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THE METHODIC APPROACH TO THE DIAGNOSTICS OF INTERNAL COMMUNICATIONS AT THE INDUSTRIAL ENTERPRISE

The article presents the algorithm of diagnostics of internal communications condition, described object, subject and tasks of diagnosis. Shown the formed classification of indicators evaluation the effectiveness of internal communications in four areas (organizational, social-psychological, technical & technological, informational) and characteristic of individual indicators, which formed the basis of the proposed approach. Generated the matrix diagnostics the state of the internal communication processes with the choices of managerial actions.

Keywords: internal communication, diagnostics, algorithm, parameters, diagnostics matrix.

Thematic justification. The constant change of market conditions is necessary constituent in the industrial enterprises activity. Recently, geopolitical changes greatly influence the markets development, industrial enterprises activity, lead to necessity of the enterprises quick reaction to the proper tendencies. That's why flexibility, ability quickly to rebuild activity, accuracy of decisions define enterprises competitiveness and ability for existing. It's impossible to achieve the mentioned specifications without interior communications efficient system formation, which will provide necessary information, ability to use it at the necessary moment, ability quickly to embody new decisions into the enterprise activity, readiness for changes etc. Therefore building of the internal communications management system as a base for successful functioning and constant development at the industrial enterprises, requires deep understanding of its essence and constituents, and diagnostics tools investigation, evaluation and strategy forming.

Analysis of publications. Studies of communications at the organizational level are described in works of the following scientists: A.O. Bosak [1], J.M. Leykhif [4], T. Sytnyk [11], K.S. Surovtseva [9] etc. Informational and technological constituents are estimated by M.Yu. Zhuravel [3], M.M. Mandzyuk [5], N.G. Metelenko [7], I.V. Simenko [14], N.O. Shpak [13], O.O. Shubin [14] and others. Peculiarities of the social and psychological constituent are described in works of R. Mansurov [6], T. Momot [8] and others. However, complex estimation of the enterprise interior communications considering all mentioned elements in the industrial enterprises communicational activity has not solved yet.

The aim of the article is to develop methodic approach to diagnostics of internal communications within business-processes management at the industrial enterprise considering all elements in the interior communicational processes.

Main material. Initially, one has to mention that internal communications (IC) are suggested to be process of information exchange between separate persons and/or groups of persons at various levels in the organization management owing to traditional and modern tools and means, considering peculiarities of the enterprise communicational activity organization, provides participants' accurate determination in the process and regulation of their interconnections and allows to evaluate IC from business-processes position.

In general, owing the differing character of approaches to estimate internal communications state, study of their separate constituents and necessity to form the only approach to diagnose internal communicational processes (ICP) at the enterprise, considering its all constituents, IC diagnostics procedure at the enterprise is suggested to conduct by the investigated diagnostics algorithm (Fig. 1). It provides consequent stages passing and allows to structure this process.

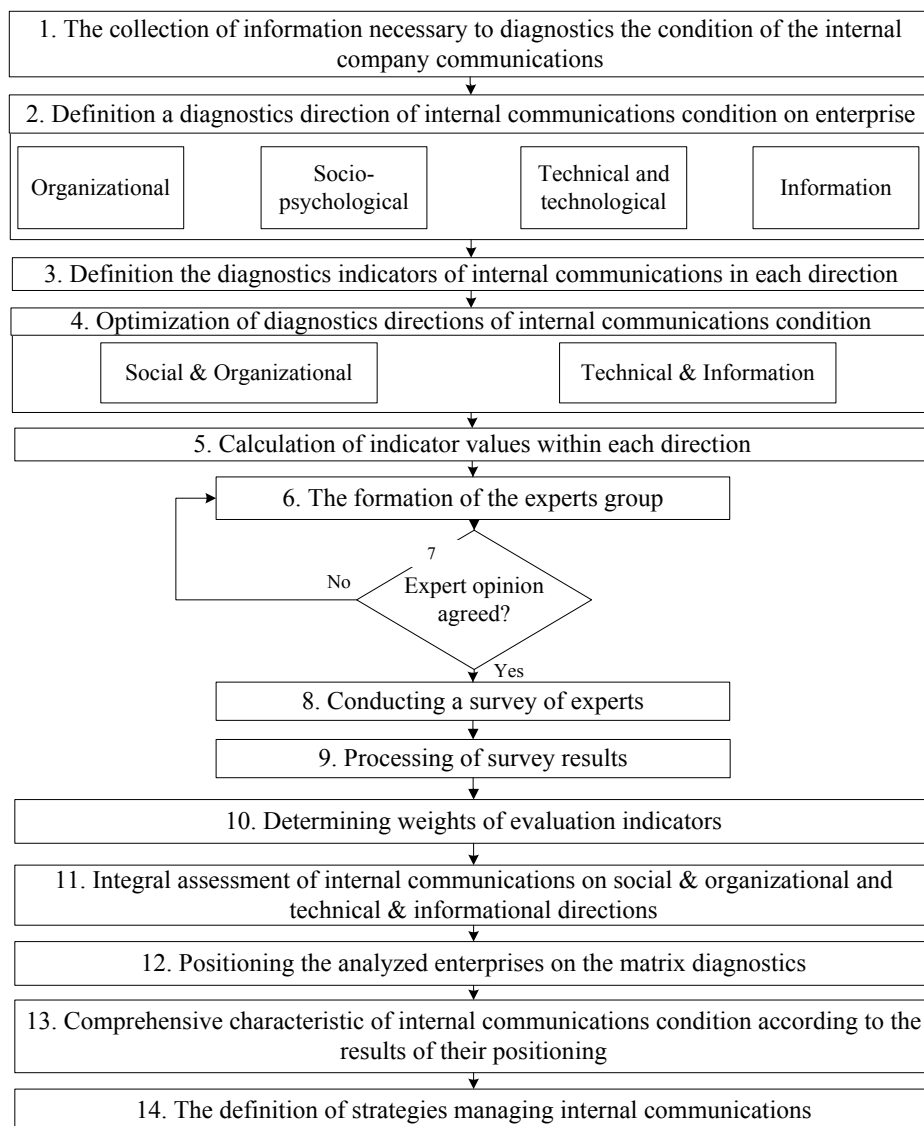


Figure 1 – Diagnostics algorithm of internal communications condition on industrial enterprises

Thus, one of the first stages is to determine diagnostics directions, including object, subject and tasks of analysis and to estimate efficiency by the enterprise communicational processes.

Correspondingly the object of diagnostics is ICP system with the following components: organizational subsystem, informational, technical and technological, social and psychological subsystem.

The subject of diagnostics within organizational subsystem comprises the following elements: managerial technologies, organizational structure of management, personnel.

In this case tasks are:

- to evaluate the achieved results;
- to define personnel work efficiency;
- to determine real level of the workers' competence;
- to reveal necessities to advance qualification;
- to estimate managerial decisions at their development stage;
- to estimate intermediately the conduct of made managerial decisions etc.

Informational subsystem has such elements as communication lines and nets. Therefore the process of communications estimation has the following tasks:

- to analyze feedback existence;
- to analyze communicative breaks existence;
- to find information reliability;
- to estimate information sufficiency;
- to determine communicative connections duration etc.

Within technical and technological subsystem the following subjects of estimation are foreseen: software, hardware, information processing system.

In this case diagnostics tasks include:

- analysis of the necessary technologies sufficiency;
- determination of the software availability;
- determination of the informational security level;
- analysis of the users' workload with computers etc.

Thus the social and psychological subsystem has such components which are subjects of the interior communications diagnostics, as: social interconnection, roles in the management system, psychological peculiarities.

The interior communications diagnostics tasks include:

- analysis of the personnel social adaptiveness;
- finding of the workers' psychological portrait;
- receiving of information about social and psychological climate in team;
- analysis of the workers' interconnection levels;
- estimation of devotion degree, workers' motivating etc.

It's necessary to set criteria for every diagnostics object element to estimate them. Having analyzed various approaches [1; 3-14] one suggests classification of factors according to the mentioned subjects of the communication estimation in the following directions (Fig. 2): organizational, technological, social and psychological, informational.

One has to point out that there are quantitative and qualitative factors among given ones to diagnose the ICP state (the last are based on the experts' estimation). Thus experts' estimations are based particularly on workers', managers of different levels, production lines and control questioning.

The next phase is formalised assessment, which provides calculation of the three most

common ratios in accordance with selections of components (one for each subject of evaluation) for each direction.

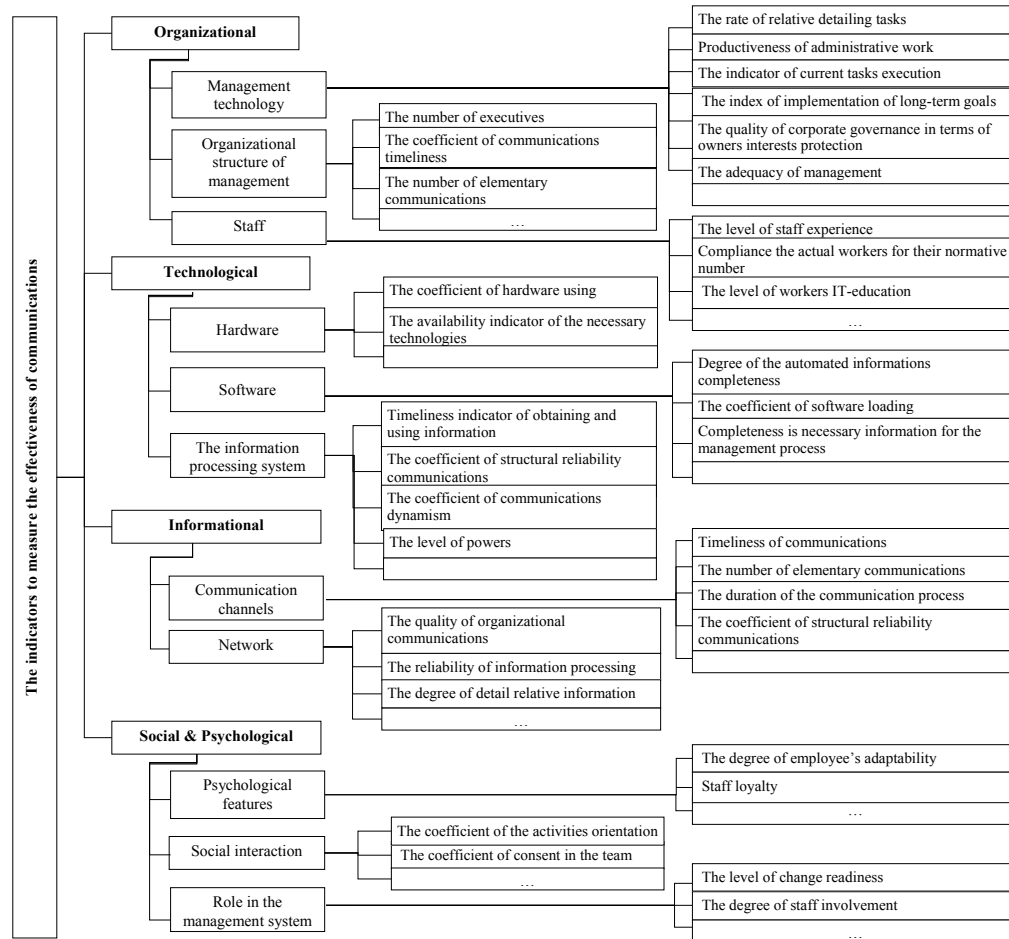


Figure 2 – Classification of indicators to measure the communications effectiveness by the constituents elements of the internal communications system on the industrial enterprises (fragment)

Selection coefficients based on the company's specific and primary purpose, goals and objectives of the communication management evaluation. Indicators for which will be made calculations are given in Table 1.

At the same time qualitative indicators convert to relative using the following formula:

$$K_{qual.} = \frac{O_{ent.}}{O_{max.}}, \quad (1)$$

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where $O_{ent.}$ – a quality score in points, which the company received in the i-th indicator; O_{max} – the maximum possible score in points for the indicator.

Table 1 – Indicators of the system of internal communications diagnostics

Approach	Indicator	Formula	The components essence.	Reference value
Organizational	The factor of safety management system	$K_{saf.} = 1 - \frac{K_{unsold}}{K_{tot.des.}}$	K_{unsold} – number of unsold solutions; $K_{tot.des.}$ – total number of decisions taken in the division	1
	The coefficient of overlapping functions	$K_{dupl.} = 1 - \frac{K_{dup.works}}{K_{norm.works}}$	$K_{dup.works}$ – number of works that are duplicated within the division; $K_{norm.works}$ – normative number of works in division	1
	The level of staff experience	$K_{exp.} = \frac{K_{nes.exp.}}{K_{tot.empl.}}$	$K_{nes.exp.}$ – number of employees with the necessary knowledge and skills, people; $K_{tot.empl.}$ – total number of employees, people	1
Social (psychological)	Staff loyalty	Calculate the concordance coefficient to determine the degree of concordance of experts' opinions on the types of questions		installed by experts
	Calculate the coefficient of consent in the team	$K_{rc} = \frac{n \sum (E_{ei})^2 - (\sum E_{ei})^2}{n^2}$	n – the number of interviewed workers; E_e – employee assessment; i – the number of the employee	area of unity is in the range from 0 to 1
	The degree of staff involvement	Expert assessment of the criteria involvement in solving corporate tasks, the interest in work; initiatives and focus on improving the efficiency of their work and the work of the whole enterprise		installed by experts
Informational	The presence of communication gaps	Expert assessment, based on a finding any discrepancies between the quantity, quality and timeliness required and in fact the received information for the successful implementation of the labor process		installed by experts
	The coefficient of informations completeness	$K_{comp.inf} = \frac{I_p}{I_{neces.inf}}$	I_p – the amount of information available to the decision-makers, %; $I_{neces.inf}$ – the amount of information necessary to make an informed decision	1
Technical and technological	The coefficient of software loading	$K_{soft.load.} = \frac{N_{us.}}{N_{soft}}$	$N_{us.}$ – number of computer's potential users in enterprise; N_{soft} – number of installed on the computer units of software products, units	1
	The coefficient of hardware using	$K_{hardw.us.} = \frac{n}{N_{us.}}$	n – number of computers in the information system	1
	Timeliness indicator of obtaining information	$K_{timeline.} = \frac{I_{timeline.}}{I_{neces.}}$	$I_{obt.}$ – volume of the information received in a timely manner, %; $I_{neces.}$ – amount of information necessary to make an informed decision, %	1

Taking into account the presence in the classification quantitative and qualitative indicators is proposed to apply the relevant scale, allowing to represent values of between 0 to 1. In accordance, desired value indicators is in the range (0,66-1).

However, having regard to gravity of availability interrelated indicators and a high degree of probability of occurrence duplication settlement we propose narrow down the number of components to two diagnostic groups of indicators:

1) social and organizational (a combination of organizational, social and psychological components). Within this component provided for the calculation of indicators such as: coefficient of management reliability, staff loyalty, cohesion in the group, the index productivity growth;

2) technical and information: the information processing reliability, completeness of the information, software workload coefficient, coefficient of computer using.

The next stage of diagnosis is integral indicator calculation for each components taking into account the its importance:

$$K_{int} = \sum_{i=1}^n K_i \cdot V_{ai}, \quad (2)$$

where K_i – value of i -th diagnostic coefficient; V_{ai} – importance of i -th diagnostic coefficient; n – diagnostic coefficients numbers ($n = 3$).

Importance determined by an expert for each particular company to reflect the specificities of an activity. Experts are leaders and experts analyzed the company and involved (if necessary) specialists. They are experts in the analyzed market segment.

Sum of importance indicators for each component must be equal to the unit, sum of importance in each component of the system of internal communications should also be equal one.

To determine the reliability of the results and coherence of expert opinion will be calculated concordance coefficient and Pearson criterion [2].

The received values of the generalized integral factors by the social and organizational and technical and informational components concerning enterprise interior communications are put to the summery table. To estimate enterprise interior communications it is proposed to form matrix of their state diagnostics (Fig. 3).

It has 9 quadrants, received after division of quadrant 1x1 into equal parts. The values of social and organizational component are put on the vertical axis, technical and informational ones – on the horizontal axis. The enterprise is positioned on the matrix depending on integral factors values in the mentioned components. Matrix has three zones: “involving” zone, “variable communications” zone, “communicative gap” zone. Due to the positioning enterprise appears in one of quadrants. It allows to imagine and evaluate interior communication state at the enterprise.

Characteristic of quadrants is presented in Table 2.

The quadrant with coordinates $K_{soc.-org.}(1-0,66):K_{techn.-inf.}(1-0,66)$ is the best location. It is the highest level of the both constituents development. In such situation enterprise has to keep the interior communicative processes existing state, avoiding the enterprise value decrease in general and particularly business-processes efficiency. Ideally all enterprises have to orient the interior communications management to be in this quadrant.

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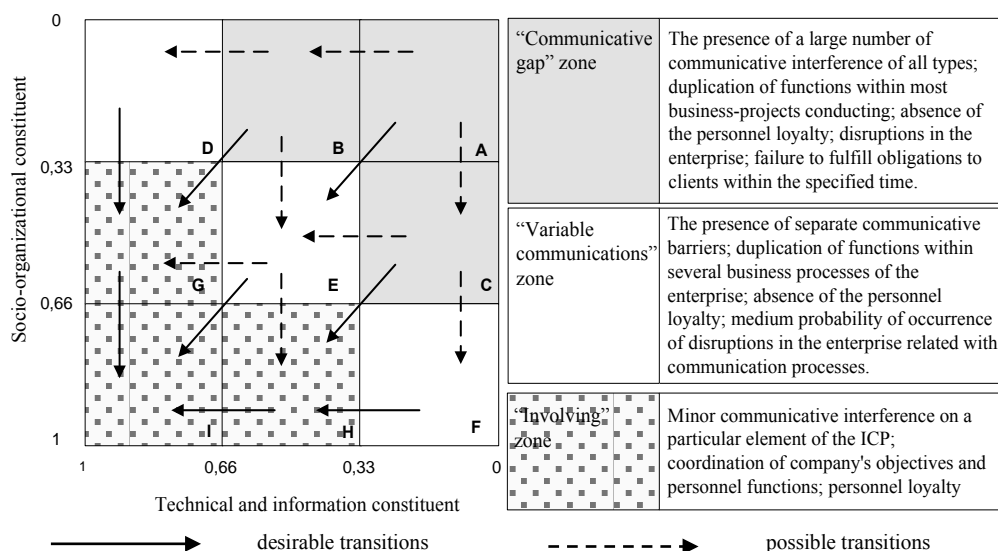


Figure 3 – Matrix diagnostics of ICP condition with the choices of managerial actions

Table 2 – Characteristics of ICP diagnostics matrix quadrants

Zone	ICP state characteristics	Quadrants characteristics		
		Coordinates/level		Essence
		Soc.-org. constituent	Technical-inf. constituent	
1	2	3	4	5
“Communicative gap” zone	Great number of all types communicative blocks; duplication of functions within all	[0,33-0] Low	[0,66-0,33] Average	Separate communicative barriers, informational flows breaks, duplicate channels of messages delivery; duplication of functions within most business-projects conducting; absence of the personnel loyalty, low level of readiness for changes, unfavourable social and psychological climate in team, low degree of the management reliability
	Business-process at the enterprise; absence of personnel loyalty; failures in enterprise work; nonfulfilment of duties for clients in the fixed term	[0,33-0] Low	[0,33-0] Low	Duplication of functions within most business-projects conducting; absence of the personnel loyalty, low level of readiness for changes, unfavourable social and psychological climate in team, low degree of the management reliability; low degree of the information reliability, great duration of the communicative processes, absence of the necessary software and hardware optimal quantity
		[0,66-0,33] Average	[0,33-0] Low	Duplication of separate functions, low level of readiness for changes, volatile social and psychological climate in team; low degree of the information reliability, great duration of the communicative processes, absence of the necessary software and hardware optimal quantity

Table 2 (continued)

1	2	3	4	5
“Variable communications” zone	Communicative breaks of separate types; duplication of functions within some business-projects conducting at the enterprise; absence of enterprise personnel loyalty; average degree of the errors probability in the enterprise work, connected with communicative processes	[0,33-0) Low	[1-0,66) High	Duplication of functions within most business-projects conducting; absence of the personnel loyalty, low level of readiness for changes, unfavourable social and psychological climate in team, low degree of the management reliability; optimal number of the necessary equipment and technologies, high degree of information reliability and information timeliness providing
		[0,66-0,33) Average	[0,66-0,33) Average	Separate communicative barriers, informational flows breaks, duplicate channels of messages delivery; duplication of some functions, low level of readiness for changes, volatile social and psychological climate in team
		[1-0,66) High	[0,33-0) Low	Loyal personnel existence, high degree of the management reliability, favourable social and psychological climate; low degree of the information reliability, great duration of the communicative processes, absence of the necessary software and hardware optimal number
“Involving” zone	Possible existence of little communicative barriers by the proper ICP element; coordination of enterprise targets and personnel functions; enterprise personnel loyalty	[1-0,66) High	[1-0,66) High	Loyal personnel existence, high degree of the management reliability, optimal number of the necessary equipment and technologies, high degree of information reliability and information timeliness providing
		[1-0,66) High	[0,66-0,33) Average	Favourable social and psychological climate, high degree of the management reliability, separate communicative barriers, informational flows breaks, duplicate channels of messages delivery
		[0,66-0,33) Average	[1-0,66) High	Optimal number of the necessary equipment and technologies, high degree of information reliability and information timeliness providing; duplication of separate functions, low level of readiness for changes, volatile social and psychological climate in team

The worst location is quadrant of the “communicative gap” zone with coordinates $K_{soc.-org.}(0,33-0):K_{rtechn.-inf.}(0,33-0)$. Such enterprise is characterized with real absence of the strong communicative links, absence or inefficiency to use hardware and software. It leads to often failures in the enterprise work, and thus to great decrease of the business-processes efficiency.

The last stage is to investigate proper recommendations to improve ICP management at the industrial enterprises.

In such case it is necessary to establish cooperation between personnel and administration, to build well-defined system of the communicative flows. Otherwise the enterprise can be liquidated owing to its inefficient activity.

The resultant table provides the analysis of concrete enterprise interior communications, further actions strategies investigation concerning their realization and development and grounding of the proper recommendations. Principles and methodic to form improving acts for interior communications system management will be observed in the next sections.

Conclusions and perspectives for further researches. Thus, the existing approaches to estimate and diagnose enterprise IC state are analyzed. It makes possible to determine

advantages and disadvantages of the existing methodic. The conducted analysis provides system of interior communications estimation factors, which consider author's approach to distinguish in enterprise ICP a few constituents. Separate factors (quantitative and qualitative) are suggested to use for every structural element. Quantitative factors are indexes, measured from 0 to 1. Qualitative factors are transferred into relative estimations, through division of concrete enterprise factor by maximal value of the factor. It makes possible to calculate integral factors for every constituent element in the interior communications system (interior communications subsystems). Integral factors take into account factors weight, defined by expert method, considering calculation of the experts' thoughts agreement degree. The expert method helps to consider enterprise branch specifics, and concrete enterprise features. The suggested system of factors proposes to build enterprise positioning matrix depending on enterprise interior communications state. It takes into account socio-organizational and technical and informational constituents state. The proposed matrix helps visually to evaluate interior communications at the enterprise, to distinguish and to estimate variants crossing between quadrants with purpose to increase interior communications level. In future it gives chance to develop further strategic actions to improve interior communications system management and to calculate prognosticated value of the business-process economic effect, considering interior communications processes state at the enterprise.

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Формування методичного підходу до діагностики стану внутрішніх комунікацій промислового підприємства

У статті подано алгоритм здійснення діагностики стану внутрішніх комунікацій; описано об'єкт, предмет та завдання діагностики. Наведено сформовану класифікацію показників оцінювання ефективності внутрішніх комунікацій за чотирма напрямками (організаційний, соціально-психологічний, техніко-технологічний, інформаційний) та характеристику окремих показників, що лягли в основу запропонованого підходу. Сформовано матрицю діагностики стану внутрішніх комунікаційних процесів із варіантами вибору управлінських дій.

Ключові слова: внутрішні комунікації, діагностика, алгоритм, показники, матриця діагностики.

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Формирование методического подхода к диагностике состояния внутренних коммуникаций промышленного предприятия

В статье представлен алгоритм осуществления диагностики состояния внутренних коммуникаций; описаны объект, предмет и задачи диагностики. Приведены сформированная классификация показателей оценки эффективности внутренних коммуникаций по четырем направлениям (организационный, социально-психологический, технико-технологический, информационный) и характеристика отдельных показателей, которые легли в основу предложенного подхода. Сформирована матрица диагностики состояния внутренних коммуникационных процессов с вариантами выбора управленческих действий.

Ключевые слова: внутренние коммуникации, диагностика, алгоритм, показатели, матрица диагностики.

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