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NEEDS ANALYSIS SELF-ORGANIZING SYSTEM

Keerthana Mohan
Latvia, ISMA
e-pass: keerthanamohan169@gmail.com

Abstract

This study is devoted to the methodology, within the framework of which objective conclusions are issued on the state of the organization at the current moment in time. Such conclusions are formed for time periods of different duration. As a measuring toolkit, tools configured for a single criterion are used. Its presence makes it possible to set a system of restrictions, on the basis of which a bottleneck in the organization is identified. Depending on its scale, corrective measures are developed, including changes to the system itself. The degree of scale is determined based on the expert's ability to find the gap that exists between the established and consumed needs..

Keywords: suggestions, changes, quality, algorithm, instructions, manager, controllability

1 Introduction

The quality of the organization is determined by the readiness of the development manager to offer a reasonable set of proposals for improving the system. The content of readiness is determined by the provision of a transformation algorithm, based on which the organization will continue to productively operate. In addition, a corresponding instruction is needed explaining the need for the measures taken to restore the system. In practice, it is easier to develop an algorithm than an instruction. The point is that going beyond the established boundaries in most cases leads to the fact that the boundaries of the range of the key indicator change, and the events are recognized as unreliable. In fact, the contradiction is that when measuring efficiency, the fact of deviation is recorded, without indicating the place due to which this violation occurred. The problem of the study has the following formulation: "It is impossible to issue conclusions about the state of the organization in the absence of means for identifying the link whose action led to the exit from the stable functioning mode." In addition, it is necessary to know the amount of damage that the organization will suffer if it does not find a countermeasure. In this regard, the object of the study is a package of changes made to the measuring state system [1]. The quality level of such

changes directly depends on the ability of the development manager to change his attitude to accepting proposals for improvement. The quality of the modified algorithms determines the level of controllability. When analyzing a package of changes, it is important to determine the share of proposals received directly from the manager [2]. It is also necessary to analyze the package of changes taking into account their contribution to the value of the organization. This is where the essence of self-organization is determined. Fig. 1 shows the organization diagram of a self-organized system.

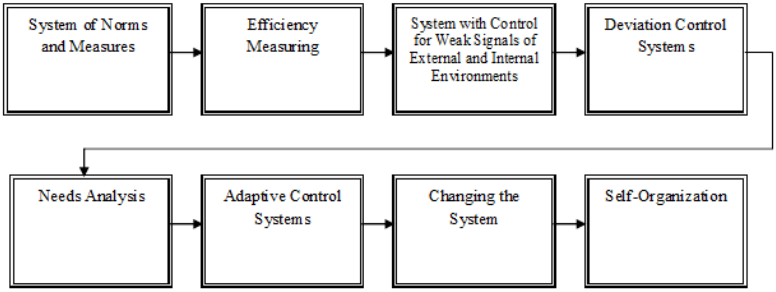

Figure 1. Structural diagram of a self-organized system

The developed diagram represents eight parts of a system belonging to the metatype class. For such systems, when assessing the state, it is necessary to disclose the main methodological provisions. In this case, each element of the metasystem must be considered from the standpoint of methodology. The needs analysis block is part of the metasystem.

2 Needs Methodology

The methodological unity of all elements of the metasystem is expressed by its structure. When analyzing needs, it is determined, on the one hand, what standards are proposed, and on the other hand, how they are measured. This requires an appropriate transformation algorithm and on the basis of what instructions the corresponding changes were made. It is precisely such instructions to algorithms that are objective for increasing the efficiency of the organization [3]. Taking into account the identified prerequisites, the definition of transformations is carried out by means of algorithms written in terms of efficiency. The purpose of this study is to develop a procedure that ensures the measurement of the efficiency of the full-scale activity of the organization. During the measurement, the state of the organization is determined. An unstable state is characterized when weak links are identified that, having a direct impact on the management system, pose a danger to the organization.

In relation to the analysis of the goal from the position of needs, three circumstances must be taken into account::

– Defines the system's objectives (e.g., efficiency, scalability, resilience).
– Aligns stakeholder expectations with the system's functionality.
– Ensures that the system can adapt to changes in its environment.
– In accordance with the goals, the following tasks need to be solved.Form the provisions of needs analysis in self-organizing systems
– Apply ROI mechanisms in needs analysis
– Assess non-financial needs in self-organizing systems
– Determine the prospects of needs analysis

Needs analysis is the process of systematically identifying the goals, requirements, and challenges of a system. For self-organizing systems, this involves understanding the autonomous behaviors, adaptability, and optimization requirements that allow the system to function without centralized control, emphasize the significance of using frameworks like ROI mechanisms to ensure these systems align with organizational goals [4].

For instructions from the manager, the following form should be used (see Table 1).

Table 1

Form for preparing instructions for system transformation

,,,,,,,,,,,,,,, State / **Methodology element**	*Evaluation of the current state of formation of a conclusion about the weak link of the software organization system*	*Selection of a short-term option for improving the system based on the replacement of ineffective elements of the system*	*Development of a medium-term scenario for the growth of the organization's potential*	*Formation of instructions for improving software in the long term on this*
Contradiction				
Problem				
Object				
Purpose				
Result				

This project uses survey-based system analysis and ROI-driven methods to identify key weaknesses and guide improvements in software organizations. By implementing short-, medium-, and long-term strategies, organizations can measure and sustain growth effectively [5]. Additional analyses, like gap assessment, further strengthen system modernization efforts. Ultimately, continuous evaluation and adaptation enable the organization to evolve and maintain a potential development.

3 ROI Mechanisms in Needs Analysis & Non-Financial Needs in Self-Organizing Systems

The first ground focuses on how Return on Investment (ROI) is integrated into self-organizing systems as a means of ensuring cost-effectiveness and efficiency. Needs analysis for ROI involves the following steps:

*Data Layer**:***

– Establishes the ROI formula to calculate returns accurately based on inputs.

– Identifies relationships between various components (e.g., resource allocation vs. output).

Information Layer:

– Highlights patterns in resource usage and output efficiency.

– Ensures that the input-output flow aligns with the system's objectives.

Knowledge Layer:

– Develops norms and rules to guide ROI evaluation.

– Ensures problems in task execution or resource allocation are addressed.

Wisdom Layer:

– Adjusts the ROI formula to resolve contradictions (e.g., balancing short-term gains with long-term sustainability).

– Aligns financial metrics with broader organizational goals, such as innovation or scalability.

The second ground expands on non-financial factors that must be considered during needs analysis. While financial metrics like ROI are important, non-financial aspects ensure the system's robustness and adaptability.

Scalability:

– Ensuring the system can handle increased demands without significant redesign.

Sustainability:

– Incorporating environmentally friendly and socially responsible practices into the system's design.

User-Centric Design:

– Ensuring the system meets user needs and provides a seamless experience.

Risk Management:

– Identifying vulnerabilities and designing solutions to mitigate potential issues.

These non-financial decisions ensure that the system remains relevant, adaptable, and aligned with stakeholder expectations.

4 Approach Testing

As part of the adaptation of the approach, an analysis of the activities of Novo Nordisk, which has long been the most sustainable company, was carried out [6]. The comparison is made in the context of two conditions: with key principles of self-organizing systems and ROI-focused frameworks (See Table 2).. This comparison highlights differences and alignments across their operational, financial, and strategic approaches.

Table 2

Comparison of Novo Nordisk and Self-Organizing Systems

Aspect	Novo Nordisk	Self-Organizing System	ROI Frameworks
Core Purpose	Focused on **healthcare innovation** and addressing chronic diseases like diabetes, obesity, and hemophilia.	Aim to adapt and reconfigure dynamically to achieve goals without centralized control.	Optimize investments by aligning financial returns with strategic objectives.
Decision-Making	Centralized authority with specialized teams driving innovations and treatments.	Decentralized and autonomous, relying on feedback loops and adaptability.	Driven by systematic evaluation of data, information, and financial insights.
Adaptability	Balances **R&D investments** to respond to changing healthcare needs.	Highly adaptive to environmental changes, ensuring real-time optimization.	Focuses on dynamic adjustments in ROI calculation methods to reflect evolving scenarios.
Resource Utilization	Allocates resources based on **market trends**, patient needs, and regulatory requirements.	Self-regulates resource consumption to meet operational demands efficiently.	Analyzes data to ensure efficient resource allocation for maximum returns.
Sustainability	Emphasizes **environmental sustainability** through eco-friendly operations and long-term patient care strategies.	Ensures sustainability by minimizing resource wastage and maintaining operational balance.	Incorporates sustainability metrics into ROI calculations to align with strategic goals.
Learning Mechanisms	Adopts continuous **R&D improvements** and patient feedback to refine solutions.	Relies on self-learning through feedback loops and data-driven adjustments.	Uses insights from past data to refine ROI models and investment strategies.
Decision-Making	Centralized authority with specialized teams driving innovations and treatments.	Decentralized and autonomous, relying on feedback loops and adaptability.	Driven by systematic evaluation of data, information, and financial insights.
Collaboration	Encourages interdisciplinary collaboration between scientists, healthcare professionals, and policymakers.	Operates collaboratively within system components to achieve emergent properties.	Aligns stakeholders to prioritize investments and ensure alignment with objectives.

Both Novo Nordisk and self-organizing systems prioritize learning mechanisms–whether through patient insights or feedback loops. ROI frameworks complement this by using historical data to optimize future investments

The comparison underscores the overlap between Novo Nordisk's strategic approach, self-organizing systems' adaptability, and the ROI-focused WKID framework. Each leverages data, learning, and sustainability to achieve its goals, albeit through distinct operational and decision-making models. By integrating these principles, organizations can build systems that are innovative, adaptive, and aligned with long-term objectives. The needs analysis for self-organizing systems, as described in both files, is a multi-layered process. ROI mechanisms act as a cornerstone, ensuring that the system remains efficient and cost-effective while continuously improving through feedback and learning. These insights create a roadmap for designing adaptable, efficient, and sustainable self-organizing systems

5 Conclusions

As practical results, the approach of neutralizing the key errors of the organization is used, which allows obtaining an objective picture of the growth potential.

This study uses ROI-based system to identify key weaknesses and guide improvements in software organizations. By implementing short-, medium-, and long-term strategies, organizations can measure and sustain growth effectively.

The proposed approach to needs analysis showed that the development of the organization depends on the ability of the software development manager to determine the modification package. This is the main contribution to the growth of the organization. As a means used to assess the needs for change, the ROI technology is expanded to the level of the system. Methodological provisions form ideas about the weak link of the organization and are an objective means for transforming the algorithm that ensures the determination of the effectiveness of the organization. In the course of self-organization, instructions for changes are formed. The practical value of the study is the development of a system of evaluation standards, measuring the effectiveness of the organization on the current date, taking into account the conditions of various time intervals.

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