

ON THE CO-EXISTENCE OF INNOVATION AND CREATIVITY IN THE LEAN MANAGEMENT ENVIRONMENT

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ABSTRACT

The innovativeness and creativity of companies are of particular significance in terms of shaping competitive position. Both of these phenomena should co-exist and interact with each other. The aim of the paper is the preliminary identification of the determinants of innovation and creativity in enterprises and their bilateral coordination in the Lean Management environment. In order to accomplish the aims of the research, a study of the subject literature (on the theoretical level) was used, as well as the results of empirical research conducted on the basis of a case study within two companies. Thanks to the literature review, the assumption about the need to integrate and coordinate activities in the area of creativity and innovation was made. Case studies have shown that, in practice, unnecessary artificial divisions of these areas of the company's operations are created. In both the theoretical and empirical layers, the necessity of continuing research into the given problem was confirmed.

KEY WORDS

Innovation, creativity, Lean Management.

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Introduction

The terms *innovation* and *creativity* are some of the most commonly used terms in the ongoing public debate, as well as in scientific and private discussions, concerning the economy. The reasons for this are obvious and not questioned. The scale and efficiency of processes and phenomena described using these terms, regardless of some differences in the interpretation of their meaning, determine the effects of business activities on the micro- and macro-scale. Each of these dimensions in the Polish economy contains reasons to be dissatisfied with the level and dynamics

of these effects. As the above theses are obviously and commonly recognised both in theory and in practice, this seems to be sufficient justification not to proceed with further documentation and confirmation thereof.

The aforementioned debates and discussion more often concern innovation, especially in combination with entrepreneurship (Bratnicki 2002; Squicciarini 2017; Urbaniec 2018). In connection with Schumpeter's fairly widespread understanding of entrepreneurship, this seems to be reasonable. However, the necessary innova-

tion – in all possible forms of expression and scopes – should be accompanied by a relatively high level of creativity (Amabile 1996; Dawson and Andriopoulos 2014; Thomas 2009). In other words, the point is not to promote and introduce just any innovations, but to increase the share of original, creative innovations. Economic practice in many countries, including Poland, cannot manage this need to a satisfactory degree. At the same time, there is no proper support for the development of innovation and creativity from science (management theory), while many of the scientific achievements embodied in contemporary concepts and methods of management contain elements of such support.

One of these concepts, largely based on innovation and creativity, is Lean Management (LM) (Lindskog et al. 2017; Miller et al. 2014; Sehested and Sonnerberg 2011). This concept, with a firmly rooted principle of continuous improvement, is gaining increasingly widespread application and recognition in many sectors of the economy, as well as in the non-economic sphere. In this situation, it seems obvious and natural to ask more detailed research questions which are, in our opinion, cognitively and applicably significant, including but not limited to:

- how to systematise types (areas, scopes) of the innovativeness of enterprises for cognitive and practical purposes,
- what the possible and the desired relationships between innovativeness and creativity in companies are,
- which factors condition the development of innovation and creativity in companies and what the mechanisms of their impact are,
- what the scope and degree of both the possible and the desired impact of systemic solutions in the sphere of company management on both the

course and the results of the development of innovation and creativity in companies are,

- whether innovation and creativity could find support in the conditions of using and developing the LM concept in companies, in its "environment", and if so, to what extent.

A reliable and sufficiently exhaustive search for answers to these and related questions would require the more comprehensive conceptualisation, preparation and implementation of relevant research, probably in the form of numerous related research projects.

The aim of this study fits within the phase of conceptualisation of part of such research. In particular, we want to focus on the initial identification of conditions for innovation and creativity processes in companies and their mutual coordination, with particular focus on the conditions on part of the management system and the LM concept, using literature data, our own passive and active observation of processes which are the object of our interest and which take place in the "environment" of LM, as well as by means of a case study carried out in several entities experienced in implementing the LM concept. This is a highly exploratory goal, focused on creating conditions which enable the design of a more specific subject- and problem-related field of research, and - at later stages – detailed questions and research hypotheses as well as research methods and tools (identification, measurement).

1. Literature review

The issues of innovation and creativity have been explored deeply, both in literature and in practice in terms of the functioning and development of companies. Innovativeness is a feature of learning organisations which are flexible, adaptable, and focused on development. The terms

innovativeness and innovation have multiple meanings and are difficult to interpret precisely. They are often associated with other synonymous terms, e.g. streamlining, modernisation, novelty, creativity, or unconventional solutions. Innovation is an idea, action or thing that is new and of better quality.

Innovativeness can be identified as the capacity and motivation of a company to constantly search for scientific research results, new concepts, ideas, and inventions and use them in practice. Innovative companies are considered to be companies that create, absorb and acquire new products, technologies, and organisational solutions, as well as those characterised by the ability to continuously adapt to changes occurring in the environment (Serafin 2014).

The results of innovative activities are innovations that can be classified according to various criteria. Considering the criterion – the object of innovation as defined by “Oslo Manual” (Podręcznik Oslo 2005), four main types of innovation are distinguished: product, process, organisational, and marketing innovation. Further, when considering the significance of innovation, we can distinguish between breakthrough innovations (substantial, radical, revolutionary) and incremental innovations (small, streamlining). According to the originality criterion, we can distinguish between creative innovations (original) and imitative innovations (unoriginal, adapted) (Dawson and Andriopoulos 2014; Penc 1995; Serafin 2014; Świtalski 2004).

The source of innovation may be anything that creates specific ideas, designs and becomes the impetus behind the search for new solutions. Sources of innovations can be divided into internal and external ones. Internal sources are the most valuable – they are the cheapest, and their benefits are wide-ranging and cumulative

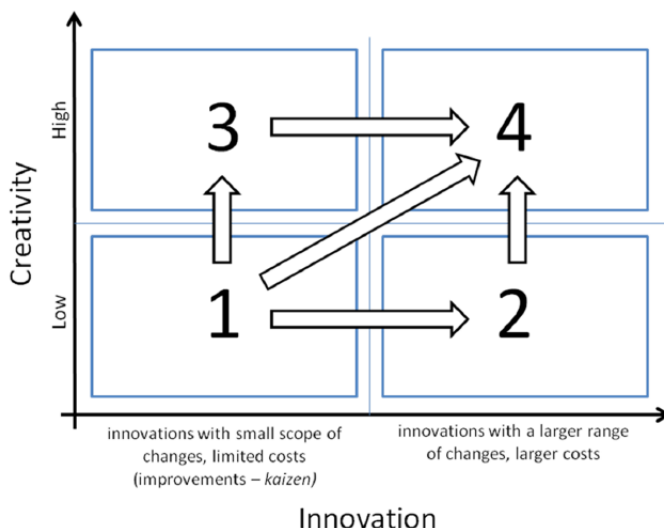
since even minor improvements yield synergy effects when aggregated. They have tremendous motivational value since they allow people to grow. Internal sources of company innovation include employees, technical and managerial personnel, research results and technical facilities, quality circles, and *kaizen* teams (Penc 1999; Serafin 2014).

The innovativeness of companies is influenced by so-called innovation capability, understood as the company's ability to generate, accept and implement new ideas, processes, products or services. It depends to a large extent upon people employed in the organisation, organisational culture, leadership, and internal regulations which either foster or hinder the development of innovation (Barsh et al. 2008; Calantone et al. 2002; Loewe and Dominiquini 2006; Pietroń-Pyszczyk and Piwowar-Sulej 2013; Szczepańska-Woszczyzna 2015; Wang, Dass 2017).

The issue of innovation is strictly related to the notion of creativity. This notion also escapes any attempts to clearly define it (Parkhurst 1999; Ford and Harris 1992). According to Dawson and Andriopoulos (2014: 64-65), if innovation is understood as a process of using new ideas and transforming them into new products, services and solutions, then creativity should be understood as the source of new (innovative) and useful ideas. From this perspective, creativity is the beginning and the cause of various forms of innovation.

Demonstratively, the relationship between innovation and creativity may be presented as in Figure 1.

Figure 1. The relationship between innovation and creativity



Source: Own elaboration.

The x-axis (innovation) presents – as the effect of innovativeness – innovations distinguished according to the criterion of the scope of changes and “costs”: innovations with a small scope of changes that do not require great costs (improvements) and innovations with a larger range of changes that require larger expenditures. The y-axis (creativity) distinguishes low and high levels (degrees) of creativity. The desired state is high creativity, which is favourable to minor improvements (3) and innovations with a larger range of changes (4). Thus, the following questions arise: How to cross from square 1 to 3 (increase creativity regarding improvements) and from square 1 to 2 (how to integrate improvements with innovations under conditions of relatively low creativity)? Can growth in creativity be an accelerator for innovation with a larger range of changes (“direct” transition from square 1 to 4, or passing through square 2 or 3 to reach square 4)? What affects innovation and creativity in companies, and how are these phenomena related?

2. Conditions for innovation and creativity

2.1. Conditions for innovation

Using the innovation model proposed by Birchall and Armstrong (2001), the following conditions for innovation can be presented: the external environment (information on new technologies and organisational solutions originating from the company’s environment, information on the needs and expectations of the environment e.g. customers, contractors); the internal environment (company’s strategy, technologies used, award system, teamwork); the innovation process (management of the innovation process, procedures, styles of employee-innovator leadership); and development management (organisational learning capacity).

Internal factors create the innovative potential of the company, which significantly influences the sizes and effects of innovation. Although the scope of the possibility to influence innovation activities in companies varies depending on external condi-

tions, this activity is insofar significantly determined by factors dependent on the company (Baruk 2001; Zych 2016). The key internal conditions of innovation include managerial support for creative employee initiatives, visionary leadership, supportive organisational culture, the desire to engage in the innovation process, teamwork, readiness for learning and adapting solutions, and effective communication (Loewe and Dominiquini 2006; Souza and Bruno-Faria 2013; Tidd et al. 2001; West 2000).

Research into the ideal conditions for innovation often emphasises the considerable role of managers, whose attitude and management style strongly determine the capacity for building an innovative company. It is also crucial for them to have leadership skills relevant to the development of innovation (Bolivar-Ramos et al. 2011; Dawson and Andriopoulos 2014; Jung 2001; Szczepańska-Woszczyna 2015; Tidd et al. 1997). Managers must be aware of the value of innovation and must be able to involve their team of employees in its creation, implementation and development. Their task is to create a learning organisation and shape a culture which fosters innovation, which is also strongly stressed in the subject literature (Ahmed 1998; Bolivar-Ramos et al. 2011; Fabrowska 2010; Szczepańska-Woszczyna 2014). According to research conducted among high-level managers by McKinsey Quarterly, more than 70% of people indicated that innovation is one of the three most important factors for the development of their companies. At the same time, nearly 65% of managers stated that their skills in the field of supporting innovation are inadequate and require development (Barsh et al. 2008).

The importance of the conditions mentioned above is also indicated by the results of research into factors which inhibit innovation. The most frequently indicated

factors hindering innovation were management not paying due attention to innovation, lack of managerial involvement, shortage of managerial competencies, lack of appropriate qualifications of operating personnel, lack of employee motivation, improper rewarding of innovators for their achievements, lack of a favourable organisational culture, a weak information system, lack of independence of innovators' activities, and mental barriers (Kalinowski 2010; Souza and Bruno-Faria 2013; Zych 2016).

According to Penc (2006), most Polish companies experience the phenomenon of innovation inertia, consisting of inactivity and aversion to undertaking innovative activities. The sources of innovation inertia may be found in the following factors: personal characteristics (excessive self-confidence, low need for self-fulfilment, low openness to changes, inability to take risk); structural features (lack of a "climate" for innovation); and demographic and professional features (age of employees – elderly people are more inclined to have reservations and display inertial behaviours; job seniority – extended work experience fosters routine and stabilisation; qualifications – poor qualifications lead to inactivity and routine behaviours) (Serafin 2014).

2.2. Conditions for creativity

Conditions for creativity in an organisation may be presented by the 4P formula: People – employees, Process – the process of creativity, Pressure – the environment and conditions for the creation process, Product (service) – perceived as the result of creativity (Wiśniewska and Janasz 2012). Another important factor for creativity is the demand for a new solution ("necessity is the mother of invention"). People are always the creators of new ideas. The level of creativity of each person depends on two basic variables: individual personal features and skills, as well as external stim-

uli and conditions created by the environment (Niedzielski and Rychlik 2006). In the opinion of West (2000), personality traits which encourage creativity include persistence, the need for autonomy, focus on risk, independent thought and assessment.

Deliberations over creativity strongly emphasise the meaning of factors affecting a person from the outside, assigning even bigger significance to them than to internal conditions. Many studies focus on factors which stimulate and inhibit creative behaviours (Amabile 1997; Hughes 1998; Parnes 1997; Niedzielski and Rychlik 2006). This primarily concerns the identification of factors that affect the correct course of particular stages of the creative problem-solving process. Considerable attention is paid to the climate and atmosphere at work. The creation of an atmosphere supporting creativity – a climate for creativity – is suggested (Amabile 1996; Deschamps 2014; Ekvall 1996; Karwowski 2009; Parnes 1997; Subramaniam 2012; Thomas 2009; Trias de Bes and Kotler 2013).

Parnes (1997) mentions four primary factors that should be supported in an organisation to enable a creative approach to problem solving: restraint from judgments, freedom of action, generating many ideas, and developing the ideas of others. Amabile (1997) also identifies six factors relating to the work environment that are supposed to stimulate creativity. These include supporting organisational culture, the support of management, the support of the team, sufficient resources (materials, work conditions, information), specific challenges, and freedom (autonomy).

When considering the aspect of motivation, creativity is helped by encouraging employees to submit various ideas, creating an atmosphere of cooperation in the group, fostering discussion and sharing information, using awards for creative attitudes, and ensuring a friendly atmosphere

at the workplace (Wiśniewska and Janasz 2012).

Equally importantly, factors which hinder creativity include the negative attitude of employees and teams (focusing on the undesirable aspects of problems, e.g. looking for someone to blame instead of looking for solutions), fear of failure or being ridiculed, lack of time for thinking (excessive workload), lack of creative freedom, making wrong assumptions (focusing on stereotypes and prejudices), and focusing on dry logic without considering intuition (Amabile 1997; Thomas 2009).

Since creativity can be “realised” in the innovation process (it is an unavoidable relationship), everything that serves or limits creativity may also indirectly affect the level of innovation. Therefore, the conditions for innovation and creativity are to a large extent shared, as presented above.

3. Innovation and creativity in the Lean Management environment

In the opinion of Thomas (2009), creativity requires questioning the *status quo* and continuously searching for better solutions, because:

- no action is good only because we do it,
- no method is good only because we use it,
- no device is good only because we have it.

This approach is embraced by the concept of Lean Management, one of the rules of which is continuous improvement. The essence of Lean Management is the reduction of any wastage (Jap. *muda*), namely actions that absorb resources rather than add value. The purpose of LM is to optimise the functioning of the company and raise its effectiveness. These goals are achieved through the introduction of process, product, organisational,

economic, and technical innovations, and thus the concept covers the organisation in each aspect of its functioning. From the viewpoint of operational efficiency, the essence of LM is to produce more using less (human effort, surface area, resources, and so on).

Lean Management is based on the *kaizen* philosophy, which recommends systematic, small improvements in all areas of functioning of the company and greatly emphasises activities in the scope of *problem solving*. A fundamental issue is not to seek people to blame for the situation (this blocks innovative thinking) but to seek solutions to problems. It is crucial to have an organisational culture fostering *kaizen* (*no blame culture*). All members of the organisation should be involved in continuous improvement activities, regardless of their position. So, how does the phenomenon of innovation and creativity “fit” in the Lean environment?

We may encounter an opinion that Lean, due to standardisation, limits creativity. However, the standards on which Lean is based should be subject to continuous innovations – they are merely the best way to carry out certain tasks in a given time, serving as a reference for future innovations (Miller et al. 2014).

Miller et al. (2014) believe that it is a mistake to assume a dichotomy between *kaizen* and innovation. In their opinion, there is evidence to prove that order and harmony foster innovation – the *kaizen* culture does not stifle innovation, but rather enables it. In the opinion of the authors, Lean fosters innovations by pursuing the assumptions of the concept: restraining from overproduction, listening to the customer and introducing relevant changes, getting to the sources of problems, and drawing conclusions from small experiments (including unsuccessful ones). Lean can thus bring innovation processes to a new level, where

they will become a true distinguishing mark of competitive advantage (Sehested and Sonnerberg 2011). The research conducted shows how different Lean tools, i.e. 5S, VSM, standard work and visualisations, foster the individual creativity and innovativeness of employees (Lindskog et al. 2017).

The literature studies presented show that mutual relations between innovation and creativity exist, the conditions for the development of innovation and creativity in companies are similar, and the Lean environment should support the phenomena of creativity and innovation. However, the question arises as to whether these conditions and interrelations between innovation and creativity are used at a satisfactory level in practice, and whether they yield satisfactory results. The initial examination of these issues is pursued through case studies undertaken for these purposes.

4. Innovation and creativity in the Lean environment – case studies

The purpose of the empirical studies conducted with the use of the *case study* technique was to perform a preliminary identification of the conditions for innovation and creativity of companies operating in the Lean environment. The study covered two production enterprises, advanced in terms of the implementation of the Lean Management concept, the first of which (A) represents the automotive industry, while the second one (B) represents the food industry. The respondents were highly qualified senior managers, experienced in dealing with LM. Concerning issues vital to the topic of the study, an attempt was made to maintain the original form of the responses. Both companies belong to international enterprises and are located in Poland.

The first issue analysed concerned the scope and the organisational (structural) location of innovation activities. At company A, we can distinguish product innovations (implemented by the Engineering department - E), process innovations (Engineering department, Process Optimisation department - PO, Continuous Improvement department - CI) and organisational innovations (CI, PO departments). The Engineering department operates beyond the plant's structures. It is a technology centre covering the entire corporation. The Process Optimisation department and the Continuous Improvement department report to the plant's director. At company B, innovations are considered in two groups (categories). Small innovations that can be implemented quickly and at limited cost belong to the scope of responsibility of the CI department (Continuous Improvement). These are minor improvements in the organisation of production and work respectively. Innovations with a broader range of changes, particularly requiring funding of more than EUR 1000, are implemented by the BD (Business Development) department and the engineering department subordinate to it. The CI department deals with registration and testing efficiency and financial results of the reported improvements, and conducts training in LM as well. The CI department conforms to the internal structure of the factory, and its role is focused mainly on the analytical and advisory functions. The BD department that conforms to the European company structures focuses on implementing investment projects (new lines, new products, changes in the specification of products and packaging). This department has more decision-making possibilities.

Another question concerned the general scope of minor improvements ("*kaizens*") reported by employees via the system of employee suggestions and innovations

with a larger range of changes and requiring larger financing. In company A, *kaizens* do not "interfere" with the product and mainly concern the organisation of work, process, flow (internal logistics), OHS, and ergonomics. Rarely, amongst bottom-up initiatives, can one find process innovations aimed at checking whether the process takes place safely without affecting product quality. In turn, innovations with a larger scope of changes concern new products, processes and modern machines. In company B, the entire agenda of the plant's operation (including streamlining activities) is based on five key issues: safety, quality, costs, delivery, and motivation. The ideas for streamlining must fit within these frameworks. Innovation is considered to be a project for improving the results of actions in the above categories, requiring an investment of more than EUR 1000.

A question was also asked about whether, within the suggestion system, some reported solutions are qualified as innovations in terms of a broader scope of changes and what happens to them. At company A, such situations are rather non-existent. On the contrary, at company B, they do occur and are implemented according to procedure – if they require funding of more than EUR 1000, they are transferred from the CI department to the Business Development department.

Another issue concerned the main areas of cooperation between the units listed above which are involved in innovative processes. In company A, the Process Optimisation department and the Continuous Improvement department carry out joint *kaizen* and SMED workshops. At the same time, joint problem-solving through PDCA and Shinin projects is conducted by the CI, quality and PO departments. In 50% of cases, the PO department does not consult on its projects (innovations)

with the CI department. In the other 50% of cases, it conducts such a consultation (it depends on the technologist); then the CI manager is invited to meetings concerning innovation intentions. Otherwise, he learns about them ex-post. On the other hand, at company B, at the investment planning stage, practically the entire responsibility falls upon the Business Development department. Upon the project passing to the operating level, both departments (BD and CI) commence cooperation on a greater scale. This is legitimised by certain frameworks specified in the company's policy. At the implementation stage, practically the entire supervision over the current operation of a particular project is handled by the CI department.

The study also attempted to identify whether conflicts (antagonisms) arise between the units involved, and what they are related to. Such issues were observed in both companies. In company A, the boundaries between "interests" of units dealing with innovations are noticeable. The objective of the Process Optimisation department is to create a production process that would ensure the least amount of deficiencies (focus on quality); the criterion of price is also significant (it needs to be cheap). Attention is paid mostly to technological and technical issues (budget for machines). Topics related to human resources, space occupied, inventory, process management, and ergonomics are overlooked – they are the responsibility of production managers and the Continuous Improvement department. This results in the cheap starting-up of production and, conversely, expensive maintenance. Since there is no process orientation in the innovation process, everyone is accountable for his/her own work. Therefore, at the design phase (PO department), primary emphasis is placed on the implementation of the budget for the purchase of machines and equipment, and

at the production phase (CI department) on OEE ratios, headcount costs, and the costs of deficiencies. Conflicts exist also in company B and arise fairly regularly. In particular, they concern the last phase of project implementation; they arise when determining who should handle the given issue/topic – the Development department which implemented the project, or the CI department (e.g. ordering spare parts).

Another interesting issue in the study was the determination of whether CI managers affect employees with regard to "stimulating" them to be innovative and creative (submit improvements). At company A, such a possibility occurs mainly during training, workshops and audits, and less frequently during "casual" conversations at the production line. At company B, the CI manager also has little direct impact on the employee, since he/she is not this employee's direct superior. The only opportunity is to set out goals for the employee (team) when it comes to the number of reported improvements. Awards for reported improvements are allocated indirectly via points (collected points can be exchanged for an in-kind prize), or by managerial awards for the implementation of good ideas.

Another question concerned how the CI manager affects line managers with regard to the implementation and development of rationalising activities in the field he manages. At company A, this is done through weekly meetings with managers concerning a review of ideas and indicators regarding continuous improvement and the use of Lean tools. Another method is to ask for the intervention of the plant's director, or spur the ambition of managers (in order that they would then influence their subordinates). At company B, each line manager has quantitative goals determined for his team by the CI manager regarding improvements to reporting. To support those

actions, a training plan is created and implemented on an annual basis, allowing for the delivery of appropriate knowledge of *kaizen* to the team.

Another issue examined was the role of line managers in shaping the environment for innovation and creativity. At company A, this depends on the priorities of top management, the particular person, the management method, the process stability, and the team. Managers make many improvements without documenting them (showing them off). In general, it is the task of direct superiors (leaders) to stimulate creativity and gather ideas. They should encourage employees to submit ideas and directly engage in continuous improvement, but the successful completion of the production plan often takes priority. At company B, managers assume various attitudes (highly rational, in the opinion of the respondent). If the manager sees the need to develop in this respect, he is usually motivated and involved in the activity. He gladly supports the team, organises training sessions, provides time for team meetings, and organises funding. On the other hand, if such actions are feigned (e.g. goals imposed by the corporation), they are strongly resisted. Some activities may even be torpedoed by managers. Line managers are to be the leaders of this activity regarding training and supplying necessary knowledge, and ideas are supposed to come from the operations level.

A question was also asked on how the organisational culture supports and limits innovation and creativity. Company A has no clearly articulated values and standards which help to foster innovation and creativity. The attitudes and actions are different, depending on people and relationships. The plant has numerous older employees who have already experienced multiple changes within this company, are poorly involved in general, and do not see

many personal benefits of this type of activity. Key elements of the culture of company B are commitment to achieving outstanding results, acting to inspire others with one's attitude, and striving to improve. The company works under an integrated management system, so it has all the tools necessary to build a culture of continuous improvement. People who are involved in this activity are preferred for promotion. Quantitative and qualitative monitoring is conducted on a rolling basis with regard to reported improvements, design problems solved, and so on. On the basis of the information gathered, conclusions are drawn and remedial actions are taken.

The question of whether the mission and the strategy of the company refer to the category of creativity and innovation at company B received affirmative answers. At company A, there are clearly defined financial criteria in this respect (projects for a given year should yield an appropriate return at the level of several million PLN/year). They are described in terms of Hoshin Kanri, and progress is monitored every month.

The next issue examined concerned the motivating tools used for stimulating innovation and creativity. At company A, the main motivating factor for employees is the financial incentive – a specific amount paid for three ideas. In the opinion of employees, it is a weak incentive. For extraordinary achievements, the managing director can award special prizes, i.e., an appreciation bonus or an award at the end of the year for technologists (larger amounts for process innovation). Motivational programs at company B involve collecting points for ideas (exchanged for in-kind prizes), or cash prizes for *kaizen* of the month, quarter, and year. Activity concerning improvements is also given priority when it comes to promotions.

The question of whether training is conducted for the development of innovation and creativity was also asked - and if so, what form it takes. Company A offers little to no such training. Training plans are determined each time by mid-level and top management. At company B, basic induction training is conducted by the CI department, and covers all employees. More specialised courses (5Why, Problem Solving, SMED, A3, ...) are also offered and conducted relatively regularly. Extended training, e.g. the organisation of workshops, is offered for a narrower group of people as indicated by the line leader.

Another issue examined was the application of specialist management tools and organisational solutions which "stimulate" innovation and creativity. At company A, these included an employee suggestion system, shop floor management, *kaizen* workshops, and Shinin projects. Likewise, at company B they covered an employee suggestion system, shop floor management, A3 reports, and *kaizen* workshops.

The study also tried to examine the issue of the scope and the method of connecting (harmonising) innovative activities with a broader scope (top-down) with activities with a smaller range (bottom-up improvements). In company A, many ideas originate from the bottom, including those concerning a broader range of changes. However, the problem is that operators are not always able to articulate problems and suggestions for changes. It is thus essential to have a communication system between the operator and the leader, as well as the leader and the top manager. The use of *shop floor management* also allows for direct meetings and conversations with management (including the top levels of management) - the employees are then more willing to be open. It is also important to include operators in solving problems: e.g. through *problem solving* workshops.

The collected ideas (suggestions) are transferred higher up and, during global meetings, under individual functions or levels of management, possible development and implementation are discussed. Unfortunately, this requires a significant amount of time, and requires multilevel approval. At company B, a respondent expressed the view that such activities should be coordinated by one entity within the structure, e.g. the CI Manager. Currently, each department (CI and DB) "pulls for itself a bit", which results in the fact that some activities are not performed smoothly or are even abandoned due to the lack of coordination and cooperation.

The study also searched for an answer to the question of the circumstances under which innovations can be more, and less, creative respectively. The respondent from company A stated that innovations are more creative when the employee is given "free rein", does not feel constrained by the organisation (the management), and, at the same time, is motivated and listened to by the management. They are less creative when innovation tasks are imposed (e.g. an imposed quantity of ideas submitted - a monthly goal). Similarly, at company B, it was observed that if innovations concern the actual needs of the line/area, then they are more creative. If they concern goals imposed (or these objectives were not accordingly communicated to the team), they are less creative.

The study also identified difficulties related to shaping creativity. According to the opinion of company A, the organisational culture is an important element that weakens or reinforces creativity. Employees very often believe that improvement is not their responsibility, which in their opinion rests with the management personnel. Another important element is the system for rewarding creativity. Employees usually expect cash prizes commensurate

to the proposed savings. Creativity is also affected by delegating and the scope of responsibility. Firmly embedded standards also support creativity. Most employees belong to the so-called “older” group of personnel (more than 20 years of job seniority), and it is hard to stimulate creativity in this group. Employees have previous bad experiences with activities of this type (e.g. managers did not read submissions concerning improvements). This has now changed for the better with the establishment of a special commission to examine suggestions for improvement, composed of engineering, OHS, maintenance, and CI managers. Company B mentioned the following difficulties related to shaping creativity: the labour market (high turnover), weak organisational structures (long waiting time for implementation of tasks), lack of funds, and poor knowledge.

The final issue examined was the question of when (and with which characteristics) Lean Management fosters innovation and creativity, and when it does not. Company A indicated that favourable circumstances could arise from conducting workshops (in interdisciplinary teams) to solve various problems, and a well-functioning system of suggestions where the opinion of each employee is taken into consideration. On the other hand, the fact that it is based on limiting standards and hampering operations as well as turning away from improvements was deemed to be an adverse feature of the concept. Another problematic issue is a situation in which standards themselves become the most important thing in the organisation. This applies particularly to corporations, which have “their own” production system and “demand” observance of standards, even if they do not add value. It is also a trap to blindly implement tools and methods by “copying and pasting” the tools and methods of other organisations. Company B indicated the following

circumstances which encourage creativity: the empowerment of managers and line employees, as well as greater autonomy when making decisions at lower levels of the organisation. When it comes to adverse factors, the organisation of activities plays a critical role. Even in the case of a high-quality organisational culture within the company, individual units or departments function differently in this respect. Without supervision and carrying out control activities at the global level, the system will not function correctly. Additionally, the company indicated the superficial character of actions resulting from corporate requirements or the need to fulfil audit requirements as a key barrier to progress in this field.

Conclusions

This paper’s attempt to undertake an initial identification of the conditions of innovation and creativity processes in companies and their mutual coordination, with a particular focus on the conditions pertaining to the management system and the LM concept, confirmed the significant interest in this field among researchers both in Poland and abroad. Many studies and publications devoted to the examination of the phenomena of innovation and/or creativity (separately or jointly) and the conditions thereof provide fairly rich, albeit dispersed, knowledge in this field. Literature sources also allow for the expression of the view that the coexistence of innovation and creativity is fostered by the Lean environment, although it is not free of constraints in this respect. The survey-based source study (*case study*) devoted to this problem, which we conducted in two companies with foreign capital operating in Poland and experienced in the use of the Lean Management concept, led to the following conclusions:

- both companies examined feature organisational separation of innovative projects with both a smaller and a

- larger range of changes (and costs);
 - this results in conflicts related to the lack of synchronisation of goals and the lack of responsibility for specific actions ("everyone pulls for themselves");
 - the organisational separation of activities results in the lack of liquidity of innovation activities (long, multistage process) or their abandonment due to the lack of coordination and cooperation;
 - at both companies, the task of line managers is to shape the environment for innovation and creativity. In practice, one limitation is the pressure to implement the plan, as well as the top-down imposition of innovative projects;
 - in the opinion of the respondents, financial incentives are an important motivating factor for creative innovation activities. However, at one of the companies, this is inadequate for the solutions proposed;
 - both companies use specialised (Lean) management tools and organisational solutions which stimulate innovation and creativity, i.e., shop floor management, an employee suggestion system, kaizen workshops, and A3 reports;
 - according to the respondents, innovations are more creative when the employee is given "free rein" and is listened to by managers, as well as when innovations concern the actual needs of the production area/line;
 - obstacles to shaping creativity include poor financial motivation, lack of creative freedom, strongly embedded standards, as well as bad experiences of employees (A), high rotation, long waiting time for the implementation of tasks, lack of funds, and poor levels of knowledge (B);
 - LM elements which foster innovation and creativity include workshops in interdisciplinary teams (problem-solving), a well-functioning system of suggestions, and the validation of line managers and employees (greater decision-making autonomy),
 - on the other hand, adverse LM elements include standards which limit and hamper activities (turning the prevailing way of thinking away from improvements), assigning priority to standards, lack of central coordination of activities, the superficial character of activities arising from corporate requirements or the need to fulfil audit requirements.
- In conclusion, awareness of the needs, conditions and mutual relationships of the examined phenomena and processes (innovation, creativity) on the part of managers of enterprises is relatively high, and does not differ substantially from theoretical patterns. The practical functioning of the companies examined, which are "advanced" with regard to the application of LM, contains certain elements of solutions which intentionally support innovation and creativity. However, we cannot speak of the existence of systems for such support, let alone their efficient functioning. In the cases examined, the need for cooperation and integration activities in the area of innovation and creativity was recognised, but some difficulties in establishing and sustaining it were clearly visible at the same time. Hence, we suggest greater attention paid to ensuring better cooperation and coordination of activities in both areas (innovation and creativity).

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