

Knowledge work management system in a corporation

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Abstract. The need to form the foundations of a systematic approach to the knowledge work management seems obvious to reviewers. They associate it with the request of complex socio-economic, organizational and economic systems for a predictable and reliable reproducible performance of knowledge workers. Without denying the creative components of this work, but with an emphasis on the nature of its information, the authors insist on the need to ensure the controllability results of intellectual work, especially in corporations.

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Introduction

The economic crisis of 2008 – 2009 years identified a lot of problems and contradictions of the economic model which existed last decades. The priority of financial capital while disregarding of other production factors, unthinking and voluntaristic use of natural resources led to a significant imbalance in many systems. But some high-tech companies and companies that operate in similar specific fields of activity which focused on an idea and knowledge work showed phenomenal stability to crisis and post-crisis phenomenon.

Nowadays the development of scientific and technical progress in the industrialized countries caused as well by the acceleration of creation and dissemination of information allows most of the routine physical and mental work operations to be transferred to machine [1]. We can observe an increase of the share of knowledge workers [2] in developed countries. Increasing interdependence, degree of openness and integration of national economies, which also have the info-technology reasons leads to the deepening of the global division of labor. Post-industrialization [3] (or informatization) of the world and national economies changes the alignment of forces not only in the structure of aggregate economic activity, but also in preparation of resources for the non-market area and the formation of qualitatively new mechanisms of its interaction with market area. During the transformation of the production process the significance of labor functions is changing: labor ceases to be a vital necessity for the majority of the population in developed countries. The primacy of labor functions, consisting in the understanding of labor as a condition of development of human and society is getting more and more theoretical and

empirical confirmations. Therefore a direct personal interest in the development of labor potential is being fixed in the minds of modern people. System of motives of employees, whose labor acquires a new content, is changing: the needs of self-development and self-actualization are activating, the need for creativity and the need for information demand more attention of researchers. In the highest-priority areas of the developed economies, we observe a change of the position of hired knowledge workers. This trend is the result of the displacement of material cost component by ideas value. New possibilities of resources combination appear due to increase of their diversity, whereupon the creative component of many workflows is growing. Increasing of corporate social responsibility moves from the area of funding for social programs and workers' social support to the area of the formation of a set of conditions for the human development. Today, the large corporation has incomparably great resources and qualitative mechanisms for the formation and maintenance of the information environment in which new knowledge is generated. All these circumstances make researchers take a new approach to the consideration of the role and place of knowledge work in complicated economic systems.

Methods (the methodology)

Relevance of the research in the proposed formulation is connected with three important circumstances. Firstly, it is necessity of forming the foundations of system approach to the knowledge work management. This is dictated by the query of difficult socio-economic, organizational and economic systems to obtain predictable and reliable reproducible result of knowledge workers' activity. Without denying the creative component of knowledge work,

but focusing on its information nature, we insist on the need to ensure the controllability of the results of knowledge work, especially in corporations. The knowledge work management system appears to us as not the algebraic sum of the individual knowledge work potentials [4]. The system has properties different from properties of its components. An additional effect of the system (synergy) must take positive values, and it is achieved only by the system approach. Interests of the system may not coincide with the interests of specific knowledge workers. System approach to management make it possible to reconcile interests, or at least neutralize contradictions between them. Secondly, it is a necessity to formalize a knowledge work management system. It should be noted that this is not the formalization of labor (or work), but about the formalization of management system, which is not the identity. The most productive method for studying complex phenomena what is, without doubt, a knowledge work management, is also a modeling method. Simplification of management system based on the principles of "necessary" and "sufficient" makes it possible to focus expert on the most critical areas of management and to neglect unprincipled processes. Thirdly, it is necessity to develop management systems. In Russian corporations further functioning of the economy and the normal life of society is unthinkable without changing of the real management systems. Against the background of attempts to link the success of a company to national culture a growing number of researchers say about erasing of national differences in management and prevalence of corporate features. Main global trends of corporate work management whose analysis was carried out by us fit into the concept called "smart personality-centered management of decent work". This means that despite of the seeming paradoxicalness of formulations formation and development of the knowledge work management system of the corporation – is an objective necessity to enhance the understanding of the phenomenon "corporate knowledge work" and it allows to eliminate a part of the "white spots" in its management. In modern labor economics deep and comprehensive study of the knowledge work on the methodological basis of management science allows us to create a holistic system of ideas about the relationship between labor agents [5], what enhances the degree of manageability of work. The goal of any research in this area should be to find the most effective options for managing impact to knowledge work. Ignoring for obvious objective-historical reasons of knowledge work as the dominant form of labor in the classical and neo-classical political economy [6] and institutionalism [7], as well as the contradictions and different methodological basis, that are available in the

theory of human capital, in the concepts of post-industrial, information and knowledge society, neo-marxist approach became the basis for the formulation of the problem in the methodology of knowledge work management, which, from the point of our view, will connect the elements of the two more common methodologies – methodologies of economic and management sciences. The basic approaches involve the following:

1. The rationalist approach, which is limited with approach to the knowledge work management oriented on their development and self-realization. The combination of these approaches, in particular, makes it possible to draw conclusions about the relationship between investment in intellectual potential and economic growth.

2. The dialectical approach specific of economic and management methodologies, in this methodology allows to include as an equal knowledge work management subsystem management of potential development.

3. The systems approach, borrowed from the methodology of general theory of systems, allows us to research the resource management subsystem from the positions of "black box", presupposing forward and backward relations, as well as the influence of the environment.

The methodology of management should be based on the following target installations:

1. The focus of the methodology should be a human and his development.

2. The methodology should ensure the harmonization of human and systems interests. Wherein, human is presented in two aspects: as an element of the system and as the super-system.

3. In this methodology a system should be considered in statics, dynamics and development.

4. The basic concepts of the methodology should not contradict each other.

5. The methodology should contribute to the development of applied methods and management tools.

Main part.

The proposed methodology of knowledge work management assumes a three-pronged approach to knowledge work resource management, knowledge work processes and the development of knowledge work potential. On this basis we constructed and described a simulation model of a real knowledge work management system, revealed common basic contradictions that demand a solution:

1. Resource management and process management are autonomic and independent.

2. Corporate information as the most important resource of knowledge work is formed and used in principle "here and now".

3. There are no coordinated investment programs of the development of knowledge work potential.

4. Formalization of knowledge workflows does not get enough attention (possible reason – the "vitality" of the myths about the impossibility of knowledge workflows standardization).

5. The exclusive focus of the management processes "top – down".

Developed reference model of knowledge work management obtained by imposition of developed methodology on classical functional management model. This model allows to present knowledge work management as a system of ordered and interrelated elements and has a number of advantages:

1. The presence of a strict sequence of the management functions realization, which defines the logic of the knowledge work management: from definition of the management objectives to monitor of the extent of its progress.

2. Isolation of three interrelated aspects in the corporate knowledge work management, each of which can be considered as an independent subsystem.

3. The possibility of a new approach to work clustering related to the knowledge work management. In corporation it is expedient to be implemented around these aspects, thereby ensuring the condition in which various management functions within a single aspect performed by one department.

4. The possibility of an integrated assessment of the efficiency of knowledge work management in the corporation, which will allow subjects of corporate management to make better decisions.

Table 1. Controlled variables of knowledge work management system in a corporation (KWMS)

KWMS subsystem	Controlled variables
Subsystem of RKW management	Availability of knowledge workers with certain characteristics in the corporation
	The growth rate of the average wage per knowledge worker compared with the growth rate of average wages, as well as the growth of inflation and labor efficiency per worker in corporation
	Ensuring of higher growth rate of resource cost of knowledge work towards the growth rate of production costs
	The cost: effectiveness of the maintenance of knowledge workers (including the use of external patents, corporate knowledge management system and information security, workplace organization)
Subsystem of KWF management	Loss of working time associated with searching the information
	Indicators of irrational use of knowledge work
	The degree of interrelation of knowledge workflows and valuation parameters of knowledge work
Subsystem of ILP management	The degree of satisfaction of knowledge workers by workflows
	The percentage of knowledge workers covered by the system of personnel development, in a total number of employees in corporation
	Profitability of costs for staff development
	The number of corporate conflicts in a social and labor area involving knowledge workers
	The education costs and professional development of knowledge workers
	The internal corporate education system maintenance costs attributable per a knowledge worker

The methodology makes it possible to develop a mathematical description of the optimization model [8]. Therefore, controlled variables groups of

knowledge work management system were formed (Table 1).

Methodical support of knowledge work management assessment in a corporation proves the possibility of use of variable approach to the selection of specific tools and techniques. Multidirectional dynamics of separate indicators can seem to be difficult for researchers, so a natural solution would be to use the Balanced Scorecard and scoring systems [9], which involve creativity and high flexibility. They can be corrected not only in terms of a reference point (point scale and extremes), but also of a set of evaluation criteria. By virtue of labor content of such techniques, it seems to us that the most prospective would be looking for the objective single synthetic indicators, which characterize important property for us. An appropriate synthetic coefficient included in a "golden rule" of management is offered as summative evaluation of knowledge work management efficiency in the corporation. The calculation formula to determine the coefficient of knowledge work management efficiency is based on the traditional understanding of the management efficiency. The coefficient of economic efficiency of knowledge work management efficiency in a corporation – an indicator, which characterizes the results of corporate knowledge work management per 1 ruble of management costs:

$$K_{kwm} = \frac{N'_{ms} \times LP \times \left(\frac{100 + SEE}{100} \right)}{C_{\Sigma}} \quad (1)$$

где: N'_{ms} – number of managers and specialists (MS) per one employee, functionally employed by labor management, people; LP – labor productivity per one worker in corporation, currency units/ people; SEE – share of the economic effect of rationalization proposals and inventions in the value of the gross added value, %; C_{Σ} – cost of maintaining for one work management system worker in corporation, currency units.

The conclusion.

The absolute value is less illustratively than its change over time. Just change of this coefficient in relation to the change of some other parameters allowed to formulate a "golden rule" in knowledge work management in a corporation: Improving the quality of management of knowledge work potential development should grow faster than knowledge work management efficiency, and the latter in its turn should outperform the improving of knowledge workflows [10] and knowledge work resources management (Figure 2).

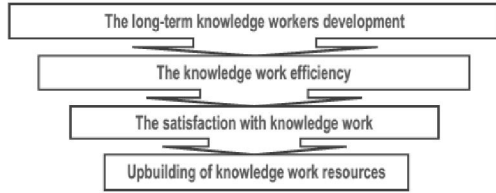


Figure 2 General logic of the "golden rule" of knowledge work management in a corporation
In other words:

$$I_{nms} < I_{1-turn.ms} < I_k < I_{scms} \quad (2)$$

That is, the growth rate of knowledge work management efficiency coefficient (I_k) must exceed the growth rate of the indicator, associated with an active turnover of knowledge workers ($I_{1-turn.ms}$), and that indicator in its turn – the growth rate of their numbers (I_{nms}). To maintain this positive trend, a more rapid increase of the education cost per knowledge worker in corporation (I_{scms}) in relation to all these growth rates is essential.

Table 2. The results of approbation of the "golden rule" in the knowledge work management of Open Joint Stock Company "TTT"¹

	2006	2007	2008	2009	2010	2011	2011/2006
Number MS, people	8346	7652	7141	6889	6881	6869	
Growth rate of number MS, %		91,68	93,32	96,47	99,88	99,83	82,30
Turnover MS, %	6,9	7,3	6,9	7,6	7,5	7,2	
1 – turnover MS, %	93,1	92,7	93,1	92,4	92,5	92,8	
	2006	2007	2008	2009	2010	2011	2011/2006
Growth rate (1 – turnover MS), %		99,57	100,43	99,25	100,11	100,32	99,68
Fulfillment of the I condition		yes	yes	yes	yes	yes	yes
Knowledge work management efficiency coefficient	300,1	301,26	281,56	274,62	276,1	351,21	
Growth rate of knowledge work management efficiency coefficient, %		100,39	93,46	97,54	100,54	127,2	117,03
Fulfillment of the II condition		yes	no	no	yes	yes	yes
Education cost MS, currency units	23,21	26,11	24,61	19,75	30,32	38,21	
Growth rate of education cost MS, %		112,49	94,26	80,25	153,52	126,02	164,63
Fulfillment of the III condition		yes	yes	no	yes	no	yes
"Golden rule" performing		yes	no	no	yes	no	yes

The inference. Approbation has shown (Table 2) that the proposed rule is carried out in 2006-07 and 2009-10, and also while considering changes in the quality of knowledge work management for the 6-year

¹ Conditional name

period, which partly is correlated with the evaluation results according to other methods. At the same time "problem areas" of management are becoming more available and obvious: low efficiency and reducing the cost of the knowledge work potential development are typical for the period of global crisis negative effects, as well as for the period of priority investment in the oil unit of this company. At the same time the situation with the availability of knowledge workers and their relative satisfaction for the whole period is quite favorable, which is also confirmed by a number of independent researches.

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