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INDIVIDUAL INNOVATIONS

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Purpose: The aim of the paper is to analyze the individual innovation processes in industrial enterprise.
Design/methodology/approach: Critical literature analysis. Analysis of international literature from main databases and polish literature and legal acts connecting with researched topic.
Findings: The publication concentrate on problems connected with various aspects of individual innovations. In the paper we presented the analysis of differences between terms – innovation, reform and change and its impact on industrial management. Also we analyzed in detailed way the main trends in management in the context on their impact on individual innovations. We analyzed the activities organization should use to boast the innovativeness level in the enterprise. The innovativeness can be done in centralized or decentralized way. This is an important factor influencing the results of innovations activity. We try to analyze the situation of strong centralization of R&D activities in a company with an analysis of its advantages and disadvantages. We think that the decentralization of R&D give the company possibility to easy identify market opportunities and treats and because of that it can easy adapt new product and processes to the customer requirements.
Originality/value: Detailed analysis of all subjects related to the problems connected with individual innovation in an industrial enterprise.

Keywords: Industry 4.0; innovation, industrial enterprise, individual innovation, research and development.

Category of the paper: literature review.

1. Introduction

The issues of innovation are very important for the modern economy. Basic concepts of innovation can be defined as follows (Wolniak, 2016; Czerwińska-Lubszczyk et al., 2022; Drozd, Wolniak, 2021):

- Innovation - the result of creative activity, aimed at introducing changes in the system of the organization concerning products, processes or management which meet the needs of the organization and brings benefits in terms of growth, profits and prestige.

- Innovative activities - the whole of the organization's activities focused on the development and implementation of the necessary and beneficial innovation.
- Innovation process - a process involving clarification of the needs of innovative idea generation, its design, implementation and operation.

In the literature, the most common division of innovation is as follows:

- product innovations,
- process innovations,
- service innovations.

The aim of the paper is to analyze the individual innovation processes in industrial enterprise.

2. Basic definitions

Most of the literature defines innovation as the implementation not just of new ideas, knowledge and practices, but also of improved ideas, knowledge and practices (Oslo Manual, 2005; Avvisati et al., 2013; European Ambassadors, 2009; Gajdzik, Wolniak, 2021, 2022; Gębczyńska, Wolniak, 2018; Grabowska et al., 2019, 2020, 2021). Innovation is different from reform or change, which does not necessarily mean the application of something new, nor does it imply the application of improved ideas or knowledge (Montonen, Eriksson, 2013). The competition between three concepts: innovation, reform and change (Table 1) can be very interesting. By referring to Table 1, we can say that innovation is not the same as change.

Table 1.
Innovation, reform and change

	Innovation	**Reform**	**Change**
Definition	Implementation of improved ideas, knowledge and practices	Structured and conscious process of producing change	Transformation or alteration that may be an intended or unintended phenomenon
Key characteristics	Implies novelty and brings benefits	Produces change (though in some cases only little or none)	Is historical, contextual and processual
Types	Process, product, marketing or organizational; Incremental, radical or systemic in form	Radical, incremental or systemic	Differentiated by pace (continuous or episodic) and scope (convergent or radical)

Source: (Oslo Manual, 2005).

These types can be defined as follows (Oslo Manual, 2005):

- Product innovation is the launch of the product when the technological characteristics or intended use differs significantly from previously manufactured products or the operation of which has been substantially improved, and at the same time it can provide the consumer with objectively new or increased benefits.

- Process innovation is the adoption of new or significantly improved methods of manufacturing or delivery of products. This might involve changes in the organization, technology, human resources, working methods, hardware, or a combination of such changes.
- Service innovation is the launch of a service which is new or is perceived by someone as new. It is therefore a service which offers consumers a new benefit or value. Such innovation is the change of an existing service or proposes a new one. Innovation in services is defined by multiple divisions including product innovation.

Although innovative processes benefit from collaboration (see next chapter of this book), new knowledge in real-life networks can begin with an individual. Individual perspective to innovation is underrepresented in research (Peschl et al., 2014; Standing et al., 2016; Mulder, 2012; Habek, Wolniak, 2013, 2016; Hys, Wolniak, 2018). The competences needed in innovation processes can refer to knowledge, skills and attitudes, but the influence of an individual characteristic on it also seems to be significant (Sturing et al., 2011).

3. Trends in management with impact on individual innovations

Employees are a knowledge resource for their employing organizations. In many areas of management, they should have realized that the human element of organizational development is connected with the innovative capability of an organization (Jonek-Kowalska, Wolniak, 2021, 2022; Jonek-Kowalska et al., 2022; Kordel, Wolniak, 2021). To recipe a success on the market an organization is claimed to be focused on a creative and innovative workforce (Amo, 2005).

We can find in the literature conception of individual innovation competence. It can be understood as a synonym to the set of personal characteristics, knowledge, skills or abilities that are connected to creating concretised and implemented novelties via collaboration in complex innovation processes. Similar to other competences, innovation competence can be learned and developed (Hero et al., 2017; Kwiotkowska et al., 2021, 2022; Orzeł, Wolniak, 2021, 2022; Ponomarenko et al., 2016; Stawiarska et al., 2020, 2021; Stecuła, Wolniak, 2022; Olkiewicz et al., 2021).

The growth of importance of individual innovative behavior in the organization is due to current trends in the management sciences. In table 2 we presented the main trends which have an impact on individual innovations in organizations.

Table 2.
Trends in management with impact on individual innovations

Trend	Characteristic
Dynamicity and turbulence	Market arenas are getting more and more turbulent and dynamic: customer needs, competitors, business models and the set of competencies necessary to compete in a definite industry change over time with a frequency much higher than ever.
Globalization of markets and business activities	Globalization has fostered homogeneity in customer needs but, at the same time, has renewed companies' interest toward the satisfaction of local demand
Increased competition	Globalization, liberalization and convergence of markets and technologies have increased competition in several industries, both at a domestic and at a global level
Rapid advances in technology	New knowledge is developed and applied to products and services faster and faster. Consequently, life-cycles are shortening in some product categories, a greater number of new products and services are being introduced over time, and the time between subsequent innovations is decreasing.
End of the linear model of innovation	Traditionally, technological innovation was conceived as a sequential process that linearly proceeded from idea generation, through development, prototyping and testing, manufacturing and market launch. The input of this process was either a technology advancement (the technology push approach), the identification of a market need (the market pull approach), or a combination of the two (the interactive or coupling model). This point of view has radically changed in the last decades; technological innovation has become a flexible, iterative process, contemporarily involving R&D and other functions, characterized by a strong participation of both suppliers and lead users and by a systemic nature.
Increased reliance upon external sources of technology	Firms generally lack the financial and technical resources to build the whole range of competencies they need and hence move towards a higher level of technical specialization, concentrating internal R&D efforts on core activities where they are more likely to excel. Contemporarily, they rely strongly on external sources of technology to access the other required competencies and to feed their innovation pipeline with higher frequency and continuity.
Leverage on multiple channels for technology exploitation	Traditionally, firms have exploited innovations, incorporating them into products or services that were internally developed and launched in the final market. Nevertheless, the costs required to develop new technologies and the speed at which new knowledge is developed make sustainable long-term growth even more dependent on the continual and full leverage of a company's technology basis. Therefore, firms are contemporarily using multiple channels for converting their technologies into incomes, among which external exploitation paths (such as patent sale or licensing out, new venture spin-off or contract research) are used more and more.
The entrepreneurial nature of R&D	Traditionally, R&D was considered part of the firm's overhead costs and conceived as a technology-led unit where all innovation opportunities were generated and developed until ready to be released to manufacturing and marketing. Nowadays, internal R&D becomes the repository of the firm's core technological competencies but, at the same time, it is the engine of the innovation process and performs critical brokering functions, such as the scouting of the external environment for the identification of valuable sources of knowledge and the integration of internally generated with externally acquired technologies.
Birth and growth of markets for technology	The search for multiple channels for commercializing the output of firms' innovative efforts, the specialization in knowledge production and the related division of labor within innovative activities have brought the birth of so-called markets for technology. The capability to interact with these markets for technology has become a further critical determinant of most successful firms' innovative behavior.
Management of R&D and innovation on an international scale	Finally, the management of technological innovation has assumed a prominent international dimension. In fact, studies of the internationalization of innovation processes indisputably show that foreign R&D is becoming a significant component of many countries' R&D base

Source: On basis (Ortt, Verburg, 2008; Ortt, Smith, 2006; Jones, Teegen, 2002).

Some research suggests that obtaining conventional rewards play a very small role in stimulating innovativeness. The participation itself is a sufficient reward for conducting an innovative behavior of peoples (Sułkowski, Wolniak, 2015, 2016, 2018; Wolniak, Skotnicka-Zasadzień, 2008, 2010, 2014, 2018, 2019, 2022; Wolniak, 2011, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021, 2022). Also, it is worth mentioning that when employees perceive that efforts are fairly rewarded by the organization, they are willing to cope innovatively with higher levels of demand in the work environment (Amo, 2005). According to literature we can define innovative behavior as a complex process consisting of generating, promoting and implementing ideas that are novel and useful within a particular social context (Yuan, Woodman, 2010; Wolniak, Sułkowski, 2015, 2016; Wolniak, Grebski, 2018; Wolniak et al., 2019, 2020; Wolniak, Habek, 2015, 2016; Wolniak, Skotnicka, 2011).

Organizations can take many activities towards enhancing the innovative potential among their workers. Especially organization which is adjusted to innovative people enhancement should follow points like (Ortt, Verburg, 2008):

- the organization for external innovation,
- the coexistence of innovating and operating organizations within the firm's overall structure,
- the organizational decentralization of innovative activities,
- the organizational separation between research and development activities,
- the resource allocation mechanism in the organization for innovation.

Spite of several action could be used to spur innovation at the organizational level, including (Srobl et al., 2020):

- leadership,
- creative work environment,
- organizational culture,
- organizational climate.

The social network a particular person exists has an important impact on the innovative behavior of this person. Social networks characterized by weaker relationships are an important determinant of creativity. The weaker ties an individual has, the better it would be for his creative outcomes. The intermediate level of weak ties was positively related to creativity when the employees' conformity value was low (Wolniak, Jonek-Kowalska, 2021; 2022). Also, a more central position of an individual in respect to the others is associated with creativity, because such a position provides an individual with higher social status. Because of that the social network can provide an individual actor with opportunities for exhibiting innovative actions (Nedkovski, Guerci, 2015).

Another very important factor influencing individual innovative behavior is work motivation. It plays a critical role in organizational behavior because it determines the quality and extent to which the employees would engage into the working activities. In the case of

intrinsic qualities self-determination and sense of competence at work are feelings that give rise to people's intrinsic motivation. When an individual is enjoying a high level of intrinsic motivation, his interest and involvement in the job task rises to a level that can provide him with a sense of merging with his working activity and higher level of innovativeness (Nedkovski, Guerci, 2015).

Innovativeness is also enhanced by personal values of the particular person. Some studies show the relation between personal values and creativity and innovative behavior (Sousa, Coelho, 2013). The natural way to pursue important values is to behave in ways that express them or promote.

Therefore, we can expect that some values can be useful to foster innovative behavior in employees and others to be negatively related to. The very important value from an innovative point of view is openness to change which comprises self-direction and stimulation. Self-direction has been argued to be a value that is the most important for creativity. The motivational goal of self-direction involves independence in thought and action, self-direction can be reflected through exploration and free choice which are perceived to be crucial for creative individuals. In the case of situations when employees ranked low on openness to change they were less creative (Pure, Lagun, 2019).

Other, conservative values like: conformity, security and traditions seem to have a negative effect on employees' innovativeness (Schwartz, 1992). Such values predispose individuals to attempt customary behavior and establish procedures and ideas which are undoubtedly not conducive to innovativeness. Because the goal of conformity is to restrain actions, inclinations and impulses to avoid upsetting social norms, employees who attribute high importance to this value may avoid undertaking innovative initiatives because it is not easily welcome for others within the organization (Purc, Lagun, 2019).

There are two ways of enhancing the innovative attitude among people. We can use a totally centralized approach or totally decentralized approach. In the case of strong centralization R&D activity is undertaken at the corporate level, with a single top manager in charge of the organization. In the case of decentralization R&D gives the opportunity to easily identify market opportunities and threats to efficiently adapt new products and processes to requirements of the various businesses in which the organization operates. This solution also simplifies the transfer of the outcomes of R&D activities to manufacturing and marketing. In table 3 we tried to compare differences between enhancing innovation among people in the case of strong decentralization of R&D activities.

Table 3.
Strong decentralization of R&D activities

Advantages	Disadvantages
Possibility of scouting and identifying market needs, opportunities and threats	Risk of under-investment in developing core technological competences and bounded innovation
Possibility of adapting new products and processes to specific business requirements	Risk of losing the capability to synthesis and integrate knowledge from different sources and technical domains
Simple transfer from R to D	Risk of delaying investments into promising technologies not yet exploited or exploitable at the business level
Simple transfer from R&D to manufacturing and marketing	Problems in supporting radical innovation programs within certain and delayed outputs
Possibility of measuring R&D performance more simply	Problems in building a long-term vision in technology strategy
Great emphasis on development time, costs and quality	Difficulties in leveraging a common technology basis across different business

Source: (Ortt, Verburg, 2008).

4. Conclusion

The publication concentrate on problems connected with various aspects of individual innovations. In the paper we presented the analysis of differences between terms – innovation, reform and change and its impact on industrial management. Also we analyzed in detailed way the main trends in management in the context on their impact on individual innovations. We analyzed the activities organization should use to boast the innovativeness level in the enterprise. The innovativeness can be done in centralized or decentralized way. This is an important factor influencing the results of innovations activity. We try to analyze the situation of strong centralization of R&D activities in a company with an analysis of its advantages and disadvantages. We think that the decentralization of R&D give the company possibility to easy identify market opportunities and treats and because of that it can easy adapt new product and processes to the customer requirements.

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