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FORMATION OF THE ORGANIZATION MANAGEMENT SPACE MODEL

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INTRODUCTION

To ground the purpose of management, it is necessary to note the composition of the management system, the main features of the subsystems and what they lack to achieve the goal of the system. The system includes two main parts (subsystems): the control object and the subject (body) of management. The object is endowed with the basic material factors (resources), the use of which makes it possible to achieve the goal system. However, the object has an formidable obstacle for it, namely, the uncertainty about how to use these factors which would ensure that the system achieves the goal, that is, the uncertainty of the behavior of the object. So, if this uncertainty is not eliminated or, at least, significantly reduced, the available resources and factors of the object cannot be effectively used, therefore, the goal of the system cannot be achieved. And if the goal is unattainable, then the existence of such a system does not make sense. It turns out that the elimination or the maximum possible reduction in the uncertainty of the object’s behavior is a mandatory procedure. To perform this mandatory function, a management body is provided in the management system. The main purpose of the subject of management is to eliminate the uncertainty of the behavior of the object on its path to achieving the goal.

The goal can be achieved only through specific actions of the object. In every situation and at every moment in time, there are many possible actions in front of the object, but only one (or several of them) is the one or those that will lead the system to the goal. The object has no information which of them are those. This is the uncertainty of the behavior of the object[1]. Thus, the function of eliminating uncertainty is assigned to the management body. The performance of this function is the main purpose, mission of management body. Let's note, that the management body is a

[1] Клименюк Н.Н., Безус А.Н. Доказательный менеджмент: введение в теорию : монографія. Київ : АМУ, 2015. 272 с.

subsystem designed for informational impact on the control object to achieve a system of goals. And this influence is carried out, mainly due to the elimination of the uncertainty of the behavior of the object. By processing the initial information, the management body receives and transfers to the facility such management decisions that eliminate or at least significantly reduce the uncertainty of its behavior. The implementation of such decisions by the control object ensures the achievement of the goal system.

1. Management process. Control phases

The definition of management changes with the development of science and the views on science of individual researchers. From the point of view of information processing, any control system solves three problems: collecting and transmitting information about the object; information processing; the issuance of management decisions of the management object. We take the following definition as a basis: management is the process of influencing the control object with the goal of its purposeful behavior in the conditions of changing. In the future, this definition will be adjusted, in particular, the content of the process of influencing the object. In the meantime, you should pay attention to the importance of having a goal, since management is aimed at ensuring that it is achieved. A feature of the control process among other processes is that the impact on the object is carried out using information.

The management system, like any system, includes interconnected elements and the mandatory presence of a goal or purpose that it must fulfill. The control system consists of a control object, which, in order to achieve a goal or a necessary state in control actions, and a management body that implements these actions (Fig. 1). The management object includes all those material and human factors that are necessary for the conversion of the subject of labor into a product, that is, for the production of goods and / or the provision of services.

A management body is a subsystem that, based on the initial information and knowledge of the purpose of the system, produces management decisions and transfers them to the object for execution. These decisions are the information impact on the object, which allows you to use the potential of the object to achieve the system’s goal. By analogy with the management object, the management body includes those material and human resources (factors) that are necessary for collecting and processing the initial information into ready-made management decisions and transferring their management object for implementation.

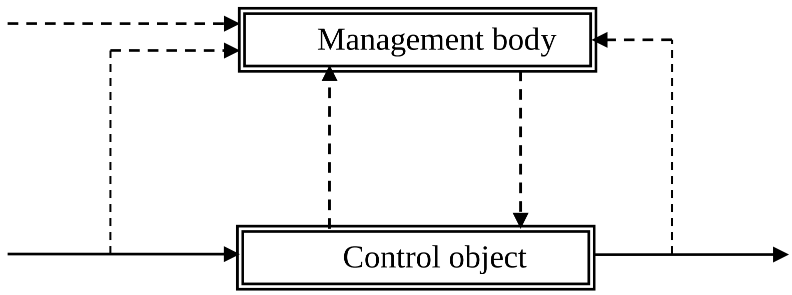

Figure 1. Composition and connections of management system

Depending on the goal or purpose of the system, the management body receives relevant information from the external environment (pointer 1).

In addition to information from the external environment, the management body receives information about the control object itself (pointer 2), and more specifically about its production capabilities, that is, an array of data characterizing the maximum allowable intensity of processes and their results that can be produced per time unit. Production capabilities can be understood as limiting resources, which can include production capacities, material and labor resources, money, time. At the input of the object (pointer 5) come resources from the external environment (material resources, raw materials, energy resources and others) used for production, information on the quality and quantity of which are submitted to the management body (pointer 3).

Production processes taking place in the control object turn labor objects into products (pointer 6). Information on the quantity of products and their parameters is received (pointer 7) to the management body for the development, if necessary, of decisions on the regulation of production and the transfer of their control object (pointer 4). Also, all the input information described above obtained by the management body allows the control entity, based on the purpose of the system and based on performance criteria, to develop a task at each time period, the results of which are transmitted (pointer 4) to the control object for subsequent implementation.

In general, the management process is presented as a process of influencing an object in order to achieve its goal, but there is a need to detail, present and describe it in terms of its individual components, phases.

The initial or zero stage of control, which should be implemented by the first phase, is to establish the purpose of the system. If such a goal has already been set from a higher level of management, it should be perceived as important information for the development of solutions in the first phase of management. Modeling the control process in time allows us to present it with the following sequence of actions (Fig. 2):

Zero stage – setting and formalizing the goal (s) of the managed system (subsystem).

The first phase is planning: determining the desired results of the object's functioning for a given period, which bring it closer to the goal.

The second phase is accounting: obtaining information from the object about the actual results of its activities, for example, the quantity of products for current periods of time that are less than the specified duration, processing and summarizing this information with increasing levels of production units and time periods.

The third phase – control: comparing accounting information about the actual results of the planned activity and calculating deviations.

The fourth phase – adjustment: development of management decisions aimed at eliminating or minimizing deviations identified at the previous stage, and transferring these decisions to the control object for implementation.

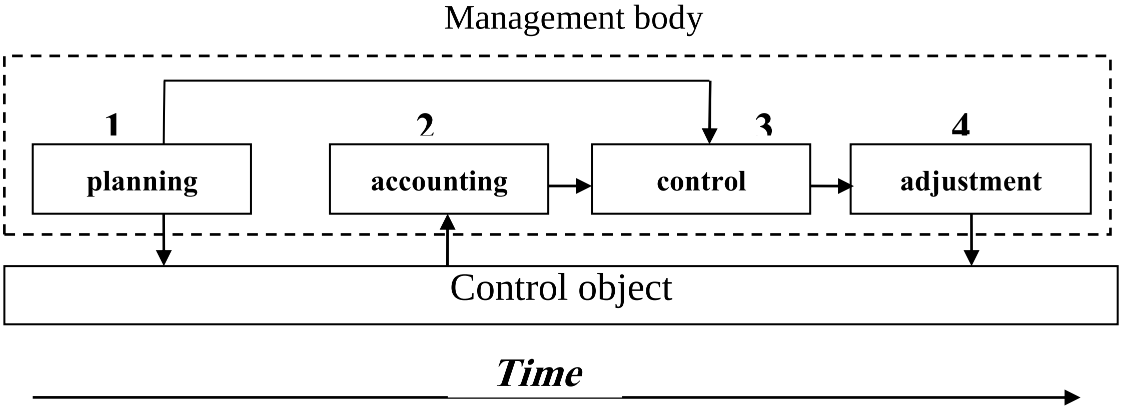

Figure 2. Stages (phases) of a closed cycle of informational relationships of the body and the control object

The object is controlled by the sequential implementation of the presented phases. Each phase represents many management tasks. Some of the management phases presented above, such as planning and control, coincide in name with the management classics listed in the textbooks. But only there they are called management functions. The reader himself has the right to give preference to the concept of "phase" or "function". According to the concept adopted in this work, it is more logical to call each stage of a closed control cycle a phase. If we talk about the functions of the highest level, the function can affect the control object in such a way that it achieves its goals. Of course, this function can expand as the object is disaggregated, processes occurring in it for periods of time for which management decisions are developed.

2. Management space. Defining management tasks

Over the past decades, management theory has been stagnant, despite the significant spread of management – the opening of new universities and specialties, the graduation of specialists, the publication of hundreds, if not thousands, of various books on management. And this despite the great objective need of the real economy in the development of theory, and, consequently, the widespread use of the theory in practice for a significant increase in the efficiency of organizations and the economy as a whole.

Important attention is paid to the description of management functions, such as planning, organization, motivation, control and others. These functions are presented in theory as a subsystem of the entire control system. But for an organization of medium complexity, each of these subsystems is so cumbersome and complex that it is hardly possible and expedient to solve this problem.

Each manager can solve specific management tasks, and not subsystems (functions), which can include hundreds and thousands of tasks. Therefore, the problem of representing these subsystems as a set of control problems remains, which has not yet been done in theory.

If the study and description of management functions is a favorite topic of researchers, then the definition of management tasks can be attributed to problems that authors of modern textbooks and monographs bypass without paying enough attention to them or not mentioning them at all in their works. However, the control task is the main element of the control system[2]. It is the solution of control problems that is the only way for the control system to purposefully influence the control object. In addition, management tasks, their characteristics, quantity and complexity of implementation determine the structure of the management system.

It is advisable to accept the concept of a task in general to the definition of a control problem. We define the tasks as a situation described by known information, which is characterized by some uncertainty, and to eliminate which it is necessary to find some quantities (unknown).

Let us move on to the organization (enterprise) management system. In management theory, there is no well-founded concept of a management problem. This does not mean representing any situation as a specific management task. The point is that the set of these tasks should represent all the many issues that need to be addressed by the control system for successful facility management.

The main problem is to detect many control tasks, which, on the one hand, would be necessary and sufficient for effective management of the facility, and on the other hand, control tasks should not exceed the potential of the corresponding control body in its complexity.

One of the most important principles of building control systems V.M. Glushkov called the principle of a systematic approach, which consists in determining goals and criteria and carrying out structuring, which reveals the whole range of issues that need to be addressed to achieve certain goals[3].

The relevance of the structuring of the control system is confirmed by the fact that, due to complexity, it cannot be fully implemented and, therefore, it is necessary to divide the system into parts, or tasks.

The importance of determining the structure of the control system is emphasized in the works of many authors. The author[4] notes on the structures of control systems: "The first conclusion is recorded by the fact that, dividing the system into subsystems, finding individual blocks (tasks) and developing a project for each of them, we seem to get those "bricks" in finished form, from which then the house of the whole system can be

[2] Каныгин Ю.М., Парфенцева Н.А. Как планировать и оценивать работу ВЦ? *Экономика и организация промышленного производства*. 1983. №3. С. 48–60.

[3] Глушков В.М. Введение в АСУ. Київ : Техніка, 1974. 320 с.

[4] Рыбальский В.И. Об организации проектирования автоматизированных систем планирования и управления строительством. *Кибернетика и вычислительная техника в строительстве*. Київ : Будівельник, 1971. С. 25.

composed. The second conclusion boils down to the fact that when designing individual blocks, you should not miss any significant connections between them."

Carrying out the structuring of the control system is, first of all, the identification of the full set of tasks for managing this object. In turn, the identification of all tasks is a prerequisite for the quality management of the organization. In addition, this is the basis for building the organizational structure of the management system.

The absence of an accepted concept of a control problem makes it advisable to formulate requirements for this process and its results (many tasks):

1. all organizational management tasks, the results of which are required by the object for its effective behavior, must be reflected in the prevailing set (structure);
2. any issue, including the indicator, should be solved only in one task, that is, elimination of duplication;
3. the input to the set of tasks as its elements should not exceed in their complexity the capabilities of the control system for the qualitative and timely implementation of these tasks (receiving, processing information and transmitting decisions of the control object);
4. when forming a set of management tasks, the main connections between them should be reflected, which is aimed at maintaining the integrity of the management system.

Let us analyze on the example of one of the proposed for a manufacturing enterprise the structure of a control system in which the functional part of the system is divided into functional subsystems:[5]

1) planning;
2) technical preparation of production;
3) operational management;
4) accounting;
5) resource management;
6) production management.

Let us consider the proposed functional subsystems in terms of duplication. We denote these subsystems in accordance with S_1, S_2,… S_6. First of all, we exclude from the analysis the subsystem S_2 as such, which

[5] Ляшенко И.Н., Клименюк Н.Н., Калишук Д.А., Килиевич А.И. Моделирование предплановых решений в управлении производством. Київ : Вища школа, 1984. 128 с.

does not apply to the control process, since it is a controlled material process. Let us consider the pairs of subsystems S_1 and S_3. Subsystem S_1 includes planning for all time periods, including those related to operational. Subsystem S_3 includes operational management and, accordingly, the planning phase, namely, operational planning. So, the subsystems S_1 and S_3 have a common part – operational planning: $S_1 \cap S_3$ = operational planning. Subsystems S_1 and S_4 do not have common elements, that is, $S_1 \cap S_4 = \varnothing$ (their section is an empty score). Subsystems S_1 and S_5 intersect in the "resource planning" part: $S_1 \cap S_5$ = resource planning. This is explained by the fact that S_1 (planning) covers all processes in the organization, including the provision of resources, and S_5 includes planning (as a control phase) of resources, that is, $S_1 \cap S_5$ = resource planning. Similarly, S_1 intersects with S_6 in terms of "production planning": $S_1 \cap S_6$ = production planning.

The intersection of other subsystems is presented without explanation:

$S_3 \cap S_4$ = operational accounting;

$S_3 \cap S_5$= operational resource management;

$S_3 \cap S_6$= operational management of production;

$S_4 \cap S_5$= accounting of resources;

$S_4 \cap S_6$ = production accounting;

$S_5 \cap S_6 = \varnothing$ (no intersections).

This analysis revealed significant drawbacks in the construction of structures due to the large number of intersections of the proposed subsystems. The result of such intersections will be the duplication of solutions to the same questions and the receipt of ambiguous answers that are difficult to use for the management object.

The proposed functional subsystems are parts of the entire system and their selection should be carried out according to certain criteria.

The "planning" subsystem S_1 is highlighted by the "control phase" attribute, S_3 (operational control) by the time attribute; S_4 (accounting) – according to the control phase; S_5 (resource management) and S_6 (production management) – by type of controlled process.

Any control system is so complex both algorithmically and informationally that it requires its distribution into parts (blocks). We denote the control system by S, and the blocks (subsystems) into which it will be divided – S_1, S_2 …, S_m. Each of these blocks is simpler than the S system, however, if they are too voluminous and complex, then each of them must again be divided into parts. It is advisable to continue the distribution process until we get blocks whose capacity and complexity does not exceed a given one, that is, one that the control body is able to overcome in the required time. The blocks (parts) of the control system obtained at this level should be called control tasks. Then the parts of the system obtained at higher levels will be complexes of tasks or subsystems.

The most important requirement that must be observed during decomposition is that the distribution of the system (or subsystems) at each level should be carried out on one basis.

Consider some manufacturing enterprise. We will understand production activity in the broad sense, referring to it the provision of services. This clause allows you to include any organization. For the effective functioning of this organization there is a management system (governing body), which is designed to manage all activities. In other words, the governing body needs to solve the problem of "managing the activities of the organization.» Due to the extreme algorithmic and computational complexity of this task-system, it should be divided into separate subsystems.

Let us assume that the enterprise includes 10 production workshops, and each of them consists of 5 production sites (Fig. 3). The structure of the enterprise includes only those departments where production processes take place (for example). Each of the units represented in the diagram is directly involved in the production process, at one stage or another of the conversion of the subject of labor into finished products.

We list the main production processes characteristic of any enterprise. The main one is the production process. For the course of which the following processes are necessary: provision of production with materials (objects of labor); providing production with energy resources; provision of production with fixed assets; staff production.

So, we have an enterprise for which it is necessary to identify a list of management tasks. We apply the decomposition method for this.

We denote the control system, that is, the full range of control tasks, by S. Denoting the signs of decomposition by i, we select the first sign (i=1).

As the 1st sign, we take the **form of a controlled process**. Let us imagine the structure of the controlled processes of this enterprise (Fig. 4). Let k be the number of the controlled process. For a simulated enterprise, such processes will be: k = 0 – production; k =1 – ensuring the production of raw materials, semi-finished products; k = 2 – ensuring the production of energy resources; k = 3 – ensuring the production of fixed assets; k = 4 – ensuring production personnel.

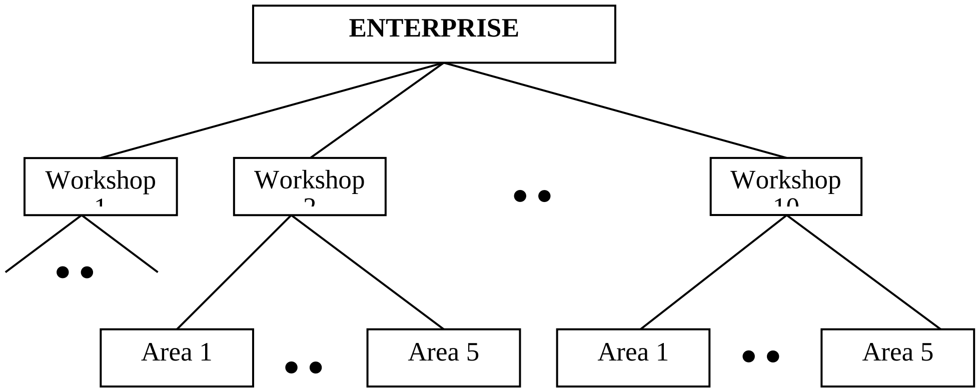

Figure 3. The production structure of the simulated enterprise

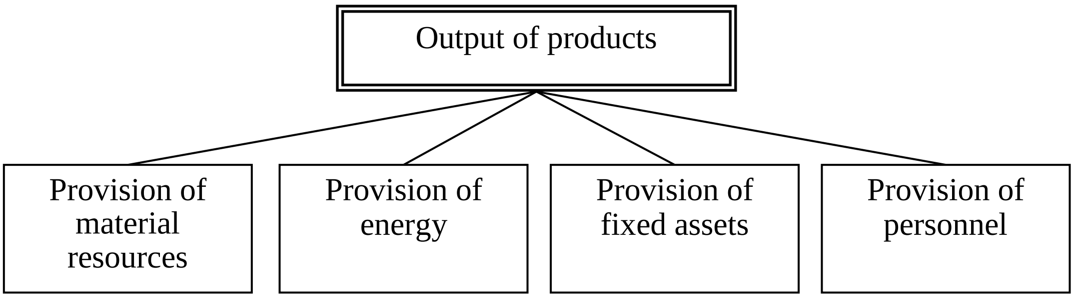

Figure 4. The structure of production processes of the enterprise.

At the first sign, we divide the control system S into subsystems:

$$S = \{ S_0, S_1, S_2, S_3, S_4\} = \{ S_k, k = 0, 1, 2, 3, 4 \text{ or } k = \overline{0,4} \},$$

$$S = \{ S_k, k = \overline{0,K} \}. \qquad (1)$$

That is, S_k is the control subsystem of the k-th process, it consists of subsystems, for exampleд: S_0 – production control; S_4 – personnel support subsystem. The resulting subsystems cannot have common elements. That is, they should not intersect:

$$\bigcap_{k=0}^{4} S_k = \varnothing \qquad (2)$$

And the number of subsystems received is:

$$M_1\ (S) = 5. \tag{3}$$

Each of the obtained control subsystems requires further division into parts.

To do this, for the second sign of decomposition ($i = 2$) *we take the* ***production structure****. According to this sign, each process control subsystem will decompose into a number of parts equal to the number of divisions of a given enterprise. We denote:* l *– number (index) of the production unit. Taking the production structure shown in fig. 3, we denote:* l **=** 0 – *enterprise; l* **=** *1 – workshop* 1*; l* = 2 **–** *workshop* 2*;* …; *l* =11 – section № 1 of workshop 1; …; ***l*** **=** 60 – section № 5 of workshop 10.

The *k* process control subsystem S_k *will* be divided into 61 parts:

$$S_k = \{\ S_{kl},\ l = \overline{0,60}\ \},\ k = \overline{0,4}\,. \tag{4}$$

We got control subsystems of the *k*-th process in the *l*-th production unit. We substitute specific processes and divisions instead of the indices *k* and *l*:

S_{01} – production management ($k = 0$) in the workshop *l* (l **=** 1);

S_{10} – management of production support materials ($k = 1$) for the enterprise (l = 0);

$S_{4,12}$ – management of production support for personnel ($k = 4$) in area 2 of the workshop 1.

As with the distribution of the system for the 1st sign, intersections of subsystems are also unacceptable here:

$$\bigcap_{l=0}^{60} S_{kl} = \varnothing,\ k = \overline{0,4} \tag{5}$$

It is easy to calculate the number of control subsystems obtained after the distribution of the system according to two criteria:

$$M_2\ (S) = 5*61 = 305. \tag{6}$$

In order to reduce the algorithmic and computational complexity of the formed subsystems, we take the following, third sign of decomposition, i = 3, **the control phase,** which we denote by *p*. Using the structure of the management process we take: $p = 0$ – management (as a generalizing and coordinating process); p $=1$ – planning; p = 2 – accounting; p = 3 – control; p = 4 – regulation.

According to the control phase, each of the S_{kl} subsystems is divided in this way:

$$S_{kl} = \{S_{klp},\ p=\overline{0,4}\},k=\overline{0,4};l=\overline{0,60}, \tag{7}$$

where S_{klp} – management of the k – th process by unit l by phase p.

Taking specific values for k, l and p, as a fragment of the resulting structure, we will present: S_{243} – control (p = 3) ensuring production of energy resources (k = 2) in workshop 4 (l = 4). All subsystems formed by three signs should not have common elements (intersections):

$$\bigcap_{p=0}^{4} S_{klp} = \varnothing,\ k=\overline{0,4};\ l=\overline{0,60} \tag{8}$$

Let us determine the number of control subsystems obtained as a result of decomposition according to three criteria: $M_3(S) = M_2(S)*\ 5= 305*\ 5 = 1525$, where 305 – is the number of subsystems by distribution according to two preliminary signs; 5 – the number of control phases, including the generalizing phase – control.

To simplify the obtained tasks, we introduce the fourth sign of decomposition i =4. As this feature, we take the **time period (control interval)**, which we denote by t. By management interval, we understand the duration of the period for which it is necessary to make management decisions. These periods have different durations, and they should all be displayed in the appropriate structure. Duration of periods may be five years, year, day, shift. The structure of the management period for different organizations may vary, but among them there are mandatory periods such as a year, quarter, month, only just because organizations have certain information obligations to the state. To simplify, we will accept the structure of the management period for the enterprise under study, the largest interval of which is a year, a year is divided into quarters, quarters, months, a month into decades, decades into days.

Continuing the distribution of each of the obtained S_{klp} subsystems according to the 4th criterion, we obtain:

$$S_{klp} = \{S_{klpt},\ t=\overline{0,412}\},k=\overline{0,4};l=\overline{0,60};p=\overline{0,4}, \tag{9}$$

where S_{klpt} – *process control k* in unit l by phase p for the period *t.*

Substituting the specific values of the listed parameters *k, l, p, t,* we present a fragment of the set obtained as a result of decomposition according to four features of the problems:

S_{0214} – planning *(p* = 1) of production (*k* = 0) of workshop 2 (*l* = 2) for the 4th quarter (*t* = 4);

S_{1925} – accounting for the production of materials of workshop 9 for the 1st month of the 1st quarter (January);

$S_{2,\ 11,\ 3,\ 412}$ – control (3) of ensuring the production of energy resources (2) to section 1 of workshop 1 (11) for December 30 (i.e., the 10th day of the 3rd decade of the 3rd month of the 4th quarter) (412).

In accordance with the requirements for the structure of the management system, the formed tasks should not allow duplication, i.e.:

$$\bigcap_{t=0}^{412} S_{klpt} = \varnothing,\ k = \overline{0,4};\ l = \overline{0,60};\ p = \overline{0,4} \qquad (10)$$

The number of received parts of the control system as a result of its distribution according to 4 signs: M_4 (*S*)= 1525*413 = 629825, where 413 – is the number of time periods in the accepted structure.

To assess the complexity of the obtained parts of the system, we note that each of them includes one controlled process occurring in one production unit, one control phase and one-time period. Therefore, it can be noted that their complexity does not exceed the capabilities of managers. So, the further distribution of the system is impractical, and after the decomposition can be called each received part as management task.

Depending on the specific goals of the control system, from their entire set of received tasks, any of their complexes and control subsystems can be formed.

As well as decompositions, the integration of control tasks into subsystems must be carried out according to characteristics. *For example*, on the basis of the “production uni” management tasks can be reduced to the subsystem “Planning for the production of material resources for all production units for the 1st quarter”.

At the same time, groups of tasks can be distinguished depending on the main type of activity of the analyzed unit of the enterprise, *for example*:

for the planning department, we can consider the combination of management tasks by all indications, except for the management phases, while highlighting only one of them – planning, as a result we get the subsystem “planning of production processes for various departments of the enterprise and time periods”;

for the human resources department – by all indications, except for a controlled process, namely, ensuring production by personnel, as a result we get the subsystem “planning for production support by personnel for all departments of the enterprise for all periods”;

similarly, you can create a subsystem for the department of the chief power engineer – only a controlled process here can be the provision of energy production, then we will get the subsystem “management of the production of energy resources for all production divisions and time periods”.

Management objectives can be combined with two or three attributes.

For example, on the grounds of “production unit” and “time period”, the complex “production accounting” can be called (meaning the consideration in this complex of all production units and time periods).

Combining tasks into complexes can be carried out on three grounds simultaneously.

For example, a set of tasks “managing the provision of production with material resources for all production units of the enterprise, and time periods” is synthesized from the corresponding management tasks according to the characteristics: control phase, production units and time period.

Thus, the implementation of the decomposition algorithm of the enterprise management system using the example under consideration allows us to obtain a complete set of tasks.

Let u recall that each control task is associated with the search for unknowns according to the four signs of decomposition listed above, namely, **a controlled process, a production unit, a control phase, a time period**.

Hence the name of the control task consists of listing these features in this sequence:

control phase → controlled process → production unit → time period.

This rule allows us to standardize the names of tasks, make their interpretation unambiguous and get their complete list. We bring it to table 1.

Using the form of the table below, it is easy to compile a complete list of management tasks of any organization.

If we talk about the organization considered in the example, then you need to refer to the given directories (structures), namely: control phases; managed processes; production units and time periods.

Substituting specific values from these directories into the table in the corresponding columns of the table, we obtain the name of the corresponding task.

Table 1

Formation of a list of tasks for managing an organization using the decomposition method (fragment)

№ S. No.	Sign of decomposition of the control system			
	1. Control phase	2. Controlled process	3. Production unit	4. Time period
1.	Planning	production of goods	in workshop № 1	for the 2nd quarter
2.	Accounting	Providing energy	by enterprise	for the third decade of the 1st month
3.	Regulation	provision of production with materials	on the 2nd section of workshop 10	on the 2nd month
…	…	…	…	…

To make a complete list of tasks, it is necessary to add all the elements from each directory to the table in turn.

The presented method of decomposition of the control system made it possible to obtain a complete list of control tasks. Each task contains four parameters – one from each structure formed by the corresponding signs of decomposition. We represent each feature as some coordinate axis.

Let the first axis be “controlled process”.

Then, being attached to the organization considered in an example, we will present this here (fig. 5).

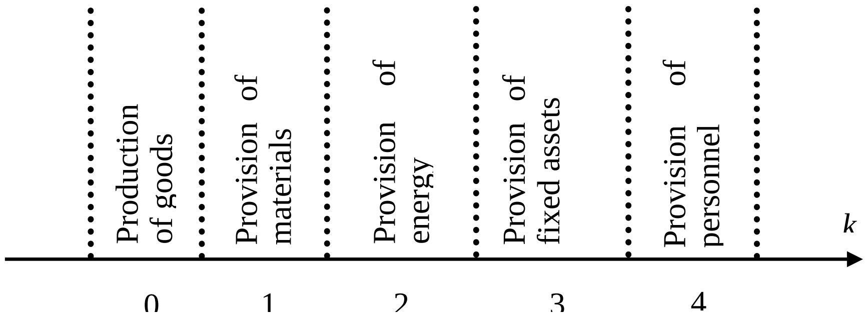

Figure 5. Parameters of the axis “controlled process”

Any control problem includes only one coordinate of this axis, i.e., any process k from the score: $k\ \overline{0,4}$.

Each process takes place in the production units of the organization. Let us represent the production structure as the second coordinate axis (Fig. 6).

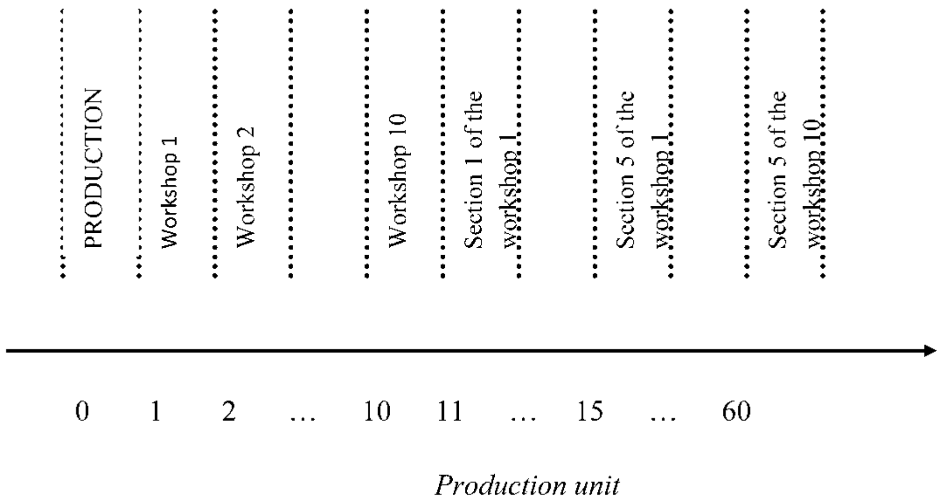

Figure 6. Coordinates of the axis “Production structure” (for example, the organization considered above)

Given two coordinate axes, the control task includes one coordinate of the first axis and one coordinate of the second. The task can display any subdivision l from the given score: $l \in \left(\overline{0,60}\right)$.

As the third sign of decomposition, the control phase was accepted. We accept it as the third coordinate axis (Fig. 7).

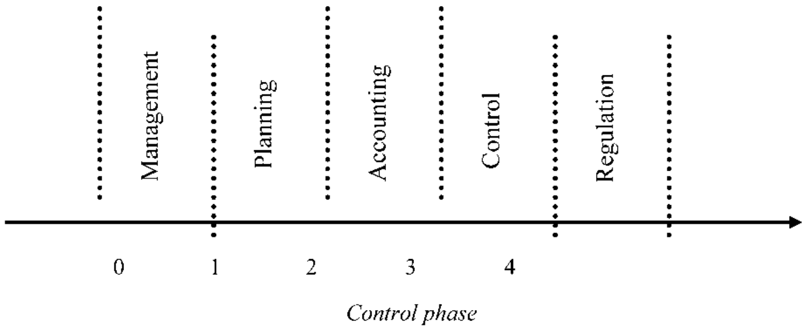

Figure 7. Coordinate axis “control phase”

One of the total number of control phases represented on this axis is reflected by each control task: the p phase is an element of this set – $p \in (\overline{0,4})$.

If $p=0$ (control), then we have in mind the management process that performs a coordinating role in all other phases of management.

We take time as the fourth coordinate axis. When solving control problems, time is usually represented as discrete periods. The structure of the time period adopted in the control system decomposition example is represented on this coordinate axis (Fig. 8).

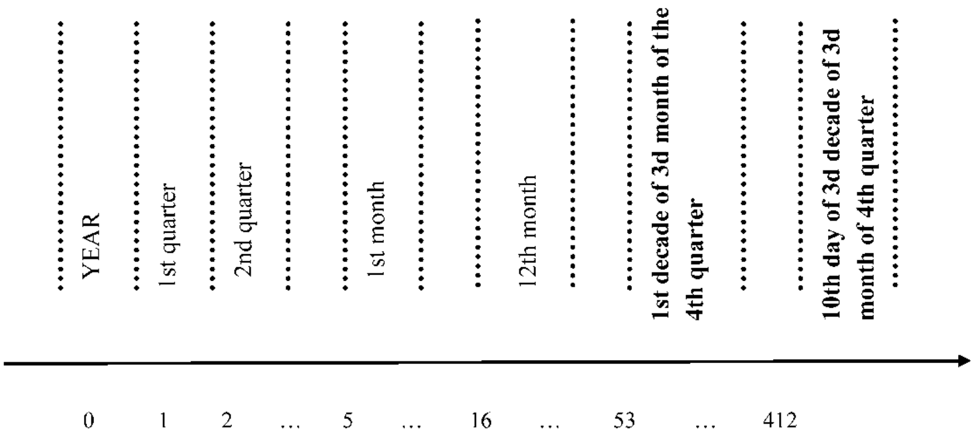

Figure 8. The coordinates of the axis “control period (time)”

The presented coordinate axes allow you to describe the organization control space. This means that any management task is located in this space. The four coordinate axes are described above, therefore, we are talking about four-dimensional space. Each control task has specific coordinates that determine its exact position in the control space.

We denote the control problem by S_{klpt}, where the indices k, l, p, t represent, respectively, the coordinates of the above axes.

The task coordinates determine not only its position in the management space of a given organization, but also its purpose. *For example*, substituting the specific coordinates of the problem, let $k = 3$; $l = 2$; p = 1; $t = 5$, we get task S_{3215}, the content of which is to develop a plan (p=1) to ensure production of fixed assets *(k = 3)* in workshop № 2 *(l = 2)* for the 1st month *(t = 5).*

The coordinates presented above (Fig. 5-8) correspond to the organization considered in the example. For this organization, a **management space** can be represented:

$$\{ k = \overline{0,4}; l = \overline{0,60}; p = \overline{0,4}; t = \overline{0,412} \}.$$

To describe the management space in a general way, that is, for any organization (enterprise) in which the processes of production of goods or the provision of services take place, there are some departments where these processes take place and they need to be managed, and these management decisions are necessary for different periods time, take:

k – number of the controlled process, their number in the organization $K + 1$, that is, $k = 0, 1, \ldots, K$ (since the process numbering starts at 0, the last number is K);

l – production unit number, their numbering $l = 0,1,\ldots, L$;

p – control phase number, $p = 0, 1, \ldots, P$;

t – period number, $t = 0, 1, \ldots, T$.

In the general case, the management space for any organization is:

$$\{ k = \overline{0,K}; l = \overline{0,L}; p = \overline{0,P}; t = \overline{0,T} \}. \qquad (11)$$

The presented model of the control space is a kind of “portrait”, a reflection of a real existing organization and its management system. And the organization functions and develops, its parameters change, which, of course, should be reflected in the model of the management space. There is no reason to believe that these changes will lead to a change in the structure of the model, for example, to a change in the coordinate axes. But a change in the coordinates along each of the axes can take place to comply with the adequacy of the model to a real system.

In real dynamic systems, changes can occur along each axis.

Indeed, it is quite natural to change the organization's production structure so that it meets the changing goals and conditions of the organization.

The structure of the time period also cannot remain constant, since it should contribute to obtaining sufficiently reliable managerial decisions in stochastic conditions during the transition from one period to another.

A feature of the presented model of the control space is that it is discrete, since the coordinates along all axes are discrete.

The described management space is the "place" where all the management tasks of this organization are located. Each task has four coordinates. Despite the fact that each task is a complex aggregate, we consider the problem here as a unit cell of a given space.

The description of the control space makes it possible to define the control problem as part of this space.

CONCLUSIONS

The elimination of the uncertainty of the object's behavior on the way to solving its main tasks is the main purpose of the control subject. A system requires control when uncertainty is inherent in it. Management itself is designed to eliminate or at least reduce this uncertainty, which opens the way for the system to achieve the goal.

Management is the set of management tasks and the relationships between them and the external environment. It is the solution of control problems that represents finding unknown quantities that eliminate (reduce) the uncertainty in the behavior of the system. Each task eliminates the uncertainty of the corresponding share of the system, and all their set – the entire organization as an object of management.

From this we can conclude that the achievement of the organization's goal lies on the path to eliminating the uncertainty in its behavior, which, in turn, is achieved by solving management problems.

But for this, at a minimum, it is necessary, firstly, to identify the entire set of tasks aimed at reducing uncertainty in the organization's behavior, and secondly, to determine unknown quantities, the finding of which will eliminate the existing uncertainty in the process of functioning.

The purpose of the management body is to eliminate this uncertainty, which should be based on the theoretical provisions of management. Due to the lack of such a theoretical base, an approach is proposed that provides the classification and ordering of many unknown variables by constructing a control space model. It is hoped, that the stated principles of the theory will be sufficient for the thoughtful reader to pose and solve practical issues of managing the functioning of the organization.

SUMMARY

The description of the control space makes it possible to define the control task as part of this space. The control task is a single cell of the control space, which is characterized by a set of internal and external data, which requires liquidation of the uncertainty of finding information (unknown values) that relates to a given fraction of this space.

From the definition it follows that to solve a specific problem, source information can be used on any other cells of this space (that is, other tasks) and with an external to the organization environment, and the results of solving the problem relate to this corresponding cell in the control space.

The identification of the full set of organization management tasks, regardless of its structure, goals, products and services provided, is the main condition for the formulation and solution of practical issues of organization management. Even with a huge variety and differences between organization management tasks, regardless of management processes, production structure, phases and duration of management periods, the reader will find practically useful recommendations for each task and an approach to its formulation and implementation.

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