

The peculiarities of an enterprise intellectual potential bearer's interaction and the identification of their goals

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Abstract. On the basis of literary sources the goals of an enterprise intellectual potential bearers are generalized in the paper. An enterprise intellectual potential functions meant for the achieving of certain results of its activity are defined, the interaction of goals, functions and results are depicted as well. The existing bearers are analyzed and the most suitable way of intellectual potential bearers interaction at an enterprise has been chosen.

Key words: Intellectual potential, intellectual potential bearers goals, intellectual potential functions, an enterprise intellectual potential interaction.

INTRODUCTION

Modern tendencies of all social spheres intellectualization have an immense impact on the peculiarities of economic systems activity of different levels as well, the basis of which are intellectual resources which in their turn form intellectual potential of the given systems. The very entity of intellectual potential is defined as a capability of a bearer of doing something, created by its intellectual resources. In one's turn any economic system (in the paper under consideration the importance has been attached to the consideration of economic system of a microlevel, in other words, of an enterprise) is created and functions for the sake of certain desired result achieving, the goals demanded by the subject of the given system. Taking into consideration the fact that intellectual potential of the subject of activity is mostly defined by the intellectual potential of its workers, its effective application to achieve enterprise goals is possible only

in case of the sequence of individual and collective goals of its bearers. That is why, the most urgent are the problems connected to the identification of intellectual potential bearers goals within an enterprise activity and the investigation of possible ways, directions and models of their interaction with the aim of supplying positive results of their functioning.

MATERIALS AND METHODS

Numerous works by national and foreign researchers were dedicated to the investigation of theoretical and applied aspects of intellectual potential management. However, the analysis of researchers' thoughts testify to a partial problem consideration connected to the primary stages of intellectual potential management, including bearers' goals identification, destination and the directions of their implementation in the subject of activity. Including the authors O. Kendyuhov and Ye. Doktoruk [11, 7] dwell upon the fact that the most important goals of intellectual potential or the products of its realization management is the achieving of economic profit, especially maximization of enterprise profit. V. Petrenko [22] claims that «... the application of any kind of intellect is submitted first of all towards the function of appropriateness – the achieving of positive economic and/or social result...». Without any doubt, the achieving of positive economic effects is a priority goal of an enterprise intellectual potential application, but the question arises, whether there is the capability of

achieving such results without taking into account individual goals and motives of its major bearers which may often contradict to enterprise general goals. I. Moyseneko [20] defines the goals according to the level of hierarchy of higher and lower levels and more complicated goals within an intellectual potential management. However, the author failed to provide an example of such goals within the system of management of the given level of potential. The researcher A.Kapterev [10], defining such goals of intellectual potential management as competence improvement, accessibility, effectiveness and innovation, one dwells on the appropriateness of accounting employees needs (according to the Pyramid of Needs by Maslow). According to practice of enterprise managing, a correct goal choice, their equality to the conditions of functioning and also the definition of ways, directions of interaction of components of systems (the very enterprise) with the aim of achieving of defined goals is a key to successful and long-term functioning at the market. Concerning intellectual potential to which such systemic characteristics as intersequence of bearers' goals are peculiar in the process of their interaction, is one of the basic principles which ensures its effective formation and application.

RESULTS AND DISCUSSIONS

As it is known, any activity must not be arbitrary, but be directed to the achieving of certain result, in other words to the goals achieving. Generally, the term «goal» in economic literature is treated as a certain exact state, peculiarity or index, which is aimed by the subject of managing within a certain period of time.

General ideas concerning the understanding of the given notion are presented in the work by V.Samulyak [24] testifies to the absence of contradictions in the existing definitions. All the definitions given by the author have a common ground and differ only by more or less extended treatment. The author himself in the given paper defines the goals of an enterprise as derived and dependable on the factors impact, desired for the goals achieving and generalizes the factors of the impact on the goals, offers the model of an enterprise and goals management. I. Markovych [18] claims that «the goals reflect exact directions of enterprise activity, representing the ground of strategic management...». The researcher also dwells on the importance of strict hierarchy and mutual submittance of long-term, short-term goals and tasks of an enterprise. The matter of interest is also the work by O. Lyulova [16], where the groups and the character of their influence on enterprise goals are given, the model of analysis of the sequence of existing subject's of managing goals. It is worth adding that apart from all the authors mentioned above [24,16,18], practically all researchers of the sphere of management attach importance to the investigation of the goals of different levels economic systems. This fact

causes the need of considering the given problems on the level of the investigation of intellectual potential of an enterprise.

It is a well-known fact, that the formation and application of an enterprise intellectual potential (FAEIP) must not be a final goal for the subject of managing. Since, the main destination of intellectual potential lies in its application in the process of analysis of industrial-managing problems, the projecting of creative ways of their solution, the search of a well-grounded choice of and realization of managerial decisions. That means that within the hierarchy FAEIP is an additional goal, which submits to general goals and is one of the supplying components of their achieving. Taking into consideration the classification of the existing goals of an enterprise [24,15], it is possible to consider the FAEIP goals which according to the meaning, functions, time direction and management levels, etc. Having generalized enterprise goals into strategic, tactic and operational, we suggest concentrating on their interrelation with the intellectual potential bearers' tasks (as the chosen goals lead to the fulfillment of certain tasks for their achieving) and the functions of the given potential in the process of problem solution to gain a desired result. One should take into account the fact that within an enterprise there exist and must be sequenced collective (enterprise goals in general) and individual goals (on the level of a certain employee). To represent the given connections, the picture is given: fig. 1.

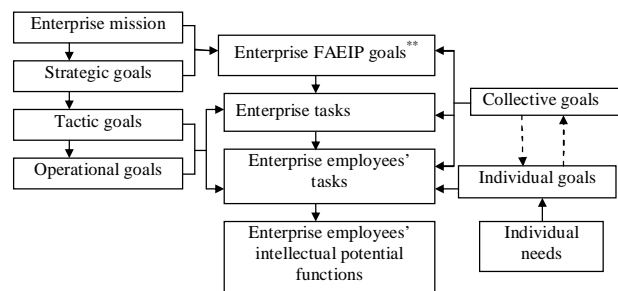


Fig. 1. The interaction of goals, tasks and functions of an enterprise intellectual potential bearers*

* Formed by the authors on the basis of sources analysis [9, 15, 16,18, 24];

** The formation and application of intellectual potential

Concerning the understanding of the collective goals as the ones of an enterprise in general, their character is defined at first by the specificities of a certain enterprise activity. But, at a strategic level they may be generalized as such, which are peculiar to each enterprise: profit rise, market parts, competitiveness, capitalization, etc. [24]. With the help of planning tools they are detailed into tactic and operational, defining the tasks of all managing enterprise system and each employee as well. Since intellectual potential and intellectual activity are intermediary in any industrial or

managing process, then the goals of FAEIP coincide with general collective goals and tasks of the subject of managing.

What concerns the functions of intellectual potential, the level and results of which are defined by intellectual recourses of employees and an enterprise in general, we may define the following:

- informational one [1], which lies in the enterprise supply of informational recourses and the fulfillment of generally known changing actions on them (accumulation, systematization, processing, saving, application, shift). Concerning the informational recourses, they are the core component of intellectual recourses formation. In one's turn, employees' knowledge, skills and experience are transformed at organizational level into a huge component of a general informational recourse of an enterprise. Apart from them, we should here consider the information from outer environment received on commercial or free bases, which is generated by an enterprise artificial intellect. It is also important to note that the realization of an informational function depends on such intellectual recourse of an enterprise as the system of on-duty service relations, which allows formation of the peculiarities of informational recourses exchange in the process of intellectual interaction of an intellectual employees interaction owing to the rules and procedures of an enterprise.

- analytical, being grounded on the existing intellectual recourses and arising from the previous function, it is expressed by the ability to finding and detailed investigation, analysis of actual and possible managing problems of an enterprise, formation of objective, well-grounded conclusions according to the results of their fulfillment;

- investigating one[1] ensures the creating of previously unknown and the imperfection of actual intellectual recourses, conducting of theoretical and applied research with the aim of the search of ideas, decisions, etc.

- creative one, generally lies in non-standard problem solution of an enterprise problems. Such type of intellectual recourse as individual abilities of employees. According to Yu. Kulagin, N. Statinova and others [13], the characteristics of creativity are independent activity, new project orientation and its importance in the society. As well, the authors claim [13] that the problem awareness, the ability to generate original ideas, analytical abilities, creative and abstract thinking are an integral part of creative activity;

- innovational one, is mainly ensured by the fulfillment of previously described functions and is expressed by the activity connected to the creation and application of innovations. A great number of researchers [3,5,8,19,26] dwells upon the investigation of intellectual potential as a constituent part of innovational potential of an enterprise. The question of

the interaction of intellectual and innovational potential in the general structure of an enterprise potential is contradictory. As, on the one hand, it is impossible to create innovations without intellectual activity, and on the other hand, actual knowledge and skills of an employee are not the guarantee of an enterprise innovational success, the achieving of which is a long-term stage and is connected to a great material-technical supply. However, taking into consideration the fact that new(not existing before) or improved knowledge, ideas, decisions and other things are the result of intellectual work, all of them possess the element of innovation that is why it is worth defining an innovational function of intellectual potential, which ensures the actuality of enterprise problems which are in the process of solution, according to modern conditions of economics development which is oriented on innovations;

- motivational, caused by the fact that the existence of certain abilities (the very potential), their understanding encourages the employees to work intellectually, in connection to the receiving of new or application of actual intellectual recourses. In other words, it means that the employees are ready make intellectual efforts for the sake of realization of an enterprise goals. It is connected to collective needs of employees, and also to the fact that owing to the intellect employees are able to realize themselves as a part of certain social groups. This understanding, to some extent rules the behavior of intellectual potential bearers and their goals. Being ready is an intention anyway, when there is an intention, then even if there is a lack of intellect possibly the person will make some effort, gain new knowledge and skills and realize one's goal.

What concerns individual employees' goals, it is generally known that they are derived from needs. The needs in their turn define the stimuli, motives and the behavior of a man for certain goals achievement. The investigation of a phenomenon of man's needs in the spheres of psychology and management have found their reflection in modern theories of motivation, that are arbitrary divided into two groups: those which concentrate their attention on the entity and the types of needs (A. Maslow, U. Ouchee, M. Tuhan-Baranovskyy and others); concentrated on the process of needs satisfaction (the theories of moral, material stimulation, V. Vroom, G. Atkinson and others.) [15]. Being based on the investigation of previously named theories and the results of investigations by N. Maksymchuk and O. Panchuk [17], let us generalize possible individual goals of intellectual potential bearers of an enterprise, which make them work intellectually according to such groups: material, connected to the amount of profit and material life conditions; professional are expressed by the wish to achieve a certain result in the profession and career prospects; social, it means the achievement of certain status among colleagues or in other social groups (admittance, respect, privities, etc); personal imperfection

goals; altruistic, when there is a leveling of personal goals for the sake of other subject's goals. Concerning probable advantages of these or those goals, in the research [22] the author claims that «the people of the economic epoch in their majority are oriented on their needs satisfaction of a higher level in a way of effective transforming of their own potential into innovational intellectual products,... personal intellectual capital.... ».

On condition of different individual intellectual potential bearers' goals the problems of their sequence between employees and collective goals onto which an enterprise activity is directed arise. The majority of researchers of the sphere of intellectual activity dwells upon a necessity of its effective moral and material stimulation. We agree, however claim that it is necessary to consider various variants of possible intellectual interaction between employees.

The problem of subject's behavior within certain system has been actively investigated in modern economics, mathematics, software developing and are

combined into one scientific branch «games theory». Before analyzing actual theories and the possibility to shift their ideas onto intellectual interaction modeling within the enterprise, it is necessary to specify categorical-notional apparatus, which to some extent differs from the one peculiar to economics and management. Including, the notion "game" means «... any players' interaction, where the use of each player depends on one's own action and other players' ones as well» [25]. In the given theories the players are the participants who interact in the system. A goal set of functions which are desired for one is peculiar to each player. The achievement of goals is done owing to strategies, in other word actions done by players. On the basis of scientific sources analysis on the theme under consideration, we generalize in the tab.1 actual game theories and evaluate the possibility of intellectual interaction of intellectual potential bearers with the aim of achievement of their own goals and those of an enterprise in general as well.

Table 1. Comparative characteristics of game theories and the possibilities of their application in the intellectual potential of an enterprise interaction *

The name of a game	Short game characteristics	Possible application to enterprise intellectual potential
Non-cooperative games	Each participant acts independently and simultaneously making an effort to predict the behavior of the rest of the players. The possibility of the sequence of actions and goals and prize redistribution is excluded.	Such game behavior of intellectual potential bearers is irrational, as it contradicts general principles of enterprise functioning and considers all its employees as opponents only. The following of the given theory will lead to the situation when neither enterprise goals nor players' ones will be achieved.
Cooperative games	Players cooperate (make coalition), sequencing their strategies with the aim of maximum achievement of winner prize for coalition and its further distribution among the participants..	It is the best way of interaction of an enterprise intellectual potential interaction and their goal functions maximization.
Static games	All players act simultaneously and only once.	Within an enterprise intellectual potential bearers interaction is held in dynamics without stop, their goals achievement is gradual and demands some time which contradicts to static games principles.
Dynamic games	Players act one by one: the strategy chosen by the first player is analyzed by other players, each of them respectively chooses one's own model of behavior as of one's own goal function and also of a general coalition result. In this process active communication among players is allowed.	Such way of behavior ensures the sequence of goals and their effective achievement. Such type of a game coincide with one of the basic management principle – participation and offers a possibility to take an initiative and take an active part in task fulfillment of enterprise activity.
Coordinational (hierarchical) games	The players within the system act on respective levels. Each level has a coordinator who regulates informational space of a game and can introduce new strategies into it..	Such type of games to a major extent coincides with peculiarities of intellectual potential bearers, as it depicts the scheme of actual enterprises functioning with the existing organizational structures in them, solved problems and are an effective tool for general and individual goals achievement.
Stochastic games	The functions of a prize are unknown and random. The game consists of a majority of stages, at each of which players choose random strategy depending on the circumstances.	The given type of interaction is the best in modern state of environment changeability. However, taking into account a condition of stability of functioning of an enterprise, it can be applied only in some cases of intellectual potential bearers interaction for the solution of single tasks.
Reflexive games	The choice of behavior by each player depends on the rank of reflex ion, it means of one's thoughts about actual game and suppositions of possible strategies and opponents.	Such type of behavior is not peculiar to intellectual potential bearers interaction, it can be held when the player is a certain enterprise in general and the choice of strategy concerning the opponents is made.

* Generalized by authors on the basis of sources analysis [2, 4, 6, 12, 14, 21, 23, 25]

Previously given types of games models are basic and the combinations of which are accessible. For instance, cooperative games may be dynamic or static, coordination games in their entity include cooperative and dynamic ones, etc. Apart from that, described types may be classified according to duration, result prize, information, etc [19]. Major part of modern research is connected to different technologies application in cooperative games. Including European researchers [24] attach importance to the application of SR-nets in cooperative games, which lie in revealing, structuralizing and analyzing of alternative prizes for each participant of a game on other equal conditions.

What concerns the achievement of goals of intellectual interaction among the employees, it is rather desirable to apply basic grounds of coordination games. Coordinators part in the process of such interaction is defined by their ability to introduce new information recourses, new conditions and strategies into a game. Detailed explanation of functions and results of coordinators impact in socio-economic systems with the formulation and addition of certain theorems are given in the following work [18]. Within enterprise work a coordinator is a representative of an existing ruling system. Since the activity of an enterprise is held as a result of all participants interaction, we can consider the coalitions made by them (structural coalitions) as on the level of subunit, and an enterprise in general (general coalition). In this case the coordinators on the subunit level will be their chiefs and for the enterprise – a higher rank of management.

Applying the traditional for the theory of games mathematical tools and indexes [18-25], we will depict a plurality of intellectual strategies of intellectual strategies bearers ($V(S_m)$) within one structural coalition (subunit) of an enterprise (S_m), which possesses characteristic function (expresses affiliation of a separate element of general plurality to a certain subplurality):

$$V(S_m) = \max \left[\sum_{y_{S_m} \in A_{S_m}} K_{iS_m} (y_{S_m}, y_{N \setminus S_m}) \right]. \quad (1)$$

where: m – the quantity of structural coalitions (1, ..., m) of intellectual potential bearers within general N -coalition (enterprise); i – individual intellectual potential bearer of structural coalition S_m (subunit employee) (1, ..., n); K_{iS_m} – the function of i -bearer intellectual potential of structural coalition S_m ; y_{S_m} – target function of structural coalition S_m (y_1, \dots, y_n); $y_{N \setminus S_m}$ – target functions of the rest of structural coalition within a general N – coalition; $y_{S_m} = (y_i), i \in S_m \in A_{S_m} = \prod A_i$ – vector of intellectual potential bearers actions of structural coalition of S_m .

Judging by the above mentioned utterance, the plurality of each structural coalition strategy is directed to its target functions maximization (subunit goals achievement) due to intellectual activity of i – bearer of

intellectual potential of structural coalition potential and depends on existing target functions of other structural coalitions within an enterprise. In this situation, the maximization of target functions of subunits is a guaranty of enterprise goals achievement in general.

As the pic.1, targeted individual goals of intellectual potential bearers, their unities on the level of subunits and enterprises in general are interrelated as well as the functions of the above mentioned subjects, received results (prizes/ failures). Apart from this, the goals, functions and results are not single, but depicted by certain pluralities which correlate. Let, $\left\{ D_i \right\}_{i=1}^n$ – the

plurality of needs of an individual bearer of intellectual potential, which defines the plurality of one's individual goals: $\left\{ A_i \right\}_{i=1}^n$; $\left\{ A_d \right\}_{d=1}^m$ – the goals of an enterprise subuni,

$\left\{ A_e \right\}_{e=1}^p$ – general enterprise goals. General goals form the plurality of functions of employees', subunit and enterprise intellectual potential: $\left\{ F_i \right\}_{i=1}^n, \left\{ F_d \right\}_{d=1}^m, \left\{ F_e \right\}_{e=1}^p$.

The realization of functions plurality leads to certain result of the application of intellectual potential, which characterizes the degree of employees', subunits and enterprise goals achievement: $\left\{ R_i \right\}_{i=1}^n, \left\{ R_d \right\}_{d=1}^m, \left\{ R_e \right\}_{e=1}^p$.

The correlation of defined pluralities is done the following way:

$$\begin{aligned} & \left\{ D_i \right\}_{i=1}^n \mathbf{a} \left\{ A_i \right\}_{i=1}^n, \\ & \left\{ A_e \right\}_{e=1}^p \rightarrow \left\{ A_d \right\}_{d=1}^m, \\ & \left\{ A_i \right\}_{i=1}^n \mathbf{I} \left\{ A_d \right\}_{d=1}^m, \\ & \left\{ A_d \right\}_{d=1}^m \rightarrow \left\{ F_i \right\}_{i=1}^n \subseteq \left\{ F_d \right\}_{d=1}^m \subseteq \left\{ F_e \right\}_{e=1}^p \rightarrow \left\{ R_e \right\}_{e=1}^p \rightarrow \left\{ R_d \right\}_{d=1}^m \rightarrow \left\{ R_i \right\}_{i=1}^n. \end{aligned} \quad (2)$$

Judging by the above mentioned correlations the plurality of needs of an individual intellectual potential bearer is reflected in the plurality of one's individual goals. In its turn, enterprise goals define the goals of each of its subunit, the latter form necessary functions of an employee's intellectual potential, which is involved into the plurality of subunits and an enterprise intellectual potential in general. The realization of the given functions causes the achievement certain results by an enterprise which influence on the results of awards for each employee. We should note that the possibility of the achieving of bearers' goals and the fulfillment of intellectual potential functions is ensured by the

condition of pluralities crossing: $\left\{ A_i^n \right\}_{i=1}^n$ and $\left\{ A_d^m \right\}_{d=1}^m$.

Due to the lack common elements (points of crossing), the achievement of goals becomes impossible, at first of the plurality $\left\{ A_i^n \right\}_{i=1}^n$.

In such case, an employee will not be able to achieve desired personal results working within a subunit or an enterprise in general.

CONCLUSIONS

The uncovering of a problem connected to the goals of intellectual potential bearers and their functions possesses a great practical value in the problem of the given type of potential of an enterprise. In the process of research it has been found out the types of goals peculiar to intellectual potential bearers, including their division into collective and individual, strategic, tactic and operational. The authors also formulated the enterprise intellectual potential functions (informational, analytic, investigating, creative, innovative, motivational) and revealed their entity. The fulfillment of an intellectual potential of its functions will ensure the goals achievement of its bearers.

The most appropriate way of depicting goals interaction, intellectual potential bearers' functions of an enterprise (considering their variety) we consider the application of correlations existing between pluralities. Suggested on the basis of the theory of and mathematic apparatus of coordination games of intellectual potential bearers model within an enterprise has its practical value and reflects the most effective way of maximum realization of goals and receiving desired results of each employee' activity and of each subunit and enterprise as well.

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