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ANALYSIS OF THE EFFECTIVENESS AND EFFICIENCY OF MANAGEMENT SYSTEMS BASED ON SYSTEM ANALYSIS METHODOLOGY

Abstract: *In this paper we consider the problem of analyzing the effectiveness and efficiency of management systems that are relevant, especially in the implementation at the enterprise requirements of ISO 9001, 14001 and others. Research management system based on a systematic approach focused on the disclosure of its integrative qualities (i.e. systemic), on identifying the variety of relationships and mechanisms for these qualities. It allows to identify the causes of the real state of affairs, to explain the successes and failures. An important aspect of a systematic approach to the analysis of the effectiveness and efficiency of production control management is the multiplicity of "stakeholders" interests involved in the production process in the formation of operational goals and ways to achieve them.*

Keywords: *System analysis, problem, problematika, goals, Stakeholders, resources*

1. Introduction

One of the most important tasks in ensuring the effectiveness of controls in management systems is a thorough analysis of the processes and effectiveness of the entire management system, identifying the causes of deviations and discrepancies, establishing causal relationships in the system. Without knowledge and understanding of all these factors is impossible to solve the key management system tasks: assessment of processes and systems to identify the causes of such a state, and most importantly in this three-pronged problem, the formation of managerial decisions.

Without this knowledge, it is impossible to assess the rationality of resource costs to achieve the objectives, i.e. eventually - the effectiveness of processes and the whole system. Top management analysis of the system, based only on an assessment of goals, does not allow in full to ensure effective management. This is due to the fact that the goal achieveddoes not characterize the ways and methods that contributed to this achievement and, consequently, current management practices may not achieve the goal for another time. In other words, there could be some unknown factors that contributed to, or on the contrary, hindered its achievement. Only a clear understanding of the management solutions relationship (Gushchina and Vasilkov, 2013; Gushchina and Vasilkov, 2013) (due to the identified causes) and achieved values and goals (i.e., the consequences of management decisions) are a way of guaranteeing the effectiveness

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of processes and systems (i.e., the ability to achieve the desired result) and effectiveness (i.e., to assess the necessary resources to achieve it) (Aniskina, 2013).

2. Problems

What are the obstacles to obtaining this information? There are a lot of such obstacles in real organizations and enterprises like in any large and complicated systems.

First of all, this is a great diversity between all components of the system, which form the actual system, which characteristics (properties) differ from the properties of its constituent subsystems and components. In addition, the participation of people at all stages of operation of the system here should be included: at the step of forming the system, analysis and management decision-making, and at the stage of their implementation and analysis of the results. (Vasilkov and Gushchina, 2010a; Vasilkov and Gushchina, 2010b; Vasilkov and Gushchina, 2011). All these problems can be solved by the use of a system analysis methodology.

3. Methodology systematic approach

3.1. Stages of system analysis

System analysis is mainly characterized by an orderly, logical reasonable approach to study the problems and the use of existing methods of their solutions, which can be developed in other sciences. The purpose of the system analysis is complete and thorough inspection of different options in terms of quantitative and qualitative comparison of the resources used to get an effect (the result, i.e. the achievement of objectives)(Aniskina, 2013; Aniskina, 2009).

Methodology for systematic approach in solving problems of systems analysis is to ensure that object research is oriented to the disclosure of its integrative qualities (i.e. systemic) for identifying the variety of relationships and mechanisms for these qualities. It is these relationships largely that determine not only the cause-and- effect relationships in the system, and, consequently, its properties, but the actual (not planned) system targets and its processes, requirements for the competence of personnel, management practices and efficient management system as a whole.

There are different approaches to the formation of certain methodology for studying the system (Aniskina, 2009; Aniskina, 2012) but in most cases these methodologies include in one way or another the following steps (Vasilkov and Gushchina, 2011; Lukasinski, 2011):

- identification of problems and issues,
- Identification of system goals, structure and implementation of the decomposition of goals
- creating ways to assess achievement of the objectives;
- Formation of criteria;
- generation of alternatives (different solutions);
- construction and use of models;
- management (or the broader control method - optimization);
- study of information flows;
- research of resource capabilities;
- observations and experiments on the system under study;
- management decision-taking;
- implementation of research results.

All this is done with a view of the interactions between the structural units of the system, the interaction with the environment, i.e. from system positions.

This list is enlarged, may have a different sequence of operations, each mentioned operation may be divided into smaller operations. This allows us to make the system analysis algorithms with varying degrees of detail. In this brief report we

consider some features of the individual steps.

Need for a systematic analysis occurs when a problem not only exists, but also requires the solution when the initiator of system analysis (eg, top management, the business owner and possibly, though indirectly, the consumer) has already formulated the problem, but the expert knows that original wording - only a very rough hint what should be the real be working formulation of the problem (Lukasinski, 2011). This applies not only to cases where the "problem master" only refers to the area of interest in the processes of setting goals ("How to improve the performance of a process?", "How to improve the activity and independence of managers?", "How to increase productivity in the organization?", "How to improve the process?", "How to improve the product quality?" etc.), but also when it is sufficiently concrete ("Which of the projects are to be taken to fulfill?" or "What should be the next-generation model of this item?").

3.2. Problems and issues

There are several reasons to consider any initial problem statement only as "zero approximation". The chief one among them is that problem having system (the so-called system, in the operation of which the manifested problem revealed itself as a negative, undesirable, for example, the non-achievement of underlying objectives in an integrated management system) is neither isolated nor monolithic: it is linked with other systems and is included as part of the super-system, it itrself, in turn, consists of parts, subsystems, in varying degrees involved in the problem of evaluating the effectiveness and efficiency of the system and its individual processes (Guschina, 2011; Guschina and Vasilkov, 2010; Vasilkov and Guschina, 2013). If this is indeed a real problem, and although management intends to weaken its sharpness, it is necessary to consider how it will affect those who are inevitably affected by the proposed changes. It is this aspect that allows you to choose the right direction "away from the problem."

Thus, any real problem a priori must be treated not as individual, but as part of a "tangle" of interrelated problems. Usually for this set the term issues "issues" is used. Using it, we can say that the problem formulation stage is to identify the issues. Without identifying and formulating related problems it is impossible to solve the one under consideration (Lukasinski, 2011).

Let’s consider a very simple example. A company produces a "good product", but it is sold very poorly, especially in other countries. It is sold among the "friends" - consumers rather due to certain traditions. Profits fall, there starts a noticeable outflow of qualified personnel. Clearly, something must be done! But what? Attempts to introduce innovative technology projects, significantly improving product quality and production efficiency, stumble upon the position of the owner or the manager: "No Money" (And why earlier as preventive measures had not been planned accumulation of funds for modernization? And "waited for" critical condition of the equipment?). And where will they come from, if the products are such that cannot be sold for currency necessary for the acquisition of modern foreign technology? There is a need to provide a high staff motivation, improve competence in a particular direction to improve production, and in response to it there is approximately the same position, "It is necessary to increase the intensity of the staff work!". In many enterprises, there exist a high level of basic vocational training but their professional management training is generally overlooked. One of the reasons for the outlined lag behind competitors - is the absence of active interest from management in the creation of new products, in the formation of research with a focus on proactive development of fundamentally new products, ie in a new culture of innovation production. It seems the problem

is understood, but there are "excuses" such as: "We are not research institutes, we have to make the products, but not...". Okay, please make. But how long is it going to last? At the present intensively varying time, probably not very long. Surely you can find another type of problem: whether it is necessary to reduce the "invisible" negative emissions into the environment, to reduce risks to personnel (Chakrabortty, 2013; Vasilkov and Guschina, 2011), and when "it is already for a relatively long time there were no such emissions, significant injuries and accidents." These are certainly not all so to say "competing" problems forming a tangle of interrelated problems that must be taken into account in the decision of any one.

3.3. Stakeholders

Usually the list of stakeholders is recommended to include decision-makers, i.e. those in whose powers directly the problem solving is, and the processes participants involved both active, i.e. those whose actions would be required for problems solving, and passive - those who are affected (positively or negatively) by the problem-solving consequences.

The word "concerned" should be understood in a broad sense, as in the list must be included both those who are not really interested in solving the problem and will resist possible changes.

Each of the "interested" parties have their vision of the problem, its treatment; its existence or disappearance will cause their own problems.The formulation of problems namely means the description of what changes are and why each of stakeholders wants to make them.

In fact, the problematic issues are the answer to the question: "What existing circumstances and past experiences make these stakeholders, in this cultural environment that includes these values, accept this state of affairs as a problem or as a normal state of affairs ("everyone works like that")? (Lukasinski, 2011)".

3.4. Setting goals

After determining the most important issues the following step of analysis is the identification of goals. To set the correct goal is more important than to find the best solution. Not the best solution still leads to the goal though not the best way. The choice of the wrong goals often leads not so much to the problem solving, but to new problems (Lukasinski, 2011).

Both well formalized and poorly structured problems should be brought to such statements when they become the task of choosing appropriate means to achieve the desired goals. At the first stage of system analysis it is determined what is necessary to do to relieve the problem (unlike subsequent phases that determine how to do it).

There are a number of difficulties when selecting goals. The main include the following.

1. Goal - a description of the desired future, where it is easy to make mistakes, and even to be wrong.
2. What is the goal for one level of the hierarchy, for another level it is means; they are easily confused.
3. Since the problem can not be separated from the issues, the goal is never the only one.
4. At a multiplicity of goals there is a danger of incorrect ranking.

As an illustration of some of the above difficulties, we'll show the following frequently encountered in practice enterprises goals: "Upgrade laboratory", "improve the QMS", "Improve the work environment", etc. What unites all these "goals"? First of all, for the organization, they are not the goals. First, the achievement of these "goals" can not be verified, and secondly, it is impossible to plan the required cost of implementation, i.e. evaluate the effectiveness of management decisions.

All this takes place because their implementation is too unspecific (simple replacement for nickel-plated nuts is an upgrade? And why not?), And meaningful implementation is not the result of this check (if any). Essentially they are all means (activities) to achieve real goals, namely: the modernization of laboratories can lead to increased measurement accuracy and it could be true goal related to a real problem), the improvement of the QMS can reduce the cost of its operation (which may also be a goal, if the costs of operation of the QMS are large), improving the working environment can improve lighting in the workplace (which also could be a problem to be solved), etc. These "alternative data" can be goals, especially if they are characterized by measurable rates, terms and allocated for their achievement, calculated resources, if they are generated by the specific problems of activities that do not ensure product quality, its given cost price, the required characteristics of the working conditions of staff. Namely, the current measurement error does not allow to assess the reliability of a given product quality or its components (a problem that may require its solving), the cost of operation of the personnel engaged in working with management system documents is very large (a problem that also may require its solving), light at a number of important to ensure product quality jobs is clearly inadequate and this leads to additional inconsistencies, rejects, etc. etc. Obviously, all listed as examples of "business objectives" may at a certain revision (to ensure compliance with the principles SMART) are goals of separate subsystems, thus forming a hierarchical structure of objectives throughout the organization. At the same time activities to achieve a higher level are the goals of this level, etc. Confusing goals and means of achieving them leads to unmanageable organization because of its efforts are focused not on truly necessary achievements and do not give an opportunity to plan with resources for such "goals", and, consequently, to assess the effectiveness of management decisions (Guschina and Vasilkov, 2012).

3.5. Resources

Achieving the goals always require certain resources (Bernardo *et al.*, 2011). They need to be identified and naturally allocated. It should be taken into account that if the goal is beyond the reachability (Aniskina, 2009; Lukasinski, 2011), i.e. the goal cannot be provided with the necessary resources to achieve it, the "movement" to the goal to achieve it will be false, not motivating. You can not humiliate the person than to get him to do useless work. If the goal is reachable, i.e. it is allocated more resources than required (if at all the amount of resources could be estimated), the excess resources would not only reduce efficiency, but also form a "confidence" in the ease of implementing the goal. The most optimal goal is located near the boundary of the reachable. It is fundamentally achievable that motivates staff to achieve the goal. All the "braking" effect slow motion toward the goal, but the art of the manager means that, in the circumstances, to get to the goal as close as possible. In the case of failure to achieve the planned goals there must exist a small margin "immobilization of capital", i.e. Reserve Fund, the amount which obviously affects the efficiency, but provides "the plan."

Management decisions on the formation of business objectives should take into account the totality of interrelated problems (problematic issues), so there will be several goals and they can be competitive, ie commitment to provide the best value of the index one goal (for example, the percentage of underperformance of the plan) may lead to the impossibility of improvement in reaching the other (for example, that unfortunately occurs, reduced product quality). Choosing "more important" as the main goal, of course it is easy to be mistaken, ie incorrectly rank objectives that

in turn will lead to the development of enterprise "to the other direction." (Lukasinski, 2011).

For example, competing are striving to improve the accuracy of measuring systems in a laboratory and a proper climate in the work area of specialists in the same laboratory, because they require separate, sometimes about the same equal cost. But in the real resource constraints the replacement of test equipment can "eat" most of the cost, and then the staff will continue to work in unsuitable conditions, which brings to "no effect" the improvement of measurement accuracy by increasing the level of errors and number of them, as related to human factor. But if the analysis (and not a subjective assessment of one specialist) would have shown that the more important issues lie precisely in errors caused by working conditions, their improvement would be a higher priority, and the aggregate outcome would have been better. In other words, from this example it is clear that an incorrect ranking of goals caused by underestimation of interrelated problems, can significantly reduce the effectiveness and efficiency of management decisions, i.e. management system as a whole (Vasilkov and Guschina, 2011; Vasilkov and Guschina, 2013).

3.6 Generating solutions (alternatives)

The next important stage in the development of management actions to achieve the target values of efficiency and effectiveness is to generate alternatives (different solutions), which can lead to the desired goals (Aniskina, 2013; Aniskina 2009).

Considering the complex and diverse relationships between subsystems and elements of the basic system formation and management decisions should be based on MEPI methodology - the methodology of enhancing professionals' intuition, which can be realized by various methods, including methods of brainstorming, direct brainstorming, scripting techniques, methods of structuring, expert assessments, etc.

In all the methods the freedom to express opinions is provided, the generation and discussion are separated in time, criticism is not allowed, chain reactions ideas and encouragement are supported. There are approaches to the division into groups. The 1st one contributes ideas, and others – criticize them. In practice, it is implemented by advisory bodies, the Academic Council, etc.

Using methods based on expert judgment it should be taken into consideration some features of this approach. Traditional problems of organizing such methodologies are:

1) formation of expert groups: requirements to experts, the number of experts in the group, assess their competence,
2) the form of the expert survey (questionnaires, interviews) and organizing the survey methodology, and
3) approaches to evaluation (ranking valuation, various ordering methods preferences, paired comparisons),
4) processing methods of expert ratings;
5) methods for determining the consistency of expert opinion, the reliability of expert assessments. It all depends on the specific tasks and examination conditions.

All these features lead to two situations addressing alternatives formation.

1) situations in which the experts are well provided with the information. In that case, you can use the principle of "good gauge" when an expert is the custodian of the information, then the group (average) score is close to the true alternative.
2) situations in which there is no assurance of justice statements of individual experts. In this case, the experts are not "good gauge" and it

is impossible to their opinions to the average, often the opinion of one deserves more attention than all the others. It cannot be averaged. Only qualitative processing ia applied here, including the choice of the extreme range of properties offered by "extreme", sharply different experts. Always rare opinions need to be carefully analyzed.

In all cases, any administrative decision must be assessed from the perspective of resource availability. Ability to plan resources characterizes the understanding of causality, without which you cannot hope for effective management of both a specific process, and the whole system.

3.7. Decision-making

Another milestone in the system analysis is a decision. Often it is said in civil organizations" on the top level of management": "Everyone must think as CEO thinks!". But this is irrelevant to modern management systems. Therefore, management decisions should be produced, refined and taken in discussions with expert reasoning. Naturally, such a methodology of adopting collective management decision should be a dignified feature of corporate culture. Collective decisions nonetheless must not replace the personal decisions made by decision-makers in less demanding applications.

One of the features to make managerial decisions is to assess the potential risks associated with decision (Aniskina, 2012). You need to be able to identify hazards that may accompany decisions, to assess the likelihood of their occurrence and severity of consequences in case of realization of (Bernardo et al., 2011; Vasilkov et *al.*, 2009). On the basis of these data, the calculation of risk should be carried out (preferably quantitative) of failing to achieve the goal, their ranking and to develop methods to reduce risks to an acceptable level before implementation. In addition, it is necessary to create a permanent functioning risk management system in the enterprise, which monitors the hazards and risks at different levels (Vasilkov and Guschina, 2011), but this is the "interests" of the new version of ISO 9001:2015.

Ensuring the correct decisions making taking into account methodology of the system analysis and risk management, requires first of all formation of the corresponding competences of the administrative personnel. Rather a large number of publications of authors of this work, their colleagues and other experts are devoted to this question.

3.8. Example

We will review the following example. There is a problem at the enterprise: the volume of orders is small and hence all corresponding negative consequences. It is necessary to find the solution of this problem, to increase the volume of orders.

Version of the decision 1 (almost traditional): The task of activity improvement for the solution is established by the director of the enterprise: To increase the volume of orders by 20%. The task is good, its achievement is possible to check. At the meeting of collective governing body the head charges to strengthen the work of marketing department, to represent enterprise production in environment more widely (exhibitions, tenders, etc.), appoints the head of marketing department to be responsible for extension of orders, asks to present the plan of works for achievement of the goal by the set time. For the marketing service head’s question "And what forces are there to do it? There are not enough people," - the answer is: "It is necessary to work more effectively! Find internal resources".

The first control of working upon the task takes place in presence of the same representatives in half a year. The chief of marketing service reports that for the first half of the year the number of orders has

increased by 10% thanks to observance of the approved plan of work. It allows to hope that in the second half of the year according to the plan the volume of orders will be increased by 10%. As a whole the annual goal will be reached. The head praises the successfully working chief and promises bonuses following by the results of the year.

At the meeting following by the results of the year: the planned growth of orders by 20% hasn't been achieved, but only by 5%. And it is in spite of the fact that in the first half of the year the growth was by 10%. The director fulminates with the head of marketing department, promising to draw organizational conclusions. Excuses like: "the work was performed strictly according to the approved plan" cause additional director's anger.

In this case the following scheme was taken: "There is a problem -the goal is chosen – the actions are chosen - resources for their realization are defined - the reached results are estimated".

Version of the decision 2 (not traditional): At the meeting of collective governing body the head organizes problem discussion about shortage of orders volume. Experts express different opinions, but the majority considers the work of marketing service insufficiently effective as it has to correct the situation with orders. Nevertheless, two experts express unexpected opinion: from where will marketing department take additional orders if at the enterprise the number of claims grows, in a pursuit of output the quality of production falls, productivity of often failing equipment decreases, the reputation of the enterprise falls, the personnel salary decreases, there is no motivation to effective work? Also these two suggest not to concentrate only on marketing, but to make the plan of works taking into account the contribution of every division working insufficiently effectively. The deputy head proposes the solution created by the majority: to strengthen the work of marketing department. However, the head suggests to carry out the detailed analysis of work improvement possibility of all divisions within a week time and to estimate their influence on overall performance of the enterprise as a whole.

In a week the appointed to be responsible for carrying out the analysis expert reports that for the last year there were 10 refusals of existing contracts for production delivery for the reasons of insufficient quality of production, its lag from production of front line branch companies was observed, there is no systematic improvement of product quality in design service that leads to obsolescence of let-out products, during the year none of TOP managers and heads of divisions improved their qualification that led to the inefficient organization of work at the enterprise, to motivation decrease of ordinary workers. The director agreed with the need to consider all these aspects, having really strong impact on productivity and overall performance of the enterprise. On the basis of the presented report the main goal was formulated: to increase the volume of orders by 15%. For achievement of this main goal the tasks to design department are set: by the end of the first quarter to introduce scheduling on products improvement, to carry out verification of all stages of works; to department of the personnel training: to increase competences of managers by training them inviting specialized organization; to department of the mechanic: to carry out the statistical analysis of the reasons of damage and to offer the plan of warning actions that will increase reliability of implementation of the plan; to human resource department : to conduct a questionaire among workers to identify the main reasons for a dissatisfaction with work. And at last, for marketing department: to organize broad promotion of all activities held at the enterprise for the purpose of improvement of product quality and increase of productivity that certainly will provide trust growth to the enterprise, and it in turn will arouse keen interest of potential customers in it and corresponding growth of

orders number. Such problem definition doesn't demand big additional material resources, the most part can be reached by purely organizational actions that will not only improve the image of the enterprise in external environment, but also will strengthen trust to it among its own employees.

Such integrated multilateral approach which directly hasn't been focused on increase in orders volume by a "power" way, as a result provided due to interaction of separate divisions (that any enterprise is strong with skillful management), growth of image, volume of orders, efficiency of activity and satisfaction of the personnel, which led as a whole to the planned growth of orders volume by 15%.

In this case the mechanism of the solving was the following: "There is a problem – problematic issues are formed - the goal or system of the goals is chosen - the structure of operated system, interrelation between separate parts is estimated - the assessment of system properties, opportunity to make changes is made - interested parties are defined - the set of decisions (alternative) is formed - actions taking into account interaction of components are chosen-resources for their realization are defined - the reached results are estimated".

Such approach which is based on methodology of the system analysis, allows to consider all enterprise as a unit at the solution of one problem that provides high productivity and efficiency.

4. Conclusion

We proved to be insufficient efficiency and effectiveness of integrated management system assessment based on goals analysis. Using the methodology of system analysis we showed that the goals should be agreed with the problems of the management system. The basic requirements for the goals were formed, their relationship with the various features of the activity was analyzed. Some features of approaches to the formation of management decisions aimed at achieving the goals were given. The necessity of taking into account the risk of failing to achieve due to management decisions was shown.

References:

Aniskina, N. (2009). Preparation of administrative persnnel for high-quality management. *Standards and quality*. 4, 76-79.

Aniskina, N. (2012) Quality of additional professional education: new concept. *Competence*, *9-10*(100-101), 5-13.

Aniskina, N. (2013). New horizons of additional professional education. *The higher education in Russia*, 3, 3-10.

Chakrabortty, R.C. (2013). Reducing process variability by using DMAIC model: case study in Bangladesh. International Journal for Quality research. *7*(1), (127-139, 127-139)

Gushchina, L. (2011). Creation of mathematical model of a quantitative assessment of enterprise risks for justification of investment decisions by personnel preparation. *European Social Science Journal (The European magazine of social sciences)*, 9, 363–372.

Gushchina, L., & Vasilkov, Y. (2012). Double level model of personnel competences formation at the enterprise to reduce risks. *Economics and Management problems*, 10, 145-154.

Gushchina, L., & Vasilkov, Y. (2013a). *Risk of management and management of risk. 2 revised*, Lambert, Germany, 284.

Gushchina, L., & Vasilkov, Y. (2013b). *Risks of management and management it is risk*. Monograph. Prod. the processed. Germany, Lambert, 288.

Łukasiński, W. (2011). The process of the formation of the quality Of organisation's functioning and Development. International Journal for Quality research, 5(3), 223-230.

M. Bernardo, M. Casadesus, S. Karapetrovic. Are methods used to integrate standardized management systems a conditioning factor of the level of integration? An empirical study. International Journal for Quality research. Vol.5, No. 3, 2011, pages 213-222

Vasilkov Y., & Gushchina, L. (2011). *Risk of management and management of risk*. Monograph. Ed. House Pastukhova, Yaroslavl, 244.

Vasilkov, Y., & Gushchina, L. (2010). Decrease in internal risks of the enterprise by administrative preparation of the personnel the Messenger of the Voronezh state university. *Series: Economy and management*, 1, 15-20

Vasilkov, Y., & Gushchina, L. (2010). Reduced internal enterprise risk management competence by forming competence of the staff. *Herald of the Voronezh State University. Series: Economics and Management*, 1, 70-77.

Vasilkov, Y., & Gushchina, L. (2011). Features of the risk assessment of projects. *6th International Conference ICQME2011, Montenegro, 2011*, 311-318

Vasilkov, Y., & Gushchina, L. (2011*). Risks of management and management of risks*. Monograph. Yaroslavl, prod. Pastukhov's house, 244.

Vasilkov, Y., & Gushchina, L. (2013). *Assesment of emergence probability in the analysis of administrative risks. Materials of the international e-symposium ES-E-2013-016 "Mathematical and tool methods of economy: theory, methodology, practice"*, Moscow. October 28-31, Under Vasilkov Yu.V. scientific edition.

Vasilkov, Y., Gushchina, L., & Injac, N. (2009). Risk Management in the preparation of personnel. *Materials 53 Congress EOQ Quality in an Age of Transition*. 12-14 May.

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