

Empowering and rewarding innovation in the manufacturing industry: Managers' perspectives

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Abstract

Orientation and motivation for the study: With rapid changes in technology and global competition, the success of many organisations had become increasingly dependent on the ability of launching innovative products and services. Croatian organisations had no specific framework to guide the innovative knowledge and experience of employees successfully.

Research purpose: The purpose was to examine current practices and innovative systems for stimulating and rewarding innovation in Croatian manufacturing companies.

Research design, approach and method: This study demanded a qualitative approach and individual interviews to collect data from senior managers who were responsible for the implementation of incentives to reward innovative ideas of employees.

Main findings: Findings indicated innovative methods to reward employees and management recommendations to improve the reward system. A need existed to establish professional bodies to assist in managing innovations.

Practical and managerial implications: Developing an innovative environment required a range of management measures. An innovative team would help innovators through project funding and monitoring of the innovation process.

Contribution and value-add: This research had predominantly been in small and medium manufacturing enterprises in Croatia. The study suggested recommendations to improve their innovation potential and business performance by employing innovative strategies relevant to global demands for innovative outputs and competitiveness.

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Key words: innovation, managing innovation, entrepreneurship, rewarding strategies, knowledge management

1. Introduction

The problem of retaining a nucleus of high-quality personnel over the long term and motivating all employees to ensure maximum involvement, identification with the company and constant creative contribution, includes the question of how to reward their work. The transformational nature of companies and the constant need for managing changes affect employees that demand an urgent answer to the question of how to structure the innovation systems.

Most successful Croatian companies rely on a model of corporate culture that is based on a hierarchical organisation guided by the principles of authority of managers or owners. Very few of them have a flexible model of corporate culture guided by the principles of an innovative culture including teams as the fundamental wealth of the company. Only the deployment of innovation can provide economic growth and the growth of employment in Croatia (Antoljak, 2011).

Based on the perceived problem that only few companies stimulate and reward innovation, the interest and attention of researchers of this study focused on manufacturing companies in the metal industry in Croatia. Thus, the purpose of this paper is to show how innovation is stimulated and rewarded in various manufacturing companies in Croatia. Furthermore, the purpose is to determine specific methods of stimulating and rewarding innovation, and their implementation in the business context.

To this end it is necessary to examine the opinions of managers on innovation and the problems relating to rewarding innovation. How the existing reward systems could be

improved and what are the experiences of managers with regard to innovation in the business environment. Based on the aforementioned problem of rewarding innovation and the purpose of the study, this study raises the following research questions:

1. *What methods of stimulating and rewarding innovation are currently used in manufacturing firms?*
2. *What are the problems of rewarding innovation?*
3. *How can rewarding innovation in the organization improve?*

The next section describes the theoretical framework in order to understand, stimulate and reward innovation in the manufacturing organizational environment.

2. Framework to stimulate and reward innovation in the manufacturing organisational environment

2.1 Creativity and innovation in the global environment

With rapid changes in technology and global competition, the success of many organisations has become progressively more dependent on their ability to bring innovative products to market (Mumford, 2000). Talent is the bedrock of a creative society (Yusuf, 2009). According to Howkins (2001) development and commercialisation call for expertise, ingenuity, and entrepreneurial creativity in order to achieve success.

Open innovation is currently one of the most debated topics in management literature (Gumusloughlu & Ilsev, 2009; Chiaroni, Chiesa & Frattini, 2011). In recent years, many companies have shifted from so-called closed innovation processes toward a more open way of innovating, for instance through cooperation with suppliers and competitors or through active searches for new technologies and ideas outside the firm (Rost, 2011).

Many established corporations make equity investments in young technological start-ups to enhance their innovation effectiveness (Anokhin, Örtqvist, Thorgren & Wincent, 2011). How companies can simultaneously achieve both exploration of new knowledge for radical innovations and exploitation of existing knowledge for incremental innovations is still one of the key dilemmas in organisational learning research (Dobre, 2005; Un, 2010). The next section will discuss the importance of innovation as a competitive advantage.

2.2 Innovation as a competitive advantage

The effect of today's turbulent environment means that organisations need to improve their competitive advantage and respond swiftly to changing technology and markets (Brennan & Dooley, 2005; Mishra, et al., 2010; Govindarajan & Gupta, 2001). If a company is unable to continue to innovate, it risks falling behind competitors who aim to take the lead by changing their products, refining their manufacturing processes or applying innovation in their business models (Prester, 2010). It should be noted that regardless of the technology, social and market conditions, the key to creating and maintaining a competitive advantage is in continuous innovation. The owner of the rights of one technology could benefit from the existence of complementary technologies (West, 2009).

2.3 The process of innovation

The literature on systems of innovation conceptualises innovation as an evolutionary and social process of collective learning. But three main questions remain open: Is this learning process internal or external? What are the boundaries of this process? Is this

social process voluntary or rather unintended? In his paper Ronde & Hussler (2005) strives to answer those questions by analysing the determinants of regional innovative levels in French manufacturing industries. It is suggested that regional innovative policies should be focused on welcoming different sectorial activities and on supporting networks among regional actors. Unlike product replacement planning, innovation performance requires planning that is more strategic, proactive, a long-term oriented and development-focused (Terziovski & Morgan, 2006; Langerak & Hultink, 2008). Organisations recognise that knowledge workers with the requisite skills and expertise are critical to improving innovation performance.

2.4 Managing the processes of innovation

The use of research and development expenditure or more direct measures of innovative output, such as productivity growth, might prove useful for a more complete assessment of the contribution that investors make to an acquired firms' innovation activity (Ughetto, 2010).

According to Prester (2010) the construction of external interactions is more important than development of internal innovative capabilities. Managers need to ensure a strategic approach to management of the innovation cycle and to identify critical success factors that are intrinsic to the achievement of corporate goals (Umesh, Lawrence & Lowe, 2010). Furthermore, development of evaluation systems and data connectivity would greatly facilitate monitoring and commercialisation of this process, by identifying where in the innovation cycle improvements is needed.

2.5 Teamwork and innovation

Although much has been written about the benefits of teamwork in innovation, it should be borne in mind that teams are not always the solution. Hoegl and Parboteeah (2007) observe teamwork in different contexts and emphasise the importance of proper selection of the members and of the development of a team for a specific and straightforward task. The reason for organising the work in teams is the complexity of the work that exceeds the cognitive capabilities of individuals. According to Feather (West, 2009) the information age entails real economic, technological, sociological and historical changes that influence innovation outcomes.

2.6 The impact of transformational leadership on innovation

Jung (2008) considers transformational leadership as encompassing five theoretically distinct components: charisma, idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. His study seeks to advance understanding of how transformational leadership by top managers (CEOs) can affect their companies' innovativeness, so he proposes a model that includes both direct effects and indirect effects, moderated by aspects of organisational culture, structure and the external environment. A leader's behaviour may be perceived as an organisational endorsement of promotion-focused or prevention-focused concerns and this perception will influence employee behaviour by eliciting a congruent state of regulatory focus (Wu, 2008).

In his study Gumuslouglu, and others, (2009) propose a model of the impact of transformational leadership both on followers' creativity at the individual level and on innovation at the organisational level. Makri & Scandura (2010) introduces two

dimensions of strategic leadership, termed operational and creative, specifically developed for top executives of high-technology firms. The 2010 research results of Makri and others confirm the expectation that there is a positive relationship between transformational leadership and organisational innovation. The next section deals with stimulating and rewarding innovation.

2.7 Stimulating and rewarding innovation

Economic studies that aim at comparing the patent system's social efficiency versus an ex-post reward system rest on an outdated view of patents (Penin, 2005). They assume that firms use the patent system only in order to be granted a short-term commercial monopoly rent. While it seems that many companies develop a successful innovation only by chance, a few other companies enjoy consistently rewarding innovation. Leenders & Corne (2007), in his study, signal detection theory, shows that it may be less important to improve innovation practices in companies than it is to change the nature of the projects that enter the corporate innovation funnel. Financial reward is an essential element in fostering innovation.

2.8 Rewarding innovation in financial terms: models and project financing

Systems of incentive pay for performance are shaped by the established activities of the company, strategy, organisational culture, management style and model of corporate governance. Models form a stimulative element in wages: a stimulus for increased performance on the basis of experience, a stimulus for daily output – project work, a stimulus for monthly effect, a stimulus for results, sharing of the profits of innovation and

rationalisation in the business, premiums and bonuses for the achievement of annual goals and stimulating reward for overtime work (Tadin, 2007).

There are many good ways and methods for forming a model to stimulate work performance through payment (Tadin, 2007; Čurčija, 2007; Bis, 2009). Additionally, top managers are expected to propose a concept for a system of incentive rewarding for performance and to adapt it to the specific conditions in which the company operates (Tadin, 2007). According to Bis (2009), project finance has never been applied to an entity engaged in the production, acquisition, and monetisation of patent assets.

2.9 Stimulating entrepreneurship as a way of rewarding innovation

Subramanian (2005) presents a model of an employee–firm interaction in which a private intrapreneurial activity competes with the basic activity of the firm. The parent firm lacks ownership of any new asset created through intrapreneurial activity, but asset complementarity gives it an advantage over outsiders. Menzel, Aaltio and Ulijn (2007) describe how to make engineers active in the field of intrapreneurship within large firms.

There is an emerging stream that positive emotion may enhance entrepreneurial creativity, which can aid in the recognition of new opportunities. The entrepreneurs who are passionate about their ventures may be more creative and persistent, and may become more absorbed in venture-related activities, which should enhance key venture outcomes (Cardon, 2008).

According to Goodale, Kuratko, Hornsby & Covin (2011), research on the topic of corporate entrepreneurship has expanded steadily over the last few decades, in large part owing to the increasingly recognised linkages between product–market and technological innovation (i.e. the consequences of corporate entrepreneurial activity) and firms' success. An entrepreneurial work environment is characteristic of small, emerging private enterprises in which "everyone does everything" and where everybody feels equally responsible for the efficient functioning of the organisation. The entrepreneurial approach is particularly advantageous in conditions of mutual dependency in respect of tasks (Srića, 1997).

2.10 Motivational aspects for non-financial stimulation and rewarding of innovative activities

According to Sladoljev (2007), financial rewarding is a necessary but insufficient condition for developing a broad base of diverse motivational behaviours within a company. The motivational basis is extended by group reward systems that, apart from material rewarding, include a participation in a goal setting and decision-making, autonomy and responsibility, shaping operations, collaboration and flexible working hours (e.g. Wei & Kwaku, 2009).

There are numerous techniques for developing creative skills, such as the analytical technique, which includes listings, the input–output technique, "for" and "against" technique, technique of free flow of associations, brainstorming techniques and Gordon's method (Sladoljev, 2007). Motivation, creativity and performance evaluation play an important role in a work success process (Sladoljev, 2007).

2.11 Current innovative activities within Croatian manufacturing companies

Croatian manufacturing companies consider the most important innovative activities as those that form part of the management vision of the enterprise, personnel and research potential of the company and market information. Various incentives for innovative activity are relatively low-ranking. Barriers to innovative activities for Croatian companies are lack of funding, too long a period of return and the innovation potential of small businesses (Andrijević-Matovac, 2005).

The main obstacle to innovative activity of the average enterprise in the Croatian economy is resistance to introducing changes in the company. Also, through evaluation and benchmarking, there should be a mutual learning process involving the state administration in order to support the development of more effective innovation (Švarc & Lažnjak, 2008). For example, the Japanese government has started to use a systemic approach to reforming the national science and technology innovation system of Japan, that it is geared toward reinforcing policies to stimulate innovation in corporate sectors (Motohashi, 2003).

3. Research Methodology

This research can be described as a qualitative multiple case study, which is the result of research in a closed context (Creswell, 1994; Merriam, 1998; Yin, 1994).

3.1 Sample, intervention and methods of data collection

The study sample consisted of three manufacturing firms in which the researchers investigated the stimulation and rewarding of innovation processes and outcomes. The

interview method involved the managers in companies who were responsible for the implementation of rewarding innovation systems. The participants were a company director, an innovation manager and a production manager.

Data were collected using semi-structured individual interviews. A trained researcher conducted the interviews in a somewhat natural atmosphere. The interviews lasted an average of 30 minutes each. The researcher manually recorded the answers of the participants. The researchers of this study used a broad set of ideas, theoretical frameworks and different paradigms by which the interview questions were created in the interview protocol. The researchers established contact with the companies via e-mails.

3.2 Data analysis and assessment of trustworthiness

Analysis of the interviews entailed the studying, categorising and tabulation of data in order to focus on the initial hypothesis/research questions (Yin, 1994). Themes that were described through the analysis of the data were segmented into categories and subcategories in alignment with Creswell's guidelines, (1994) which were described and supported by evidence. The constant comparative method (Merriam, 1998) was applied to the data gathered during the interviews.

The main procedures that could provide scientific correctness (rigor) to the study were closely connected with the basic metric characteristics of qualitative studies such as validity, reliability, objectivity and standardisation (Cresswell, 1994; Yin, 1994; Merriam, 1998). All information collected in the interviews was strictly confidential and was available exclusively for research purposes. Strategies proposed by Merriam (1998) and

the concept of internal validity (Yin, 1994) improved the internal validity of the study. An in-depth description of the research phenomenon that was embedded in a theoretical framework contributed to the external validity (Merriam 1998) of this study. Researchers carried out the necessary preparations in order to prove the essential competencies in the activities, including clarification of prejudices and assumptions, and exploring the social context of the entire cases (LeCompte, Preissle & Renata, 1993). This should increase the validity and reliability of the results.

4. Results: Evidence in terms of innovation in manufacturing companies

This section presents the findings of the qualitative data analysis of interview data in three Croatian manufacturing companies regarding stimulation and rewarding of innovation. For the purpose of this study, the researchers named companies as A, B, and C.

Based on the interview statements of the participants the data were analysed using methods of comparison, which led to the derivation of categories that are shown in Figure 1. Thus, specified symbols for categories **a–k** for companies **A**, **B** and **C** are presented in Figure 1, followed by interview reports of the participants.

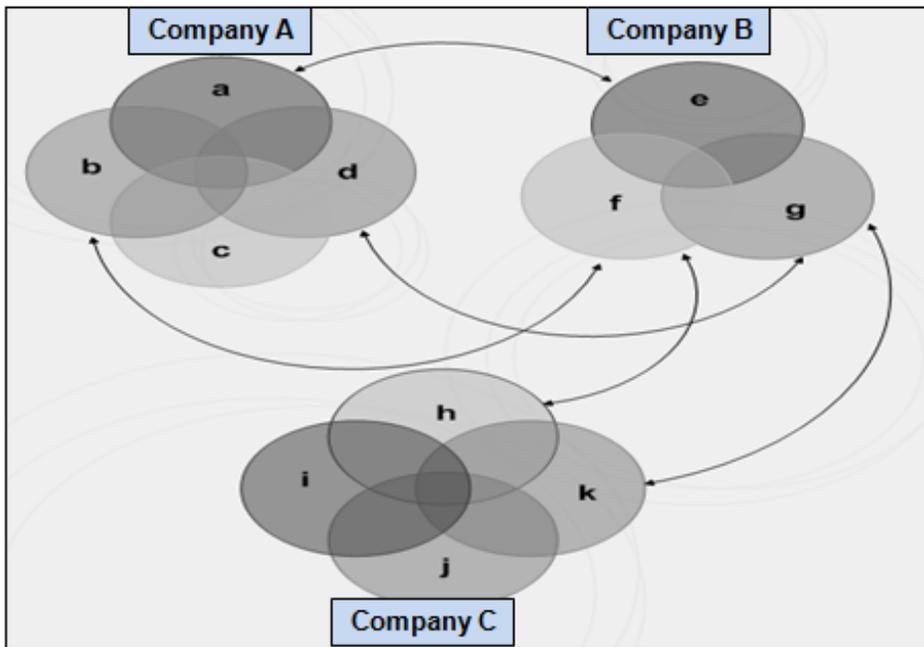


Figure 1: Categories in terms of stimulating and rewarding innovation

Figure 1 shows the logical sequence and coherence of categories in all three cases examined. The categories are described in the following section:

Company A: Case 1

- a. *There is no developed industrial structure that would encourage innovation.*
- b. *Inadequate innovative culture and political will at national level do not induce rewarding innovation at existing industrial platform.*
- c. *There is a need to establish a unit for the financial support of innovators from prototype to series of innovative outputs.*
- d. *Weekly review of innovation proposals should be undertaken by a commission for the monthly rewarding of adopted innovative ideas.*

Company B: Case 2

- e. *There are no examples of good practice to organise innovative projects at the national level that would serve as a model for innovators.*
- f. *The business environment is poor and the innovation infrastructure is inadequate.*
- g. *It is necessary to introduce new mechanisms for rewarding innovation.*

Company C: Case 3

- h. *Marketing of innovation in national, regional and global markets is insufficient.*
- i. *Lack of motivation for employees' innovation causes a low innovative culture.*
- j. *Management is not sufficiently active regarding policies of rewarding innovation.*
- k. *Financial rewarding of innovation on a monthly basis causes conflict among employees.*

Using comparative analysis (Merriam, 1998; Konsa, 2007), the researchers chose the relevant answers relating to the categories derived from each of the interview transcripts and these were discussed in the following sections as evidence.

Evidence: Company A

Categories a–d showed the experience of the innovation manager in respect of rewarding innovation in the company A.

a. There is no developed industrial structure that would encourage innovation.

The innovation manager of company A stated that “...*here is no developed industrial production that would encourage innovation...Innovations implies strong industrial production, which, in Croatia, is not the case because of the tendency of declining industrial production and extinction of large factories ...*”.

b. Inadequate innovative culture and political will at national level do not induce rewarding innovation at existing industrial platform.

The innovation manager further reported that, " ... in the last two decades we were witnesses of a process of decline of the entire industry ... the key problem is political will at national level, which should stimulate industrial production."

c. There is a need to establish a unit for the financial support of innovators from prototype to series of innovative outputs.

Furthermore, the innovation manager pointed out: "Any innovation should have a specific speed. The path from concept to construction and finally placement on the market should be as short as possible. It is not enough to carry out the innovation; the ultimate goal of innovation is its application in practice. It is important that the innovation has an economic aspect and that it is financially viable. There are various positive examples of innovation activities, but innovations are often poorly recognized and state policies do not encourage production sufficiently."

d. Weekly review of innovation propositions is undertaken by a commission for the monthly rewarding of adopted innovative ideas.

The innovation manager said: "A reward system in which a committee reviews proposals for innovation is suitable in companies which produce a large range of products, where each small saving in production can lead to significant reductions in production costs. In this example, where the company produces different components for the automobile industry and the manufacturing is cost-effective, the reward system mentioned is a

logical choice. Croatia does not have developed industrial production and very little attention is still paid to innovators at national level. "

Evidence: Company B

Categories e-g indicated the opinion of a director in the second company.

e. There are no examples of good practice to organise innovative projects at the national level that would serve as a model for innovators.

The director in the second company commented that: *"There is no organized management of state projects ... The actual value of project management is difficult to define and even harder to measure ... Projects in companies are conducted in phases and that is the way they should be conducted by the government at national level... Innovations should have a clear timeframe from an idea to the market realization."*

f. The business environment is poor and the innovation infrastructure is inadequate.

The director further commented: *"The business environment is in poor condition and the innovation infrastructure is inadequate." Every major city in Croatia should have a technological innovation centre, which Zadar still doesn't have, even though much has already been done in this respect. It should work continuously on improving innovation. The construction of such a centre would help to set up mechanisms for the improvement of existing technologically innovative companies and would help to improve knowledge transfer from the university and innovation centre into the economy."*

g. It is necessary to introduce new mechanisms for rewarding innovation.

The director said that "... It is necessary to introduce new mechanisms of rewarding employees. An employee's salary depends on the tariff groups, payment factors, salary increments and gross increments from the employer. Gross increments depend on motivation, knowledge, skills, expertise, human relations, cooperation and teamwork, as well as on ethics and collegiality ... Stimulus is given to an employee once or twice a year as a reward for innovation ... That kind of stimulus is an open category of the salary and the manager decides on it according to his own opinion".

An inadequate innovation infrastructure was an aggravating circumstance, but there were positive examples of stimulation and rewarding of innovation in companies.

Evidence: Company C

Categories labelled h–k represent the responses of a head of production in the third company.

h. Marketing of innovation at the national, regional and global markets is insufficient.

The head of production revealed that "the problem is the placement of innovations on the market ... Many innovations do not reach the last stage, i.e. the marketing stage. Innovation is not successful if you do not achieve market success, therefore it should be applied in practice ...".

i. Lack of motivation for employees' innovation causes a low innovative culture.

The head of production commented: "In many companies there is no reward for innovation. Employees are not trying enough because they are not motivated ... It is

common for the notion of rewarding innovation not to exist in many manufacturing companies. Employees only carry out current operations and are not motivated to refine or improve anything. Another problem is the outdated technology. The current recession has further exacerbated the existing poor state of the industry ... "

j. Management is not sufficiently active regarding policies on rewarding innovation.

The head of production further elaborated: *"Management is not sufficiently active regarding policies on rewarding innovation ... As can be seen in the theoretical frame of the paper, management is responsible for introducing the policy of rewarding innovation. Inactive management and a poor business climate in the company result in the absence of rewards. An absence of rewards shows that the company has no long-term strategy for employee development"*.

k. Financial rewarding of innovation on a monthly basis causes conflicts among employees.

The comments of the manager were: *"Financial incentives on a monthly basis cause conflict among employees. Financial incentives are given on a monthly basis to employees in manufacturing. The company produces a variety of machine tools according to customer specifications, so it is challenging to introduce innovations in the manufacturing process because they do not contribute significantly to savings. Another problem is outdated machines because the company does not invest in new technology. Stimulation in this case causes conflict between the workers and creates just the opposite effect from the one desired. Management is inactive and in the third case studied, rewarding innovation simply does not happen."*

It was important that innovations passed through all stages, from prototype through to mass production. The business environment and inadequate innovation infrastructure aggravated the situation. Positive examples of rewards related to incentives, where the stimulative part of the salary that were dependant on the innovativeness of employees. It should be further noted that awarding financial incentives on a monthly basis sometimes caused conflict among employees rather than motivating them. Thus, successful development of production required a technological innovation centre. The next section gives answers to the research questions and interpretation of the results obtained.

5. Discussion

The first research question sought to determine *the methods of stimulating and rewarding innovations* in the companies that were analysed in the study. Of the three companies in the sample, two applied a reward system and stimulated innovations of employees. Companies were differentiated by the type of production, so the same model of rewarding could not have been applied in the production of machine tools and in the production of a series of the same components.

A turbulent environment encouraged organisations to improve their competitive advantages and quickly respond to new technologies and changing markets. There was growing awareness among regional authorities that the economic growth and competitiveness of the region largely depended on the capacity of local companies to innovate.

Providing adequate support to local companies to become more competitive through innovation was of increasing importance in the regional political agenda. In Croatia little attention was still paid to industrial production. Technological innovation centres were opening in major cities to encourage industrial development. While it seemed that many companies developed successful innovation only by chance, a few companies experienced consistently rewarding innovation.

Knowledge management was explicit and systematic management of vital knowledge and the associated processes of creation, organisation and dissemination of innovation were necessary for the company's success. Comprehensive communication and collaboration had inspired the development of new ideas, technologies and practices through a community of employees. Many innovations were also the result of teamwork. It sought to improve understanding of how the transformational leadership style of top management affected the company's innovativeness. The key to future competitiveness in high technology was the ability to innovate. Understanding the mechanisms through which firms created knowledge showed that innovation was only at its beginning.

The company management was an important factor in the ability to innovate because the director had a great influence on the development of organisational vision and strategy to achieve it. The theoretical part was reflected in case studies from companies where the management was inactive with regard to rewarding innovation.

The study had shown a positive example of rewarding innovation through financial incentives, although it should be analysed how effective those incentives were in

practice (case 2). For a company that produced a product series, every saving could result in reduced costs. A commission that would examine innovative proposals on a weekly basis seemed like a logical choice (case 1). In the production of pre-ordered machine tools, the selection of appropriate methods of rewarding was not an easy task, because there were different stages in production and it was not easy to determine which was of greater importance (*in response to question 2*).

In answer to the third question about *improving the method of rewarding innovation*, it could be said that every company required a special model of rewarding innovation through which employees' innovativeness could have been motivated. The model should be adapted to particular conditions of production. Human resource management strategy largely depended on the environment and cultural traditions of each company. There were many good ways or methods for creating stimulative models of payment for work performance, but usually there was only one optimal model that was quantitatively and qualitatively effective in every company, taking into account the existing competencies of employees. Monthly stimulation was not always the solution and it could be harmful and cause conflict among employees. The next section presents the most important conclusions and recommendations of this paper and areas for further research.

6. Conclusions and recommendations

Organisations are faced with a dynamic environment characterised by rapid technological change, shortening product lifecycles, and globalisation. Especially technologically oriented organisations need to be creative and innovative to be able to

survive, compete, grow and lead. Business organisations are becoming increasingly dependent on creativity.

Systems of paying incentives for innovative performance are shaped to accommodate the established activities of the company, its strategy, organisational culture, management style and business enterprises. A system for rewarding experts' innovative performance involves shaping a strategy of financial and non-financial rewards that will enable achievement of the defined innovative plans, as well as annual and strategic goals. It is important to assess the position of the organisation, to identify areas of improvement compared to global benchmarks and then to work on a plan for transition to the global level, including the development of a leading organisation.

A recommendation for future research is to explore the attitudes of employees in companies that reward innovation with the objective of determining the extent to which the reward model is applied.

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