

CREATIVITY AND INNOVATION IN LARGE ENTERPRISES - CASE OF SLOVENIAN ENTERPRISES

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Abstract

The focus of the endeavours of enterprises and other organisations has shifted from the production and sales of standardised products and services to tailor-made products according to individual customers' requirements. Flexibility, creativity and innovation have become of utmost importance. Although many authors have argued that large enterprises are unable to adapt to the required changes, such predictions have not been realised. On the contrary, large corporations have adapted to the changes, mainly by changing and developing their organisation. Thus, changes in organisational structure, organisational culture and organisational processes have led to creativity and innovation in large enterprises. In the first part of the article, we attempt to show these adaptations briefly and systematically. In the second part, we review research on this issue and its results in large Slovenian enterprises, in order to prove the hypothesis that large Slovenian enterprises have also changed their organisation to adequately develop their creativity and innovation. We also attempt to prove that creativity and innovation have resulted in improvements of efficiency and effectiveness.

Keywords: *creativity, innovation, organisation, organisational structure, organisational culture, organisational processes, efficiency, effectiveness*

1. INTRODUCTION

At the beginning of the 20th century and earlier, there was a lack of products and services, and they were quite expensive. Due to the technical division of labour and the standardisation of products, enterprises became able to increase quantities of products and decrease their costs. Products were generally standardised, and customers had to adapt to them. Costs decreases followed the experience or learning curves. The increase in efficiency was mainly due to technical efforts. Enterprises competed on the basis of cost/low price. Production was simultaneously a bottleneck and the most promi-

nent business function, as it was not a problem to sell products. Production has been developed, quantities increased, costs and selling prices were decreasing, while efficiency was increasing. Organisations became increasingly larger.

Therefore, it became easier for customers to obtain desired products and services at affordable prices. It became more difficult to find customers and to sell the quantities produced. Becoming aware of this, customers started to increase their requirements regarding quality, delivery times, etc. Production had to adapt to requirements of customers and deliver them more tailor-made, unique products and services. Sales (not production) be-

came the bottleneck. The adaptation to different customers required flexibility, creativity and innovativeness. This changed business tremendously. Customers displaced products as the focus of enterprises. Just-in-time production (JIT) instead of classic production, team work instead of hierarchical departments, research and development of new products and processes instead of constant improvements leading to efficiency, etc. are just some of the results of this change of focus.

Instead of producing a vast quantity of standard products for all customers, enterprises have to produce tailor-made products for individual customers and still remain efficient. They have to develop new products and services and be able to produce them efficiently at the same time. How to cope with such a requirement remains a key issue. It seems that the quantity of products and the size of enterprises no longer matter. Enterprises have grown to become efficient but not flexible, creative and innovative. Most large corporations have envisaged a crisis at the beginning of the second half of the past century. It is not surprising that many authors wrongly thought that large enterprises were not able to develop creativity and innovation; they are condemned to become extinct like dinosaurs in a new environment.

To the surprise of many, large enterprises again gained momentum and success, and have proven themselves to be not only efficient but also flexible, creative and innovative. What have they done to remain the pillars of each national economy and the bearers of development?

In this article, which is based on doctoral research (Stjepanović Vračar, 2012) conducted by the doctoral student Aleksandra Stjepanović Vračar under the mentorship of Prof. Rozman at Faculty of Economics, University of Ljubljana, we will prove that large enterprises have changed and adapted to new situations. We will show the different ways they have supported and achieved creativity and innovation; these ways will be connected to organisation structures, processes and culture. By changing and developing their organisation, enterprises have been able to develop new products, services and processes and to remain competitive and successful.

In order to show how large enterprises cope with new challenges and how they maintain their

creativity and innovativeness, we will discuss organisational changes and measures to support creativity and innovation in a systematic way. The emphasis of organisational solutions differs between enterprises; nevertheless, common features are quite strong.

First, we briefly discuss the creativity and innovation process and the supporting organisational solutions. We will develop a model of organisational phenomena as independent variables influencing creativity and innovation, and the two influencing efficiency and effectiveness of enterprises. We have conducted empirical research in large Slovenian enterprises, and we will review and explain the results obtained.

2. PROCESS OF CREATIVITY AND INNOVATION

Creativity is the generation of new ideas that meet perceived needs or respond to opportunities for the organisation (Daft & Noe, 2001: 116); it is the production of novel and useful ideas by an individual or team within organisation (Hellriegel et al., 1998: 458). Creativity affects products and services and processes in all areas of human activities (Amabile, 1997: 40). It is a decision-making process resulting in new useful ideas. Accordingly, organisational innovation is the implementation of creative and useful ideas through unplanned and planned organisational change (Muller, 1995: 16-19).

Authors define **the creativity process** in a similar way. For Schermerhorn and his co-authors, (2000: 362) the process consists of:

- cognition of a problem or an opportunity;
- gathering the additional information on the problem and opportunity;
- searching for ideas to resolve the problem or utilise the opportunity;
- selection of the suitable ideas and their verification;
- selection of the best idea.

Innovation is widely recognised as one of the critical problems facing business today. The **process of innovation** starts with the best idea produced by

the creation process. It continues with the design of a product or service and process (Rozman, 2002: 124). A thorough feasibility analysis follows to determine whether the solution is feasible (Does the company have employees, material and other resources? Is a market available, etc.?). The last step is the verification of success (Will the innovation be profitable?). Following that, the implementation and control start.

Similarly, Tidd, Bessant and Pavitt (2001: 52) determine the process as:

- gathering information on internal and external environments;
- proposing and comparing different solutions;
- selection of best solution, feasibility study and verification of success;
- preparation for production and other activities;
- production.

3. CREATIVITY AND INNOVATION MANAGEMENT MODEL

3.1 Understanding the organisation

New ideas are created by individuals who possess some distinctive traits like open-mindedness, originality, playfulness, curiosity, persistence and commitment (Vessels, 1982: 196). Many studies have found that creative people have similar personality traits: independence, openness to experience, lack of interest in social norms and social acceptance, high value on the activity and not money. They are intrinsically motivated. They are not conforming to demands of others, and they do not adopt the majority opinion. They are a dissenting voice. They pursue their ideas despite advice to do the contrary. They know what problem to focus on (Csikzentmihalyi, 1990: 193). Innovative people possess some different characteristics. Especially for creative people, it can be said that their creativity is partly inherited. However, their creativity can be stimulated and fostered by removing and overcoming blocks to their creativity.

Within organisations, creativity and innovativeness depend on individuals, but they also depend heavily on the organisation, on their relationships to others, especially managers. It depends on organ-

isational culture, structures and processes. The question arises of upon what structures, processes and culture creativity and innovation depend.

In order to examine the influences of organisation on creativity and innovation within formal social units in a systematic way, what is understood by the term 'organisation' has to be determined, as different understandings of this crucial phenomenon exist. We understand 'organisation as a set of relationships between people, who by relationships become members of a formed and which assures the existence, development and specific characteristics of the social unit and rational achievement of the social unit's goals' (Lipovec, 1987: 35). The first part of this definition looks at the organisation in a static way, as uniform structures of duties, responsibility, authority and communication that are adapted in a process of coordination. The coordination is conducted within each uniform structure and between them considering each role or position within the organisation, and taking contingency variables and dynamics into consideration. The second part of the definition examines organisation in a dynamic way, as all structures develop to processes in informal or formal ways. In a formal way, relationships or structures are changes by the governance-management process of planning, actuation and control. A more detailed and systematic description of organisation can be found in Rozman (2012: 2-25). Thus, within the organisation, we distinguish organisational structures and organisational processes; organisational culture can be considered separately as an informal process.

When we describe the influence of organisation on creativity and innovation, we distinguish the influences of organisational structures, organisational processes and organisational culture. In this article, we will discuss only some organisational changes that are tightly connected to creativity and innovation and which have been introduced in order to impact the development of creativity and innovation.

3.2 Organisational structures

Different organisation structures differently influence creativity and innovation. On the basis of their characteristics and the opinions of other authors, we believe that the following structural phenomena, in particular, are tightly connected to

creativity and innovation: team organisational structures, research and development departments, intrapreneurship, organisational learning, and knowledge management.

3.2.1 Team organisational structures

The organisational structures supporting efficiency have been functional organisational structure and to some extent also divisional and matrix structures. Ambidextrous, matrix and team structures have been developed, supporting the adaptation, creativity and innovation. The move from vertical to horizontal structures is parallel to the change from product to customer orientation. Hierarchical structures support learning by experience. Innovation cannot be learned directly by experience, but by (abstract) learning process. Hierarchical organisational structures are aimed at increasing efficiency. They are not suitable for influencing creativity and innovation. As creativity and innovation became a necessity, enterprises developed teams in order to create and innovate. Members of teams are supposed to be different from efficiency-oriented employees in hierarchical organisations.

Teams can represent part of the project-matrix structure; they can be also seen as informal teams in ambidextrous organisations. It is possible to form teams within hierarchical structures, such as quality circles. Such part-time, temporary teams and teams as part of ambidextrous organisation structures are formed to make and develop creative and innovative solutions. However, teams can become permanent and can be seen as prevailing in team organisational structures (Rozman, 2011: 138-139).

Empirical research supports the influence of teams and team structure on creativity and innovation. Some of the authors reflecting this include Harper and Becker (2004: 15-22), Egan (2005: 207-225), and Kratzer et al. (2006: 96).

3.2.2 Research and development departments

Research and development departments are quite common within large enterprises. They are mainly focused on the production problems of developing new products and new processes. Tidd and

Bessant (2009) claim that these departments have to cooperate with others, e.g. marketing and production; however, research and development also has to be conducted within other functions like marketing, management, etc.

An extensive study conducted by O'Connor and Ayers (2005: 22-34) has shown four ways of including R&D departments within the organisation. Firstly, the R&D departments are part of broader groups; they interact especially with the departments focusing on changes within the enterprise environment. Secondly, research and development activities are organised within the main R&D department at the headquarters and R&D departments within organisational units. The most significant innovations are handled within the central department. Thirdly, the R&D department within the enterprise is connected to the other departments that define problems to be solved and take part in the research and development. Fourthly, R&D departments submit proposals to organisational units, which will introduce and use the proposed changes.

Many authors talk about the outcomes of R&D departments. Steel and Murray (2004: 316-322) claim that enterprises with successful R&D departments have higher market growth and higher market value (shares).

3.2.3 Intrapreneurship

Entrepreneurship is defined as a process or activity in which the entrepreneur makes an investment by risking his own money and name. Creativity and innovation and taking risk are also at the core of intrapreneurship. As already mentioned, large corporations have to make different changes to remain entrepreneurial. One of them is **internal entrepreneurship or intrapreneurship**, which is similar to the entrepreneurship at the level of enterprises. Drucker (1992: 177-191) looks at intrapreneurship as spreading the entrepreneurial spirit within the enterprise thus making the ground for creativity and innovation.

Via intrapreneurship, motivation and support are given to creative and innovative employees to develop ideas and to turn them into products and services. The existence of intrapreneurship shows

the inclination of the corporation toward innovation (Rutherford & Holt, 2007: 429-446). Some authors emphasise the importance of organisational culture and structures (e.g. Hornsby et al., 2002: 253-273) as well as management (e. g. DeYong & Hartog, 2007: 41-64) for the development of intrapreneurial units. At this point, the discussed organisational phenomena and their influences on creativity and innovation are obviously correlated and intertwined.

Authors who have confirmed the influence of intrapreneurship on creativity and innovation include Zahra and Covin (1995: 43-58), Chang (2000: 99-104) and Dev (2009: 2-3).

3.2.4 Organisational learning

The learning of an individual can be defined as a relatively permanent change in knowledge and behaviour that results from practice and experience. The social constructionist perspective argues that the creation and application of knowledge happens within individuals but through social interaction and that the link between individual and organisational learning is crucial. Individual learning becomes embedded in an organisation's memory and structure (Kim, 2004: 29). The main question is the following: if social units learn through individuals, what makes the individuals directed so that they learn in a coordinated way to achieve organisational goals? Various authors have found the answers in the concepts of shared mental models, shared knowledge structure and common knowledge. Rozman and Sitar (2007) talk about learning by connectivity. The employees are connected by dynamic relationships, i.e. organisational structures and processes. The organisational knowledge thus depends on their members and on their organisation, e.g. mechanistic organisation will promote learning towards efficiency, whereas organic organisation will promote learning towards creativity and innovation.

Many authors in organisational learning have proved that especially nowadays creativity and innovation depend on appropriate organisation structures, processes and culture (Fong (2003: 479-486); Lin (2007: 315-332); Ling & Nasurdin (2010: 105-115); Westerlund & Rajala, (2010: 435-442)).

3.2.5 Knowledge management

According to its characteristics, knowledge management is part of organisational processes and less so of organisational structures. We included it within organisational structures due to its connection to organisational learning. However, the distinction between knowledge processing or organisational learning and knowledge management is crucial (McElroy, 2003: 10) in order to understand knowledge management.

Knowledge management is a management activity that seeks to enhance (or assure) the rationality of knowledge processing (McElroy, 2003: 54). According to Rozman and Sitar (2007), knowledge management assures the rationality in organisational learning, which consists of planning organisational learning and knowledge, planning individual learning within organisation, actuating individual learning by managing human resources and leading employees, control of individual learning and control of organisational learning.

Authors showing the connection between knowledge management and creativity and innovation include Deyong et al. (2007: 5860-5863), Chang and Lee (2008: 3-20), Heffner (2006), as well as Maqsood and Finnegan (2009).

3.3 Organisational processes

The influence of the governance-management process, which consists of business planning, planning organisation, actuating the organisation (consisting of HRM and leadership), control of organisation and business control (Rozman & Kovač, 2012) on creativity and innovation has been studied. We examined three issues: managers' influence by the process of management on employees, the managerial style, and the creativity and innovation of managers themselves.

3.3.1 Governance-management process

The functions of managers in our research have been proposed differently than usually. The usual mentioned management functions are planning, organising, leading and control. The distinction between organisation as set of dynamic relationships

and organisation as a social unit enables determining managerial functions connected to business and to organisation separately. The reasons for such a developed definition of organisation can be found in Lipovec (1987: 223-231), Rozman (2012: 12-16), and Rozman and Kovač (2012: 57-60).

Most authors agree that managers influence creativity and innovation within the enterprises. This is especially connected to their role of influencing the behaviour of all employees. Some studies have been also done on the direct influence of managers on creativity and innovation (Amabile (1998: 77-87); Benner & Tushman (2002: 676-706); Coelho & Matias (2010: 324-329); Meissner & Sprengre (2010)).

3.3.2 The managerial style

It could be expected that the managerial style also influences creativity and innovation. The basic distinction between managerial (most authors call it leadership) style is based on task- and employee-centred leadership, which is the basis for distinction between the autocratic and democratic (participative) styles. The following authors (among others) argue that managerial style influences creativity and innovation: Amabile and Khaire (2008: 1-16), Janussi and Dione (2003: 475-498); Politis (2004: 23-34).

3.3.3 The influence of managers' creativity on enterprise's creativity and innovation

It is the main task of managers to ensure that employees are creative and innovative. However, managers themselves should also be creative and innovative in their managerial roles. They can create and use new ways of planning, leadership, motivation and similar; they can seek to find new ways of changing organisational culture, organisational structures, etc. We assumed that creative managers will also assure the creativity and innovation of employees. Kouzes and Posner (1995) and Greenberg (2002) argue that the aforementioned hypothesis is valid.

3.4 Organisational culture

Within different typologies, authors present and discuss different types of organisational culture.

We are looking for the types of culture including the values supporting creativity and innovation. Hellriegel, Jackson and Slocum (1999: 530), and Leavy (2005: 39) claim that organisational culture should be designed, adapted and maintained in order to support creativity and innovation. According to Schein (2004) and O'Reilly and Tushman (2004), the values supporting creativity and innovation are, above all, the acceptance of new ideas, experimentation, trust, taking risk, as well as observing and diagnosing problems and opportunities.

Acceptance of failures (Brodtrick, 1997: 1-4), acceptance of risk and experimentation (Judge et al., 1997: 72-85), initiatives by employees (Amabile (1988: 123-167); Sternberg et al. (1997: 17-21)), inclination to changes (Arad et al., 1997: 42-58), open communication (Martins & Terblanch, 2003: 64-74), acceptance of conflicts (Filipczak, 1997: 32-40), learning and knowledge development (Smith, 2005: 149), knowledge and its dissemination (Amabile, 1997: 42) are the most frequently mentioned values supporting the creative and innovative organisational culture. Some empirical research has also confirmed the impact of culture on creativity and innovation (Amabile (1997); Kanter (1997); Chang & Lee (2007); Hamel & Prahalad (1994); McLean (2005); Meissner & Sprenger (2010); Sanz-Valle et al. (2011)).

3.5 The influence of creativity and innovation on efficiency and effectiveness

We have seen that creativity and innovation are the result of employees and of the organisation's structures, processes and culture. We have also cited numerous authors arguing for the influence of organisational phenomena on creativity and innovation.

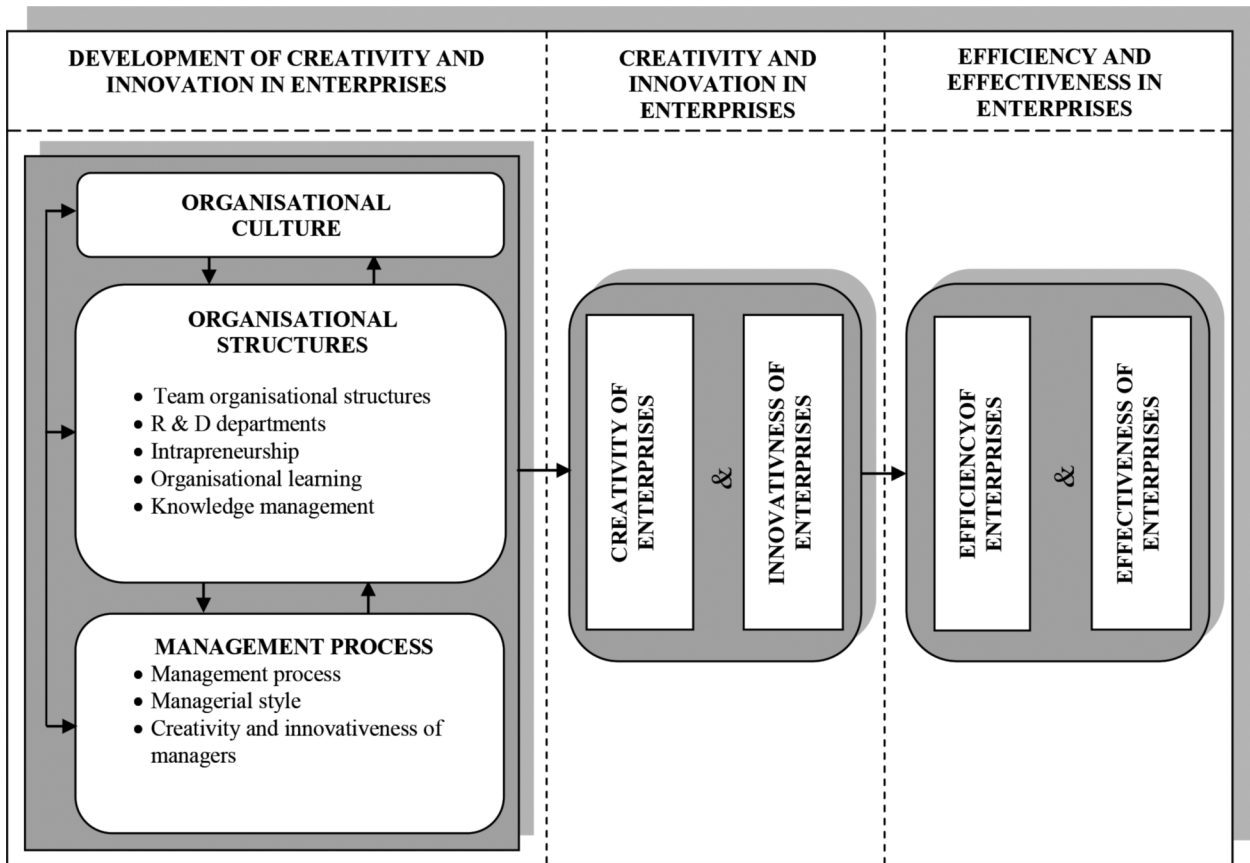
Creativity and innovation are not developed within organisations for their own sake. Their development should lead to the greater effectiveness of the enterprise and to the higher efficiency of its parts. As we also explored the influence of creativity on efficiency and effectiveness, we added both to our model. Effectiveness was represented by ROE, ROA, ROS and EBITDA. Efficiency was represented by revenues/costs, revenues/employees and changes in both.

4. MODEL OF CREATIVITY AND INNOVATION

The theoretical structural model of the development of creativity and innovation within large enterprises, which was the basis with which the validity of the doctoral dissertation thesis and derivative hypotheses was checked (Stjepanović Vračar, doctoral dissertation, 2012), consists of creativity and innovation as a dependent variable that depends on organisational phenomena, i.e. organisational structures, processes and culture, which together form the organisation and keep enterprises and other social units together. We already discussed the organisational phenomena mostly impacting creativity and innovation. We added that

the influence of creativity and innovation on efficiency and effectiveness has also been studied. Furthermore, we can also argue that most organisational factors are mutually correlated and impact one another or are changed for the same reasons. We examined the connection between aforementioned elements and (for the sake of empirical research) set hypotheses, such as 'organisation culture is influencing the creativity and innovation', 'team structures are influencing creativity and innovation' etc. A hypothesis has also been made on creativity and innovation influencing the efficiency and effectiveness. The aforementioned organisational influences on creativity and innovation are gathered in Figure 1.

Figure 1: Structural model of the development of creativity and innovation within enterprises



5. EMPIRICAL RESEARCH AND FINDINGS IN SLOVENIAN ENTERPRISES

5.1 The research question and information about enterprises

In the research, we were interested in the dependence of creativity and innovation in large Slovenian corporations on organisation, i.e. organisational culture, structures and processes. The main question of the research is: **To what extent do organisational phenomena influence creativity and innovation, and do the creativity and innovation influence efficiency and effectiveness?**

As potential candidates for the research, we selected large enterprises, according to the Slovenian legislation (criteria: number of employees, sales value and value of assets). The additional more restrictive criterion was the number of employees (over 100 employees). In 2006, there were 398 such enterprises: 227 industrial, 109 services, 39 in trade, 16 banks and seven insurance companies. Our sample was 200 of the enterprises, which was quite high portion of the entire population. The research was conducted for 2006-2008 period. In 2011, the same research was repeated in some enterprises to detect possible changes. There were some minor and insignificant differences. Consequently, we mainly explained the more extensive research in 2008.

Out of 398 contacted enterprises, we received responses from 200 enterprises. The structure of respondents was remarkably close to the structure of all 398 enterprises.

The questionnaire used a Likert scale and consisted of 12 parts. The first was about the process of creation and innovation, the second part concerned organisational phenomena, while the third part was on efficiency and effectiveness. Enterprises had to evaluate 76 statements. The questionnaire was connected to hypotheses. There were 13 hypotheses, most of them arguing for the influence of a specific organisational phenomenon (culture, team structure etc.) on creativity and innovation; the hypotheses on the influence of creativity and innovation on efficiency and effectiveness have been included, too.

5.2 Statistical analysis

We analysed data and attempted to verify the hypotheses by using following statistical approaches:

- univariate statistics (mean, standard deviation, structure, coefficient of asymmetry, coefficient of flatness),
- bivariate statistics (Pearson's correlation coefficient),
- multivariate statistics (factor analysis, structural modelling).

Statistical analyses have been made with the use of the SPSS program and the Lisrel program (Joreskog & Soerbom, version 8.54, 1996).

First, we attempted to find those variables or answers to questions that describe or confirm the phenomenon (e.g. culture) analysed. The concept of organisational phenomena has been explained by manifesting variables. We used the exploratory factor analysis (Principal Axis Factoring (PAF)) to determine the value of communalities. By using the Kaiser-Meyer-Olkin test and Berlett's test, we proved the fulfilment of conditions of factor analysis to be valid (number of units in research is substantially higher than the number of variables) and the analysed variables are sufficiently connected. By using the Cronbach Alpha test, we showed the reliability of connection of manifesting variables within the analysed phenomena and the latent variable, i.e. the organisational phenomena. The descriptive analysis followed. For each valid and sufficiently connected manifesting variable (question and answers), we calculate the mean, deviation, asymmetry and flatness to study the probability distribution. It appears to be a normal distribution; this guided our further research. We made the described analysis for all influences of organisational variables on creativity and innovation, as well as for creativity and innovation and efficiency and effectiveness.

5.3 Findings of the research

First, we attempted to find the connection between the described organisational concepts, and creativity and innovation. Pearson coefficients show these connections but not their causality. Despite

this, Pearson coefficients have some descriptive value and have been used in the structural model.

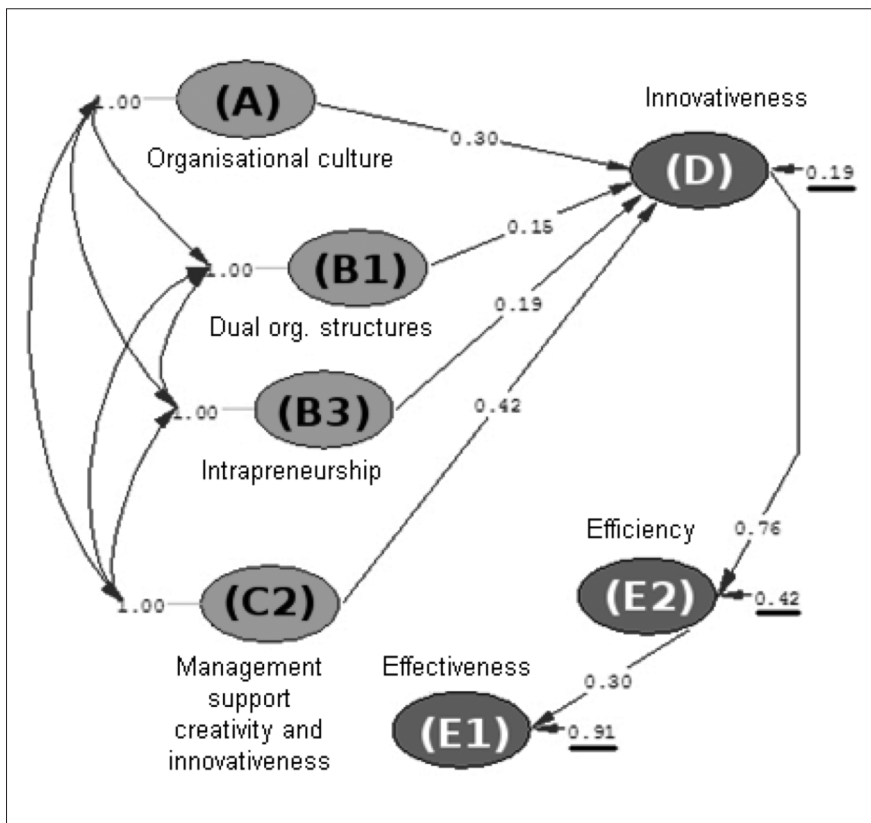
We found that organisational culture, team structures, intrapreneurship, organisational learning, knowledge management and managers' support are connected to creativity (Pearson coefficients between 0.30 and 0.50). We found that organisational culture, team organisational structures, intrapreneurship and the role of managers are tightly connected to innovation (Pearson coefficients over 0.50). We also made the described analysis for parts of population, e.g. for all corporations with existing R&D department, etc.

This analysis was followed by multivariate analysis using our structural model. As already mentioned, we used the Lisrel program tool. The result of this analysis is shown in Figure 2.

We can see from the figure that the managerial support to subordinates regarding creativity and innovation, organisational culture, intrapreneurship and team structures influence creativity and innovativeness the most. The influence of organisational phenomena on efficiency is 58% (quite high) whereas on their influence on effectiveness is only 9% (organisational phenomena on effectiveness directly or indirectly through efficiency); the percentage is probably low because the time lag between efficiency and effectiveness is not considered; it could be also connected to Slovenian culture of following efficiency criteria more than effectiveness ones.

The final structural model also enables us to determine the mutual connections between the concepts of organisation culture, team structures, intrapreneurship and managerial support. The coefficients of connections (parameters β_i) are between 0.40 and 0.78.

Figure 2: Final structural model - review of manifest variables, their connections and connections to innovation and efficiency and effectiveness (n=200)



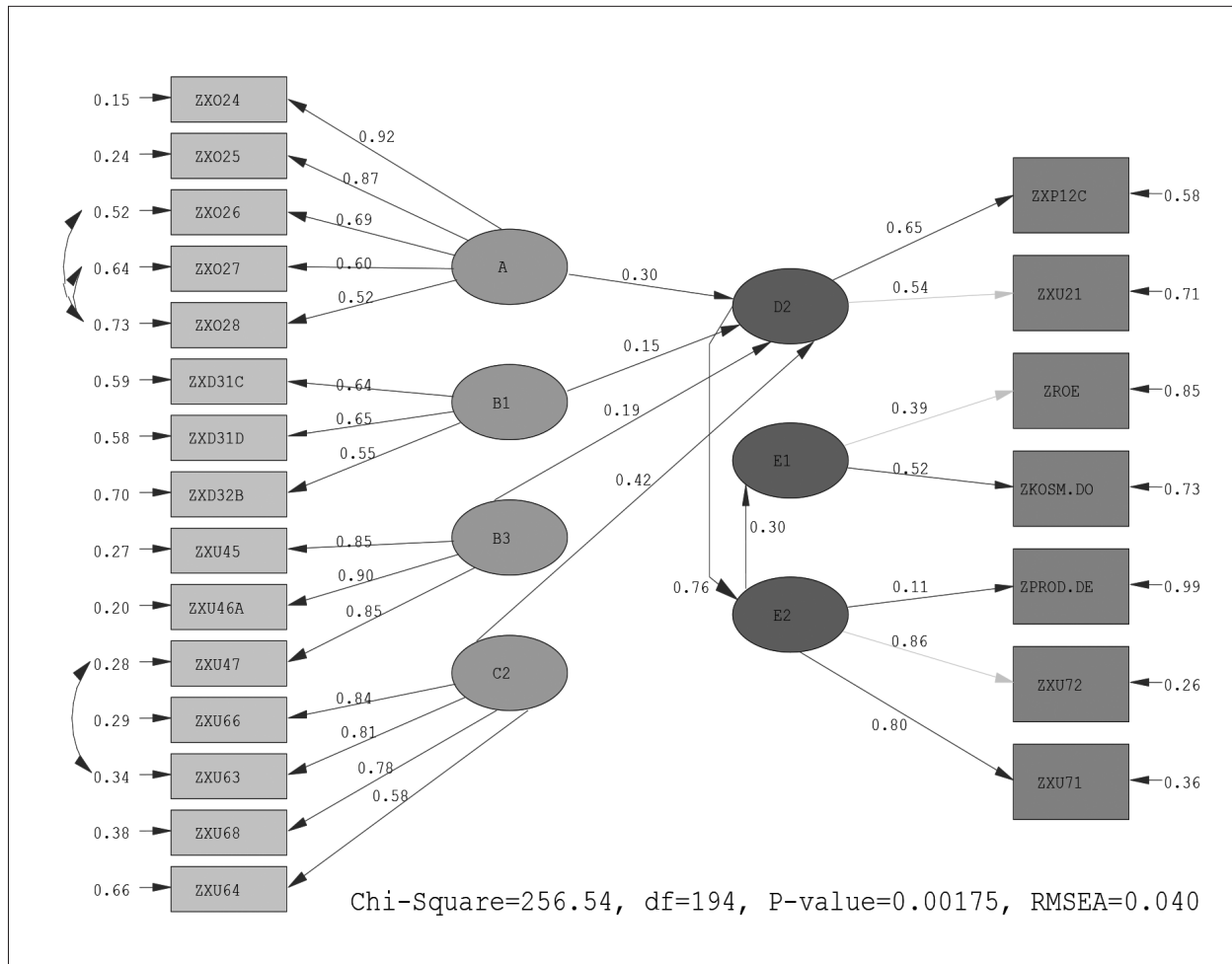
Comment: All connections except team structures and efficiency and efficiency and effectiveness are statistically valid ($|t| \geq 1,65$).

We also checked the fit between the model and the data. Different measures as Hi square, RMSEA, NCP etc., according to Diamantopoulos and Siguaw (2000), show high fit between the model and real data, which proves the validity and the quality of our model.

The final structural model is shown in Figure 3.

Organisational culture, team organisational structures, intrapreneurship and management support to creativity and innovation support creativity and innovation of the enterprises. Innovativeness, efficiency and effectiveness depend especially on some manifest variables or survey questions. Thus, **organisational culture (A)** is especially connected to encouragement of new ideas (ZX024), changing ideas in successful use (ZX025),

Figure 3: Manifest and latent variables and their inter-standardised connections (final structural model)



awareness of employees of the importance of creativity and innovation (ZX026), open and relaxed climate (ZX027), and acceptance of risk (ZX028). **Team organisational structure (B1)** is above all connected to problem teams (ZXD31C), innovation teams (ZXD31D), and formal teams (ZXD32B). **Intrapreneurship (B3)** is tightly connected to enterprise support of intrapreneurship (ZXU45), existence of active internal entrepreneurs (ZXU46A), and support from the hierarchical activities (ZXU47). **Management support for creativity and innovation (C2)** is crucial due to encouragement of employees to innovate (ZXU66), influencing the organisational culture supporting creativity and innovation (ZXU63), supporting employees in creativity and innovation process (ZXU68), and creativity and innovation supporting leadership style (ZXU64).

Management support for creativity and innovation, organisation culture, intrapreneurship and

team structure influence **the innovativeness (D2)**. Its objectives have been realised especially through breakthrough improvements (ZXP12C) and in the generation of annual income (ZXU21).

Efficiency (E2) has influenced effectiveness and has been seen as increase in labour productivity (ZPROD.DE), higher efficiency (ZXU72) and lower input in labour and other resources (ZXU71).

Increase in **effectiveness (E1)** has been above all shown in the increase of return on equity (ZROE) and gross income (ZKOSM.DO).

We also used another method to determine the variables influencing the innovation. We used **decision trees** as one of data mining techniques. As more of dependent variables cannot be used by this method (innovation depends on creativity), we only analysed the influences on innovation.

The result of this analysis is that the following hypotheses have been confirmed:

- the influence of organisation culture on innovation;
- the influence of team structures on innovation;
- the influence of intrapreneurship on innovation;
- the influence of individual's knowledge on innovation, and,
- the influence of creativity and innovativeness of managers on innovation.

The results are similar but not identical to results of the structured model. The mentioned organisational variables (organisational culture, team structures, intrapreneurship, managers' supports for creativity and innovation) have mostly influenced the innovation and creativity. Other variables (R&D departments, organisational learning, knowledge management, managerial support and management style) have been found to be less relevant for creativity and innovation, and corresponding hypotheses have not been confirmed.

Some of the hypotheses have been analysed by **using the method of correlation coefficients**. On this basis, the influences of organisation culture, of intrapreneurship, and of managerial support on innovation have been confirmed and also the influence of innovation on efficiency. The influences of team organisation structures and the influence of efficiency on effectiveness cannot be confirmed. For other hypotheses, the connection between each influencing variable and innovation has been confirmed but not in the case of multivariate analysis.

Some more analyses have been conducted comparing different groups of enterprises.

5.4 Conclusions from the empirical research

In our research, we attempted to establish the relationships between different organisational phenomena: culture, structures and processes as independent variables, and creativity and innovation as dependent variables. We used different approaches to verify our hypotheses on the validity of mentioned influences. On the basis of all the methods used, we can argue that the following hypotheses and corresponding influences can be confirmed.

In large Slovenian corporations, creativity and innovation are above all the result of:

- **organisational culture,**
- **team organisation structure,**
- **intrapreneurship,**
- knowledge of connected individuals,
- creativity and innovativeness of managers themselves,
- **managerial support of employees for creativity and innovation.**

Via the statistical methods mentioned and used in the research, some more influences have also been confirmed:

- the influence of organisational knowledge on creativity and innovation,
- the influence of knowledge management on creativity and innovation,

whereas the influences of R&D departments and managerial style do not or do less influence innovation and creativity.

We also proved that creativity and innovation influence efficiency to a high degree, but effectiveness less so. We also found that many variables have been related or act in a combined way. We can also see from the theoretical part of the research in what way large corporations manage themselves in order to achieve higher creativity and innovation and, in the empirical part, what ways are most common in large Slovenian corporations. However, our research remained at a large and not-detailed level. For example, we found that organisation culture influences creativity and innovation, but we did not analyse what type of organisational culture and in what corporations makes the most impact. It would be advisable to continue such more detailed analyses.

6. CONCLUSION

In our theoretical and empirical research, we started with the idea that creativity and innovation within enterprises depend on individuals and their traits as well as on their relationships. We defined organisation as set of all relationships and determine organisation as consisting of organisational

structures, organisational processes and organisational culture. In the theoretical part, we attempt to show (also by quoting different authors) the influences of organisational phenomena on creativity and innovation. We concluded that organisation (relations and interactions among employees) influence creativity and innovation.

In the empirical part, we were interested in determining which organisational phenomena influence creativity and innovation in large Slovenian enterprises. We found that Slovenian large enterprises are creative and innovative; these two phenomena are mostly influenced by organisational culture, team structures, intrapreneurship and managerial support of employees to act in a creative and innovative way. The influence of other organisational phenomena was found to be less weighty or statistically not significant. We also found a strong impact of creativity and innovation on efficiency but less on effectiveness, which might be due also to the fact that enterprises mainly seek technical changes and improvements and care less for financial results.

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