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VOLATILITY ACCOUNTING IN MANAGEMENT OF LABOR QUALITY IN INDUSTRIAL ENTERPRISES

Dmitriy Yu. Yasinskiy (a)*, Oleg A. Zatepyakin (b), Boris S. Burykhin (c)
*Corresponding author

(a) Siberian State Industrial University, 42, Kirova Str., Novokuznetsk, Russia, yasdmitur@yandex.ru
(b) Siberian State Industrial University, 42, Kirova Str., Novokuznetsk, Russia, olegzatepyakin@yandex.ru
(c) National Research Tomsk State University, 36, Lenin Ave., Tomsk, Russia, bburykhin@mail.ru

Abstract

In the authors consider the content of the mechanism for the management of the quality of the labor force, taking into account its volatility. According to the IDEF0 methodology, it is revealed that the mechanism is nothing more than the resource support of the process, or its material part, including a set of elements that are interconnected, which are programmed for the features of the functional implementation of the process. The authors offer the definitions of such concepts as: "competence", "quality of labor force", "volatility of quality of labor power", "devolatization of the quality of labor force", "socio-economic mechanism", "mechanism for the management of the quality of labor force". According to theoretical propositions, economic and mathematical formalizations of the management of labor force quality was developed and presented taking into account its volatility, the value of devolatilization of the quality of labor force and the level position of the quality of labor force, determined using the scale of technical, business (innovative) development of industrial enterprises. Based on the analysis, the authors conclude that, for the purpose of functioning, the mechanism for the management of the quality of labor force, taking into account its volatility in industrial enterprises, should include the necessary tools making it possible to use the relevant competence resources. It is concluded that the mechanism being studied seems to be the total controllable competence resource of the process itself.

Keywords: Competence, quality of labor force, volatility.

1. Introduction

In modern conditions, industrial enterprises (as a management apparatus that forms a control system) comprise the complex content of technological and business processes. This establishes high requirements for the quality of personnel's abilities for work – for their labor force and necessitates the management of their quality. In its turn, personnel (managed system) are a complex social institution. It includes separate organizational labor groups of employees. Industrial enterprise and personnel are two complex heterogeneous systems, the interaction of which leads to the emergence of technical and social conflicts that affect social and economic activities. This feature indicates the need for detailing the objective content of a single individual, which embodies personal ability to work – labor force that takes into account professional, qualification and personal competency components in the process of personnel management of industrial enterprises, which leads to the possibility of processing and analysis of digital information on the state and changing existing sets of individuals competencies coming from a data source located in the information space of labor market, thus ensuring an effective control action on the control object (staff).

2. Problem Statement

The unauthorized, or chaotic, irregular change that affects the weight indicator of the content of a set of human competences in the process of labor leads to a violation of the integrity of homogeneous elements (competencies) in the aggregate, caused by volatility. On this basis, the process of the management of the quality of labor force becomes problematic or difficult due to the emerging informational distortion coming from the incoming environmental parameters affecting the control system. Management tools and methods lose the established degree of adequacy and the managed system responds to the corresponding impact with a deviation from the target performance indicator. Therefore, corrective actions should be launched that are implemented in the process of devolatilization, which is ensured by the functioning of the quality management mechanism of labor force, taking into account its volatility.

3. Research Questions

The management of the quality of labor force, taking into account its volatility in industrial enterprises, is a part of the general labor economy, which considers the problems of the quality of labor force, training, the formation of professional competencies, retraining and advanced training of personnel, the formation of competitiveness of staff, professional orientation of population and staff mobility.

4. Purpose of the Study

The purpose of the research is the implementation of accounting of volatility in the management of labor quality in industrial enterprises.

5. Research Methods

By the quality of the workforce, the authors propose to understand the individual set of competences of a person, determined by the level of professional qualification for the activity and the state that motivates

him to perform the required labor functions necessary for the successful fulfillment of his professional duties, and the set itself is formed from the total competency of specific content , ∑KP, ∑KPR, ∑KQ – personal, professional and qualification, respectively (Kuropatkina, 2019; Latysheva, 2019; Rofe, 2018; Shubenkova & Stryukova, 2019).

Competence is the ability of an individual to make decisions, as well as the desire for a certain type of activity, which forms his ability to implement knowledge and skills for the implementation of effective labor actions in a specific professional environment (Boyatzis, 1982; Cheetham & Chivers, 1996; Delamare Le Deist & Winterton, 2005; White, 1959).

The volatility of the quality of labor force in the context of the competency-based approach is the dynamic change in the values of the set of competencies of an individual, taking into account the impact of external and internal factor manifestations that affect the structure of the development of the quality of labor force in a certain period of time (Black & Scholes, 1973; Dennis, 1999; Engle, Bollerslev, & Nelson,1993; Markowitz, 1991).

By the process of devolatilization of the quality of labor force we propose to understand the unit of competence set of an individual aspiring to the required level of technical, business (innovative) development of industrial enterprises, existing in the information space of labor market, the demand for which is determined by a buyer (employer), based on the proposed estimated level of professional, qualification and personal value content of its owner (seller), ready for personal labor activity aimed at the successful performance of their professional duties under the influence of self-managed resource – the process mechanism.

In information sources on the IDEF0 methodology, the process is considered as a functional unit that converts inputs to outputs as a result of exposure to necessary mechanisms (resources) in the presence of controlled conditions (Fedorova, Shaforost, Baltyan, & Kolomiytseva, 2018).

As a result of the adopted concept, a completely new concept of "mechanism" is being formed, which is considered as the first element of a certain process, with the help of the second process element – control, it allows realizing a functional state by converting input parameters to output ones. Therefore, the mechanism is nothing more than the resource support of the process, or its material part, including (containing) a set of elements that are interconnected, which are programmed (adjusted) to the features of the functional implementation of the process.

In the process approach, the concept of "mechanism" is differentiated from the concept of "management", which, of course, is a distinctive feature. In other words, management is the main generator of command level effects, while the mechanism acts as the executive component of the system, providing resource conditions for the implementation of the announced command algorithm. Therefore, the authors believe that a certain mechanism in the absence of a management action will be immovable and in expectation state.

As a result, a functional pattern arises, which can be schematically represented as follows: MANAGEMENT → + → MECHANISM = INPUT PARAMETER → / → OUTPUT PARAMETER, and in this case the symbolic combination "→ + →" should be considered as a process of influence, and "→ / → »" is the conversion process.

6. Findings

According to the above mentioned propositions, in the context of the competency-based approach, the authors believe that the socio-economic mechanism should be defined as follows: this is the resource support of the process containing a certain set of competency elements that are in an optimization relationship, which, based on their digital content, are considered as managed units affecting the features of the functional process implementation.

The authors fix the proposed version of the concept of the management mechanism of labor force quality at industrial enterprises. This is the provision of an optimal set of competencies for an individual who, on the basis of his digital state, acquires the ability to implement a management action directed to the information space of labor market resulting from the application a specific analytical and assessment tool, as well as the content of the existing state regulator (Zatepyakin, Filippova, Chesnokova, & Buryhin, 2017).

In the context of this study, the competence set of a person in the process of labor is nothing more than resource support, existing in the form of a full-fledged, integral component of the investigated mechanism.

The theoretical propositions proposed by the authors can be presented in the following economic and mathematical representation (1):

$$F(t) = P_{DKRS}(t) = (\sum X_{KRS}(t) \times DV_{KRS}(t) \times A(t) \wedge, \vee A_{PO}(t)) \times 100\% = \sum Y_{KRS}(t) \to L_{KRS}, \quad (1)$$

where P_{DKRS} – the process of the management of the quality of labor force, taking into account its volatility; $\sum X_{KRS}$ – input (with a high degree of volatility) estimated values of the quality of labor force; DV_{KRS} – the importance of devolatilization of labor quality; A and ($/\backslash$), or ($\backslash/$) A_{PO} is the value of the quality level of the management decision made by an analyst (group of analysts) and, or, by a specialized software analytical product; $\sum Y_{KRS}$ – output (devolatilized) estimated values of labor quality; t is the time value in the established (investigated) segment; L_{KRS} – the value of the level position of the quality of labor; "$\to$ L_{KRS}" – striving for the value of the devolatization indicator of the quality of labor force to the value of the level position of the quality of labor force.

$$F(t) = DV_{KRS}(t) = ((\sum K_p + ID_{KRSp})(t) + (\sum K_{pr} + ID_{KRSpr})(t) + (\sum K_{pr} + ID_{KRSc})(t))) \times 100\%, \quad (2)$$

where DV_{KRS} – the importance of devolatilization of labor quality; ID_{KRSp}, ID_{KRSpr}, ID_{KRSc} – weight values of units of tools (personal, professional and qualification specific content, respectively), introduced into the process of devolatilization; $\sum K_P$, $\sum K_{PR}$, $\sum K_C$ – total estimated values of a set of competencies of personal, professional and qualification specific content, respectively; t is the time value in the established (investigated) segment.

The quality level of labor force is directly dependent on the innovation activity of industrial enterprises. In other words, the level position of labor quality (L_{KRS}) should correlate with the level of technical, business (innovative) development of industrial enterprises, which is embodied in the following expression (3).

$$L_{KRS} = K_i \times 10\%, \tag{3}$$

where, L_{KRS} –the value of the level position of the quality of labor in the considered corridor of volatility; K_i is the coefficient of innovative (technical, business) development of industrial enterprises; 10 % – correction value relative to the estimated score of the scale of technical, business (innovative) development of industrial enterprises.

The coefficient of innovative development (Ki) is determined on the basis of the corresponding scale given in table 1.

Table 01. Scale of technical, business (innovative) development of industrial enterprises

Assessment	Development category	Explanation
2	Minimal development	Development is insignificant and corresponds to the minimum acceptable assessment
4	Promising development	A promising level of technical and business development is established, which helps to draw conclusions about the presence of a number of innovative capabilities in the functioning of industrial enterprise
6	Progressive development	A progressive level of development forms the basis for the existence of a full-fledged innovative format in industrial enterprise
8	Significant development	A pronounced stable, significant level of development of industrial enterprise with a high degree of competitiveness in the market
10	Maximal development	The maximum, highest level of innovative development, which allows determining the dominant position of industrial enterprise in the market
3, 5, 7, 9	Values that determine the intermediate nature between adjacent assesments of the scale	The level of development, establishing a transitional value between grades 2, 4, 6, 8, 10, respectively

Further, specifying the scheme of the investigated process, the authors establish the content of the management element – the managing analytical effect, which will be determined either comprehensively or taking into account variability, such as: "Analyst" (analytical group) ± "Specialized software analytical product", and level values of labor quality parameters forces (competencies) act as input and output process parameters.

For the purpose of functioning, the mechanism for the management of the quality of labor force, taking into account its volatility in industrial enterprises, should include the necessary tools which allow using the relevant competence resources. The investigated tools represent certain methods for the assessment of the quality of labor force, as well as the state regulator in the form of the results of certification of the quality of labor force, which are in an objective relationship and do not allow significant contradictions in their performance and content (Borisova, Zatepyakin, & Yasinskiy, 2019).

According to the definition of the process of devolatilization of the quality of labor force given by the authors, the mechanism of the process of the management of the quality of labor force, with its volatility in industrial enterprises is the totality of resources (a combined criterion of functioning) used in the considered process and interacting among themselves, taking into account the effectiveness of the applied managing analytical impact.

7. Conclusion

According to the authors, a distinctive feature of the proposed concept of the mechanism of labor quality management process, taking into account its volatility in industrial enterprises, is the identification of the resource component, which is inextricably connected with it. Thus, the mentioned process should be perceived with a certain clarification, in which the mechanism and management should be considered as two interconnected dimensions. In other words, the mechanism being studied seems to be the aggregate controlled competency resource of the process itself.

The effective functioning of the mechanism for the management of the quality of labor, taking into account its volatility in industrial enterprises, is based on the inclusion of a certain state regulator in its content, one of which is the process of certification of the quality of labor. The need to use the results of this process during the management of the quality of labor force, taking into account its volatility in industrial enterprises, is to create an objective normative competency-based institution that allows the implementation of the management process with the involvement of an additional level of state control in the considered issue.

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