising how important knowledge is to them, and in making use of knowledge. It can be argued that the organisations that can harness the power of knowledge will be the eventual winners, while the rest will remain laggards, or even disappear (Gottschalk, 2005).

Different organisations may be at different stages of advancement in their

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pursuit of knowledge management, but the resource based strategy for knowledge management is a strategic business resource just as money and material are (Madhavan & Grover, 1998; Dyer & Nobeoka, 2000; Gottschalk, 2005). Successful knowledge management means successful knowledge transfer, which involves transmission, absorption and use of knowledge (Madhavan & Grover, 1998).

Although knowledge networks, and knowledge transfer as their main characteristic, are widely known to stimulate innovative behavior in entrepreneurial firms, little is known about the actual factors that underlie knowledge creation in these settings. Small and medium-sized enterprises (SMEs) grow and develop, as other bigger organizations, when dispersed bits of knowledge is arecombined in the frame of producer/customer/supplier network. New knowledge that no one had previously anticipated may be created then (Bergeron, 2003; Dew et al., 2004; Stamatović and Zakić, 2010), which is of great importance and significance for the SME innovative performances expanding. An entrepreneurship perspective implies that combinations of dispersed bits of knowledge, that are superior to other firms, may lead to the establishment of temporary competitive advantages (Kirzner, 1973; Thorpe et al., 2005). So, the process of knowledge combination is entrepreneurial by nature as it involves a sudden act on intuition

Therefore, investigation of the knowledge combination interrelations between SMEs and consumer/supplier network is very important to understand and apply the full implications of knowledge management implementation (Thorpe et al., 2005; Tolstoy, 2009). This work presents the results of research conducted among Serbian entrepreneurial firms in order to explore the impact of network knowledge and knowledge combination to knowledge creation in investigated SMEs.

2. METHODOLOGY

2.1. Hypothesis development and structural model defining

Entrepreneurial firms compete on their ability to create new knowledge that facilitates the improvement of product offerings as well as responsiveness to market conditions. Dynamic knowledge-based view presents a slow process by which SMEs expansion is driven by the accumulation of market knowledge (a function of the knowledge SMEs have acquired in the market) (Kirzner, 1973; Borgeron, 2003; Dew et al., 2004; Thorpe et al., 2005; Tolstoy, 2009; Tagraf and Akin, 2009).

The knowledge combinations, which results from such knowledge transfer at the market, put firms in line with the dynamics of market preferences and technological structures (Kirzner, 1973; Thorpe et al., 2005) and enhance the knowledge creation of SMEs.

According to above mentioned statement and work of Tolstoy (2009), the hypotheses were developed in the following way:

H1: Knowledge combination has a positive effect on an entrepreneurial firm's knowledge creation;

H2: Dependence on customer network knowledge has a positive effect on an entrepreneurial firm's knowledge combination; and

H3: Dependence on supplier network knowledge has a positive effect on an entrepreneurial firm's knowledge combination, and consolidated in Figure 1

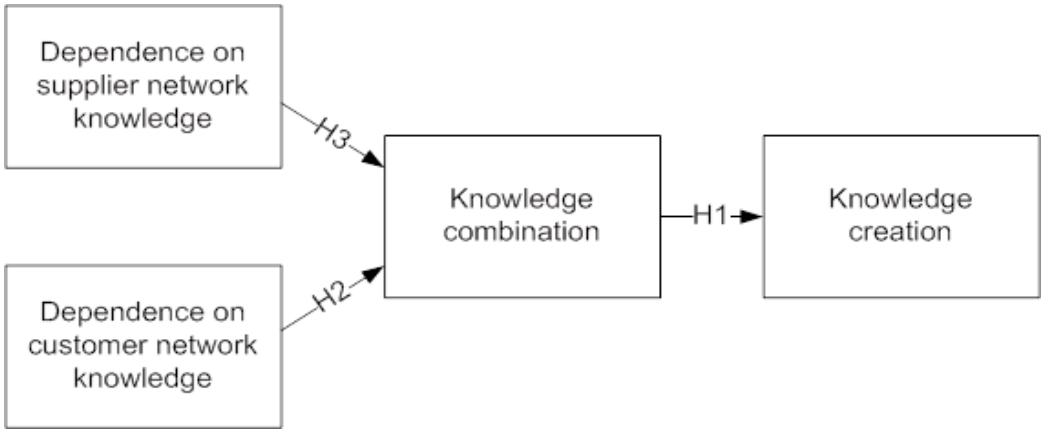

Figure 1. The hypothetic model

into a hypothetic model including four conceptually built constructs and relationships between them.

2.2. Investigation method and data collection

The questionnaire was used as the investigation method for data collection in this work. It was prepared in two parts – first part included general characteristics of the investigated SMEs, while the second part was constructed based on three developed hypotheses. The questionnaire structure is given below:

Part I – General characteristics

1. Entrepreneurs profile:
   1) Male
   2) Female
2. The size of the entrepreneurial venture - the number of currently employed workers:
   l) up to 10
   2) 10-30
   3) 30-50
   4) 50-250
   5) over 250
3. Time since the founding of SME:
   1) up to 1 year
   2) 1-3 yr.
   3) 3-5 yr.
   4) 5-10 yr.
   5) over 10 years
4. The area of SMEs businesses:
   1) Agriculture
   2) Transport
   3) Industrial production
   4) Tourism
   5) Services
   6) Health

Part II – Testing the influence of knowledge exchange between SMEs and the consumers & suppliers network (Tolstoy, 2009)

1. Your relationship with business partners depends on information, knowledge and experience gained from your major suppliers.
2. Your relationship with business partners depends on the regulations, knowledge and experience obtained from other suppliers in the market.
3. Your relationship with business partners depends on information, knowledge and experiences obtained from your main

customers / service users.

4. Your relationship with business partners depends on information, knowledge and experience gained from other consumers on the market.

5. Business partners are the source of information, knowledge and experience for you.

6. The relationship with business partners is characterized by mutual adjustment.

7. The relationship with business partners is characterized by the exchange of information, knowledge and experience.

8. You are acquainted with information, knowledge and experiences your business partners have.

9. The relationship with your business partners results in the creation of new products / new services.

10. The relationship with your business partners results in the development of new procedures, practices, organizational details etc., in your company.

Likert type of five level scale with answers: 1 – absolutely disagree; 2 - do not agree; 3 – neutral; 4 - agree and 5 – absolutely agree, was used for the investigations.

The results, obtained by terrain investigations, were tested by a structural equation model, using linear structural relations - LISREL 8.30 statistical package software.

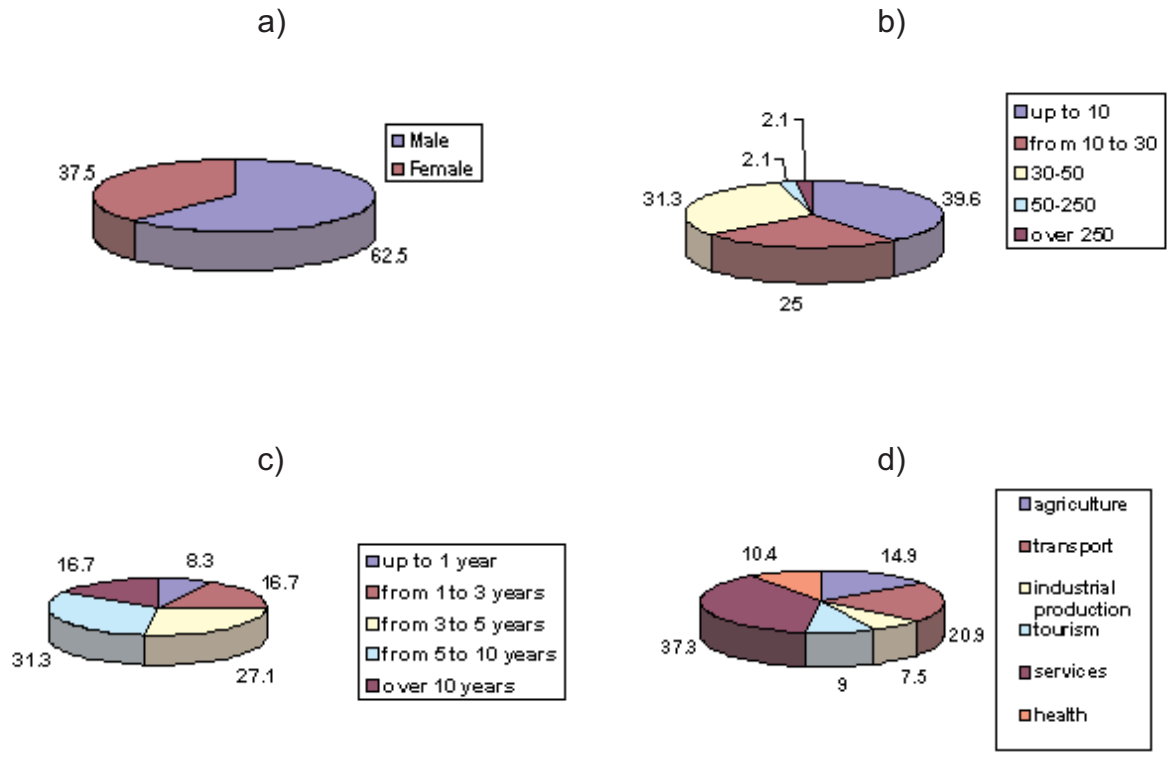

Figure 2. Data obtained for the investigated SMEs general characteristics: a) entrepreneurs profile; b) the number of currently employed workers; c) time since the founding of SME; and d) the area of SMEs businesses - all results are shown in %

3. RESULTS AND DISCUSSION

3.1. Questionnaire investigation

For the investigations, which results are presented in this paper, the questionnaire was applied on 94 Serbian SMEs and done directly by asking the etrepreneurs the questions from the list. Total number of valid questionnaire lists which were taken into account for the statistical analysis was 94.

The answers, obtained for the first part of the questionnaire – general characteristics, were statistically interpreted and shown in Figure 2.

The answers, obtained for the second part of the questionnaire – testing the influence of knowledge exchange between SMEs and the consumers & suppliers network, were firstly analyzed and shown in Figure 3.

3.2. LISREL analysis

LISREL analysis is used as a statistical technique to study direct and indirect relationships between one or more independent variables and one or more dependent variables. This technique was applied to data obtained as the results of terrain investigations for the second part of presented questionnaire (Figure 3). Statistical analysis and testing of the influence of knowledge exchange between SMEs and the consumers & suppliers network was done using structural equation model according to proposed hypothetic model (Figure 1), by LISREL 8.30 statistical package software.

The results of statistical analysis are presented in Table 1 and Table 2. The constructs and their indicators, including path coefficients, t-values and R2-values are given in Table 1, while main results of the structural model are presented in Table 2.

Table 1. The constructs and their indicators

Indicator (number of question in questionnaire)	Path coefficients	t-Value	R^2-Value
Dependence on supplier network knowledge			
1	0.47	3.13	0.78
2	0.99	6.19	0.20
Dependence on customer network knowledge			
3	0.79	5.56	0.38
4	0.73	5.14	0.47
Knowledge combination			
5	0.64	N.A.*	0.59
6	0.83	4.80	0.32
7	0.82	4.76	0.33
8	0.50	3.18	0.75
Knowledge creation			
9	0.84	N.A.*	0.30
10	0.91	8.12	0.17

* N.A. - not applicable

The validity of LISREL models is measured with regard to both the validity of the entire model (nomological validity) and the specific relationships within the model (Tolstoy, 2009). Because the model is constituted by various constructs, its validity may be estimated by measuring the degree of separation between constructs (discriminant validity), as well as the degree of homogeneity of these constructs (convergent validity) (Tolstoy, 2009). Convergent validity is con-firmed if the indicators load only on the constructs to which they belong. Evaluation of convergent validity is carried out by analysis of t-values (significance), R2-values (linearity), and factor loadings (correlation). As recommended by Hair et al. (1995), convergent validity is supported by checking for construct reliability and variance extracted. The constructs (presented in Table 1) show acceptable convergent validity, as all R2-values are above 0.20 and all t-values are above 3.13, which is in

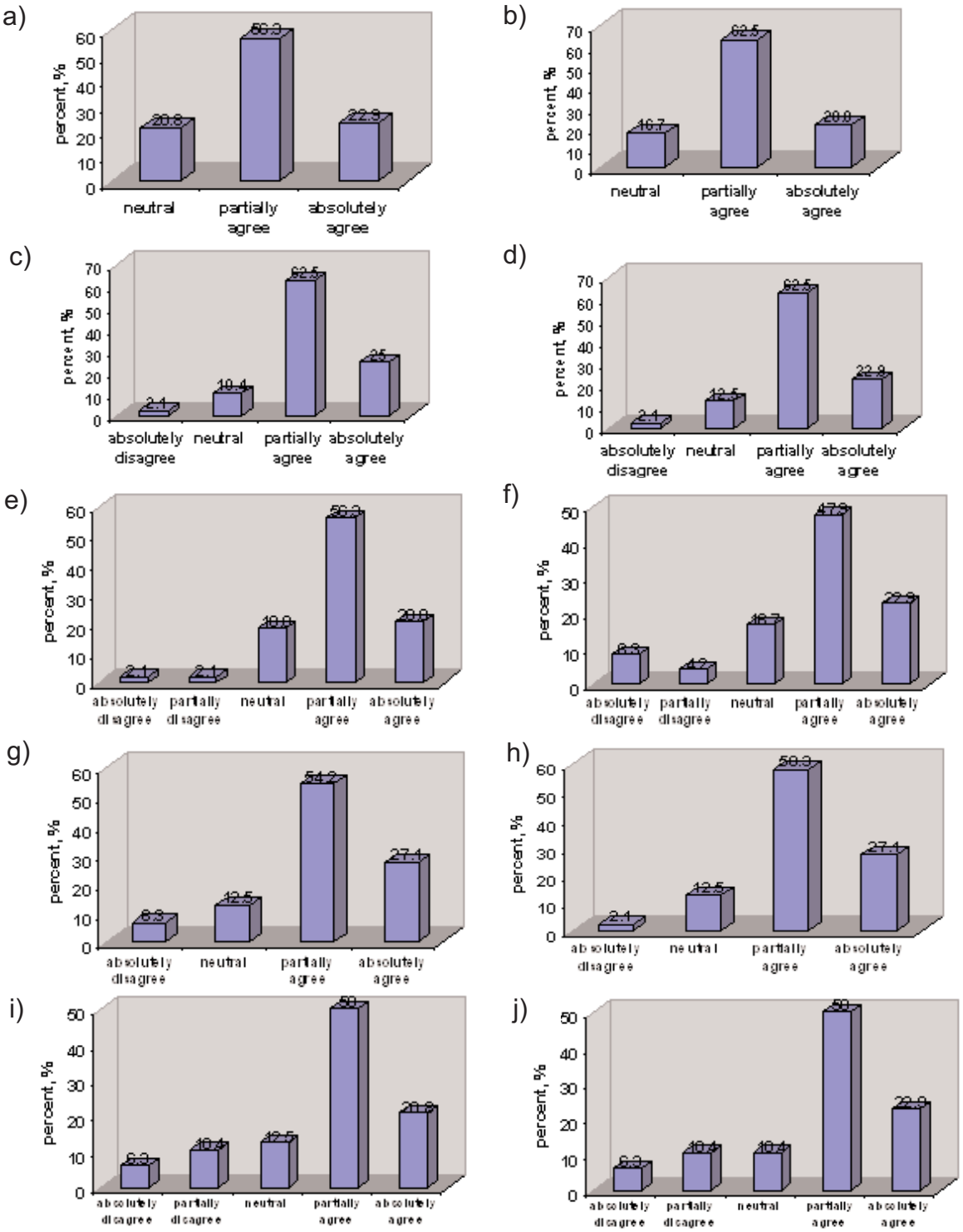

Figure 3. Data obtained for the investigated SMEs – answers to the questions in the second part of questionnaire (a) question 1; b) question 2; c) question 3; d) question 4; e) question 5; f) question 6; g) question 7; h) question 8; i) question 9; and j) question 10)

Table 2. The results of the structural model

Paths	Path Coefficients	t-Value
Knowledge combination → Knowledge creation	1.02*	4.79*
Dependence on customer network knowledge → Knowledge combination	-0.16	-0.39
Dependence on supplier network knowledge → Knowledge combination	0.69*	2.62*

$\chi 2 = 59.47$
df = 31
GFI (goodness of fit index) = 0.96
RMSEA (root mean square error of approximation) = 0.081
CFI (comparative fit index) = 0.92
* - denotes significance at 0.05 level (5% level)

accordance with recommended significance at 0.05 level (5%) (Hair et al., 1995). A further check for multicollinearity among constructs was conducted through a confirmatory factor analysis, shown in Table 2, where all constructs were tested in a measurement model. The test should ensure validity of the proposed model and in this case it indicates that the constructs are valid as the fit between the constructs, and the model is good ($\chi 2 = 59.47$; degrees of freedom, df = 31; comparative fit index, CFI = 0.92; goodness of fit index, GFI = 0.96), so one may conclude that the measurement model is statistically significant. As displayed in Table 2, the model seems to be statistically valid as it meets all of these requirements.

Considering the hypotheses presented in the proposed hypothetic model, hypotheses H1 and H3 were confirmed, while hypothesis H2 failed. So, we confirmed in this work that, *knowledge combination has a positive effect on an entrepreneurial firm's knowledge creation as well as that dependence on supplier network knowledge has a positive effect on an entrepreneurial firm's knowledge combination*,which is in agreement with the results of investigation of Tolstoy (2009). The validity of hypothesis H2 in the case of the investigation he did on certain Swedish SMEs last year was also confrimed (Tolstoy, 2009), while we did not confirm that hypothesis. In the case of investigated Serbian SMEs, *dependence on customer network knowledge does not have a positive effect on an entrepreneurial firm's knowledge combination*, which means that producers relying on the knowledge of consumers does not contribute to the knowledge creation in the firm. That fact may be partially explained by the influence of weak, inappropriate or not well developed marketing function in the investigated SMEs, indicating to a low level of respecting the wishes and demands of consumers as a negative trend in Serbian SMEs. Therefore, the total knowledge of the firm is deprived of essential information, influencing significant distance from contemporary trends, where the importance of marketing function in the company is extremely important.

5. CONCLUSIONS

The impact of network knowledge and knowledge combination to knowledge creation in the example of Serbian entrepreneurial firms has been discussed in

this paper. The research was based on the proposed hypothetic model and done by questionnaire terrain investigations. Further, three given hypotheses were tested by a structural equation model, using LISREL 8.30 statistical package software. Applied test ensured validity of the proposed model and it was confirmed that knowledge combination had a positive effect on an entrepreneurial firm's knowledge creation, as well as that dependence on supplier network knowledge had a positive effect on an entrepreneurial firm's knowledge combination, while dependence on customer network knowledge did not have a positive effect on an entrepreneurial firm's knowledge combination. Last hypothesis indicates to existing of eventual problems in marketing functioning in investigated SMEs.

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ИСТРАЖИВАЊЕ ИНТЕРРЕЛАЦИЈЕ КОМБИНАЦИЈЕ ЗНАЊА ИЗМЕЂУ МСПа И МРЕЖЕ КУПАЦ/СНАБДЕВАЧ

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Извод

Веома је значајно разумети и применити све могућности управљања знањем као и побољшати међурелације између МСПа и мреже корисник/купац, како би се увећала мрежа знања, комбинација знања и стварање знања. Циљ овог рада је да истражи утицај мреже знања и комбиновања знања на стварање знања на примеру предузетничких фирми у Србији. Истраживања су спроведена употребом упитника, засновано на ком су развијене три хипотезе. Хипотезе су потом тестиране употребом модела структурних једначина, преко линеарних структурних односа (ЛИСРЕЛ статистички софтверски пакет).

Кључне речи: предузетништво, значе, МСП