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State evaluation procedure of management cycles in management processes reengineering at an enterprise

Procedimiento de evaluación estatal de ciclos de gestión en la reingeniería de procesos de gestión en una empresa

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Contents

ABSTRACT:

The relevance of research problem is determined with the need to develop a fundamentally new integrated state evaluation procedure of management cycles as main components of management processes reengineering at the enterprise. The functionality of study and the simplicity of calculations have proved the effectiveness of the proposed procedure and the practicability of its use in management processes reengineering at the enterprise, which allows to identify the blind sides and to develop reinforcing measures that ensure high efficiency of management system at the enterprise.
Keywords: procedure, state evaluation, indicators, reengineering

RESUMEN:

La relevancia del problema de investigación se determina con la necesidad de desarrollar un procedimiento de evaluación de estado integrado fundamentalmente nuevo de los ciclos de gestión como componentes principales de la reingeniería de procesos de gestión en la empresa. La funcionalidad del estudio y la simplicidad de los cálculos han demostrado la efectividad del procedimiento propuesto y la viabilidad de su uso en la reingeniería de procesos de gestión en la empresa, lo que permite identificar los lados ciegos y desarrollar medidas de refuerzo que garanticen una alta eficiencia del sistema de gestión. en la empresa
Palabras clave: procedimiento, evaluación estatal, indicadores, reingeniería.

1. Introduction

The validity of modern dynamic life and market relations requires constant improvement of management models of business processes, which in turn requires new content state

evaluation approaches of management processes and all enterprise management cycles as its components. Also, as a consequence, the relevance of the research problem is determined with the need to develop a fundamentally new integrated state evaluation procedure of management cycles in management processes reengineering at the enterprise.

The hypothesis of this study was to prove the relevance and necessity of developing an effective and innovative approach to state evaluation of management cycles in management processes reengineering at the enterprise.

The purpose of the study is to develop a fundamentally new state evaluation procedure of management cycles in management processes reengineering at the enterprise, presented as a group of indicators that ensure the qualitative analysis, evaluation and identification of reserves of management processes through the cyclic content of management processes reengineering at the enterprise.

In our opinion, the development of such evaluation procedure of management processes reengineering through state evaluation of management cycles in conditions of modern high dynamic activity of enterprises is of particular importance.

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2. Literature review

Special attention to the problems of evaluation indicators of management processes has been recently given by such researchers as: Nesterenko V.P., Petrushin S.I., Gubaidulina R.Kh., Pashkova L.A. (28), Balashova E.S. (6), Antipov D.V. (5), Tsapko S.G. (45), Hammer M. (17), Gromov A.I. (15), Jeston D. (19).

It is obvious, that the reengineering approach has already provided for the introduction of innovative technologies in its essence and content, which is also meant in our approach to the evaluation indicators. The works, devoted to the stated problem, are of special importance and the authors of such works are: Bondarenko V.V., etc. (8), Romanova A.D. (37), Osipov V.A. (30), Folomyev A.N. (10), Khan M. A., Panarina E. (20), Kuznetsov B.L., Kuznetsova S.B. (22), Gerasimov B.N., Novikova N.A. (13), Sukharev O.S. (42), Rozhdestvenskiy A.V., Golov R.S. (38), Andreeva E.S., Nechaev A.S. (4), Akatov N.B., Panarina E. N. (2), Tsymbalov A.A., Degtyareva E.D. (46), Berlin Center of OECD (35), Pertsev S.B. (33).

The issues of developing the models of reengineering activities for enterprise management, business process design and business process reengineering (BPR), the use of business process reengineering methods, assessing the impact of risks on the effectiveness of reengineering projects, etc., are studied in the works of such scientists as Avramovich N., Baosich M., Karich M., Berich D., Boyich Z., Yuovanovich V., Radosevich M. (36), Gunasekaran A.(16), Dassisti M. (9), McSwiney J.(23), Melo A. C., Fernandez E. (24), Mtsrkova M., Raynoga R. (44), Stefanesku L., Konstantinesku M. Stefanesku A., Konstantinesku P. (41), Suyova A., Marchinekova K., Hittmar S. (43), Nekrasov R.Yu., Tempel Yu.A., Tempel O.A.(27), Ferreira Kh.M., Shpak N., Sorochak O. (40).

For selection the most effective method of process management implementing at the enterprise, various methods of evaluation the effectiveness of business processes were developed. Modern developers of such methods are: Shapagatov S.R., Kartseva N.S., Valiullova R.I., Batanova M.V. (39), Istomina S.V. (18), Piksaikina O.V., Khodeneva E.A. (34).

Great attention to the problems of managing various systems and economic objects relating to our research has been given in recent years by such scientists as: Grigoriev S.N., Kutin A.A. (14), Alferov V.N. (3), Bashkatova Yu.I., Reshetko N.I. (7), Mikheev A.G. (25).

The scientists, who made a significant contribution to the development of management processes reengineering concept, are: Abdullaeva T.K. etc. (1), Parakhina V.N., Solomina K.A. (32), Gamidullaev R.B. (11, 12), Ogoleva L.N. (29), Oykhman E.G. (31), Mosyakov I.V. (26), Komissarova M.A. (21)

An incomplete picture of the problem, theoretical and practical significance has determined the need to develop a fundamentally new state evaluation procedure of management cycles in management processes reengineering at the enterprise that characterizes generally the

content state of management processes.

3. Methodology

Developing state evaluation procedure of management cycles in management processes reengineering at the enterprise, it is especially important to take into account the content state of management process. The management process, like any process in the socio-economic system, has a rich content that reveals the set of its operations, grouped according to its stages.

So, the organizational content of the management process is shown in a sequence of organizational leverages and is expressed in the stages of regulation, norm setting, recommended practices, and responsibility.

In the proposed procedure, each group of indicators basically characterizes the content and discloses information support for management processes. Developing this procedure, the works of next researchers were used: Nesterenko V.P., Petrushin S.I., Gubaidulina R.Kh., Pashkov L.A. (28), Balashova E.S. (6), Antipov D.V. (5), Tsapko S.G. (45), Hammer M. (17), Gromov A.I. (15), Jeston, D. (19).

Developing this procedure, the materials of determining consolidated indicators, various branch research institutes, and various effectiveness evaluation procedures of business processes were generalized, modern developers of which, are: Shapagatov S.R., Kartseva N.S., Valiullova R.I., Batanova M.V. (39), Istomina S.V. (18), Piksaikina O.V., Khodeneva E.A. (34).

For calculation the indicators of the proposed procedure, the documents of statistical and accounting reporting, operational accounting, etc., as base values, are used. When the values at the enterprise are absent (for example, development and implementation of operation cards, management procedures, etc. at some enterprises), it is necessary to do a suitable research, the results analysis of which, can provide base values.

4. Results

Below we propose our state evaluation procedure of management cycles in management processes reengineering at the enterprise, where evaluation indicators of each cycle of management process are separately presented.

Let us dwell in detail on our evaluation procedure of **organization cycles** as the most important technological component of the management process reengineering.

Quantitatively, each of the indicators, offered below, is evaluated by an appropriate coefficient, the number value of which can be more than "0", but less than "1".

This group includes evaluation analysis indicators of the organizational cycle of the management process, which characterize a sequential use of organizational leverages: regulation, norm setting, recommended practices, and responsibility.

1. The coefficient of management processes regulation – Oregl., characterizes the order of all participants' interaction in management activities and allows to set the order of the management process functioning, to strengthen the objective and scientific basis of the management process, to minimize the subjective factors (Formula 1):

$$\text{Oregl.} = \frac{Nr.\,p.}{No.\,p.}, \tag{1}$$

where: Oregl.– coefficient of management processes regulation;

Nr.p. – the number of regulated management procedures (operations) that are fixed in organizational documents and to which routing or operational technologies are conducted;

No.p.– total number of procedures (operations).

It should be emphasized that for the quantitative determination of *Nr*.p. and *No*.p., it is necessary to limit the time, depending on the quantity and hard of the work, which makes it possible to determine the number of such procedures (operations), performed in the managerial activities of the enterprise, departments, in general, is practically impossible.

Regulatory activity of management processes should make conditions, which interim enterprise results reliably ensure its final results, in the management system.

2. The coefficient of management process norm setting – Onorm., characterizes the state of the norm setting of managerial work in certain production conditions (Formula 2):

$$\text{Onorm.} = \frac{Pn.t}{Po.t}, \tag{2}$$

where: Onorm. – the coefficient of management process normalization

Pn.t. – labor intensity of normed managerial works, thousand. Person- P.

Po.t. – the total labor intensity of all managerial work, thousand. Person- P.

Quantitative determination of Pn.t. and Po.t. is realized by the analogy with the definition of No.p. and Np.p. mentioned above.

Rational organization of the management process is possible with good scientifically- based norm setting. Therefore, the more normed managerial works, the management process will be better in other equal conditions organized.

3. The coefficient of providing the recommended practices – Oi.m., characterizes the availability of recommended practices (regulations on the producing departments, duty regulations). The availability and qualitative content of recommended practices, above all, ensures the rational differentiation of labor between specialists in the management process. Availability and use of recommended practices has a significant influence on many aspects of the work of the enterprise (Formula 3):

$$\text{Oi. m.} = 0{,}5\frac{Dp}{D} + 0{,}5\frac{Pp}{P}, \tag{3}$$

where: Oi.m. – the coefficient of providing the recommended practices

Dp. – the number of posts for which the practices are planned;

D – total number of posts in the management system;

Pp. – number of structural departments, for which the practices has been planned;

P – total number of structural departments;

The recommended practices play a great role in the scientific organization of managerial work, and they are necessary organizational base for quantitative evaluation of labor efficiency.

4. The coverage coefficient of structural departments with the labor quality management system – Ok., characterizes the presence of responsibility, adherence of the principle of inevitability and immediacy of punishment and stimulation. In modern conditions, the full expression of this principle takes on special significance (Formula 4):

$$Ok. = \frac{Pk.}{P}, \tag{4}$$

where: Ok. – coverage coefficient of structural departments with the labor quality management system;

Pk. – number of structural departments covered with the labor quality management system;

P – total number of structural departments.

Like above presented procedure, it is possible to propose the evaluation procedure of **information cycle** as the most important technological component of the management process reengineering, allowing us to estimate comprehensively the information support and identify its bottlenecks.

This group can include evaluation analysis indicators of information cycle of management process reengineering, that characterize: the indicators of the information process course in the context of compliance of standard data (calculation or expert data) with factual data; the variance of actual data from planned standards; evaluation of average information work load; number of documents per employee; the level of information use (information capacity); the level of rational (effective) use of information materials; the level of information stability; use information for performing management functions, use information to enlarge the professional erudition of the employee.

I. It is possible to characterize the course of the information process with the help of indicators, from the point of view of compliance of standard data with factual data.

1.1. The level of the information process course by time factor – (Up.), can be analyzed on the basis of an aggregated evaluation following the next formula (1.1):

$$Up. = \frac{\sum_{i}^{n} = 1Fi}{\sum_{i}^{n} = 1Pi}, \tag{5}$$

where: Up .– level of the information process course by time factor;

Fi – the actual state of the information process course;

P – standards of the information process course;

i = 1,2,3, ... p; p = 5;

i = 1 – the stage of collection and registration of source information;

i = 2 – the stage of information transfer;

i = 3 – the stage of information transformation or processing;

i = 4 – the stage of information output and copying;

i = 5 – the stage of using information in the form of influence.

1.2. The variance of actual data from planned standards (Ip.) is calculated as follows (Formula 6):

$$Ip. = \sum_{i=1}^{n} Pi - \sum_{i=1}^{n} Fi, \tag{6}$$

where: Ip. – variance of actual data from planned standards;

Fi – the actual state of the information process course;

Pi – standards of the information process course;

i = 1,2,3, ... p; p = 5;

i = 1 – the stage of collection and registration of source information;

i = 2 – the stage of information transfer;

i = 3 – the stage of information transformation or processing;

i = 4 – the stage of information output and copying;

i = 5 – the stage of using information in the form of influence.

2. The average information load of an employee can be evaluated from the following indicators.

2.1. The level of information capacity (Ui.z.) of one employee (Formula 7):

$$\text{Ui. z.} = \frac{\text{Ef.}}{\text{En.}}, \tag{7}$$

where: Ui.z. – level of information capacity;

Ef. – capacity per bit / sec. of an employee;

En. – planned capacity per bit / sec. of an employee

2.2. Number of documents (Kd.) per employee (Formula 8)

$$\text{Kd.} = \frac{\text{Eo.}}{\text{Ru.}}, \tag{8}$$

where: Kd. – the number of documents per employee (pcs) in this management function;

Eo. – the number of incoming and outgoing documents for a certain period;

Ru. – the average number of employees in this management function;

III. The level of information use – Ui.i. (Information capacity) is calculated as follows:

$$\text{Ui. i.} = \frac{\text{Ki.}}{\text{Kn.}}, \tag{9}$$

where: U.i.i. – the level of information use (information capacity);

Ki. – the number of information messages used for a certain period (decade, month, quarter, year);

Kn. – the total number of messages received for the same period.

IV. The level of rational (effective) use of information materials – U.i.i. is defined as follows:

$$\text{Ui. i.} = \frac{\text{Ei.}}{\text{Eost.}}, \tag{10}$$

where: U.i.i. – the level of rational (effective) use of information materials;

Ei.– the capacity of information materials used (the number of documents, figures) for a certain period (decade, months, quarter, year);

Eost. – the balance of unused materials for the same period.

V. The level of information stability – U.s.i., is calculated as follows:

$$\text{Us. i.} = \frac{\text{Ko.} - \text{Ki.}}{\text{Ko.}}, \tag{11}$$

where: Us.i.– level of information stability;

Ko. – the total number of documents in the management operation;

Ki. – the number of documents in the management operation that have changed in content.

VI. The level of consumptive use of information can be evaluated in two aspects.

5.1. Information use for performing management function – Up.i.f.:

$$\text{Up.i. f.} = \frac{\text{Kv.f.}}{\text{Ko. i.}}, \tag{12}$$

where: Up.i.f. –the level of consumptive use of information for performing management function;

Kv.f. – the number of information messages required to the employee for performing management function;

Ko.i. – the total number of information messages, an employee received for the same period.

5.2. The use of information to enlarge the professional erudition of the employee – Up.i.e:

$$Up.i.e. = \frac{Ke.r.}{Ko.d.}, \quad (13)$$

where: Up.i.e – the level of consumptive use of information for enlargement the professional erudition of the employee;

Ke.r. – the number of documents that enlarge the professional erudition of the employee, performing the management function;

Ko.d. – the number of documents, the employee received, performing the management function.

Like above presented procedure, it is possible to propose the procedure of cycle evaluation of **managerial decisions** as the most important technological component of the management process reengineering, allowing us to estimate the managerial decisions and identify their bottlenecks.

This group can include cycle evaluation analysis indicators of managerial decisions of management process reengineering, characterizing: the management cycle duration of decision preparation and implementation; the technological cycle duration of the decision implementation process; an indicator of the management body's work plan implementation on the management decisions preparation, acceptance and implementation; characterizing the part of decisions actually implemented on time in the content plan; characterizing the substantial state of the qualitative implementation of decision; the indicator that characterizes the part of decisions taken repeatedly in the content plan.

1.The management cycle duration of decision preparation and implementation – Rts.r., characterizes in the content plan the duration of decision preparation and implementation in the management cycle:

$$\mathbf{Rts.r.= Tp.ts. + Tp.ts.,} \quad (14)$$

where: Rts.r.– the management cycle duration of decision preparation and implementation

Tp.ts. – the duration of the decision preparation (minutes, hours);

Tp.ts. – the duration of decision implementation in the management cycle (minutes, hours).

2. The technological cycle duration of the decision implementation process – Rts.t., characterizes in the content plan the duration of the technological cycle as the sum of time of all operations:

$$\mathbf{Rts.t. = \Sigma t} \quad (15)$$

where: Rts.t..– the technological cycle duration of the decision implementation process;

Σt– the technological cycle duration as the sum of time of all operations.

3. The indicator of the management body's work plan implementation on the management decisions preparation, acceptance and implementation – Rvyp.pl., characterizes the degree of work plan implementation (n– h) by the management body for the preparation, acceptance and implementation of the decision:

$$Rvyp.pl. = \frac{Rfact.}{Rpl.}, \quad (16)$$

where: Rvyp.pl.– the indicator of the management body's work plan implementation on the management decisions preparation, acceptance and implementation;

Rfact. – actual work indicator on the management decisions preparation, acceptance and implementation.

Rpl. – planned work indicator on the management decisions preparation, acceptance and implementation;

4. The performance indicator of the decisions implementation by supreme management body – Risp., characterizes the part of decisions in the content plan actually completed on time:

$$Risp. = \frac{Rfak.i}{Rp.i.}, \quad (17)$$

where: Risp. – the performance indicator of the decisions implementation by supreme management body;

Rp.i. – decisions to be implemented;

Rfak.i – actually implemented decisions.

5. The quality indicator of management decisions implementation – Rkv.r., characterizes the content state of the qualitative implementation of the decision:

$$Rkv.r. = \frac{Rk.v.r.}{Rk.p.r.}, \tag{18}$$

where: Rkv.r. – quality indicator of management decisions execution;

Rk.v.r. – number of taken decisions;

Rk.p.r. – number of implemented decisions.

6. The repetition indicator of implemented decisions – Rpovt.r., characterizes the part of decisions taken repeatedly in the content plan:

$$Rpovt.r. = \frac{Rk.p.p.r.}{Rv.k.r.}, \tag{19}$$

where: Rpovt.r. – repetition coefficient of implemented decisions;

Rk.p.p.r. – number of re-accepted decisions

Rv.k.r.– total number of decisions;

5. Discussion

Our research confirmed the practicability of the presented procedure on the implementation of management processes reengineering at the enterprise and our expectations of the effectiveness, the algorithm presented below, for the state evaluation of the management cycle of management processes reengineering, which with this approach, it is advisable to perform in several stages (Table 1).

At the first stage, it is necessary to find out what is the reason for the need to state evaluation of the management cycles, why it is necessary to identify the possibility of getting the source data (statistical, accounting, operational, etc.) or the need to plan a special study, analyzing each aspect of the enterprise's activity.

At the second stage, the ordinary calculation of the numeric value of these indicators is performed using all necessary information.

At the third stage, a consolidated indicator is determined on the basis of the acquired particular indicators.

At the fourth stage, the development of certain activities is carried out, on the basis of the acquired consolidated value, which should ensure the compliance of the management cycle with the scientific– based level.

Table 1

The algorithm of state evaluation of the management process

The stages of state evaluation of the management process	**Conducting operations**
1.Determination of necessity, possibility and practicability of the use of the procedure	1.1 The analysis of each aspect of the enterprise's activities 1.2 Determination of having the source data: a) statistical b) accounting c) operational d) research, etc.
2. The calculation of numeric values of particular indicators	2.1 Control of information completeness required for the calculation

	2.2 Calculation of numeric values
3. Determination of numeric values of particular indicators	3.1 Selection of numeric values of all particular indicators, which are necessary for the calculation of consolidated indicators. 3.2 Calculation of the consolidated indicator
4. Use of the data acquired for the development of certain activities	4.1 Development of necessary activities

A distinctive feature of the proposed procedure is that:

– Firstly, after determining the above presented indicators, such procedure allows to compare the values acquired with the standard (or base values), and also allows to determine what organizational measures necessary to develop, as they can be the basis for management processes reengineering;

– Secondly, it mainly considers and complies with the above mentioned the most essential principles, to which the methods of quantitative state evaluation of the management processes should satisfy.

The proposed state evaluation procedure of management cycles, as noted, characterizes the substantial state of the management process, which represents the idea of this approach.

It should also be noted that the state of all management cycles of the management process depends on many elements of the management system and it is in interrelation with them. State changing of any one of the elements of the management system leads to certain changes, as management cycles, as the state of management process. Therefore, studying the management processes and choosing the ways to improve it, especially the management processes reengineering, it is necessary to consider the management process in relation to all management elements.

A holistic analysis of management processes needs to identify the indicators that have been on a low level during a number of years, to identify the causes and plan measures to improve them. For clarity, the results of the analysis should be shown on a graph: it will provide a fairly accurate picture of the proposed state of the management process and indicate the direction of certain activities.

6. Conclusions

Thus, the proposed procedure allows using identified indicators to determine the status and trends of management cycles and, accordingly, the effectiveness of management process reengineering, the reserves of its improvement and the degree of implementation aimed at these activities. Moreover, a distinctive feature of this procedure is that like state evaluation procedure of management cycles, the evaluation of other technological components of management process reengineering can be presented using particular indicators of their evaluation. Therefore, at the present stage, the proposed methodological approach to state evaluation of management cycles of enterprise management processes reengineering can be of particular practical importance. And the key role plays here the intensification indicators of management processes and the use of working time, which are of particular importance in the system of indicators of economic efficiency not only of enterprise, but also of management, which is very important for the real prospect and wider use in economic science and practice.

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