

SECTION 6. ENGINEERING SYSTEM-BASED MAINTENANCE

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USING ENGINEERING SYSTEM DESIGN: AN ORGANIZATIONAL LIFECYCLE APPROACH

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Abstract

This study deals with the engineering system idea. The relevance of this work derives how it is carried through all the stages of the system life cycle. This is achieved through the timely identification of weak chains in the organization. In the course of assessing the amount of losses it the necessary give a detail description of the life cycle phases and solve the tasks involved in each phase. The work used methodology of engineering systems, such as the high-level organization of the overall building and release of complex systems.

Key words: *needs, risks, performance, algorithms, changes, distributes, managements.*

1. Introduction

The initiation of Engineering System design begins with the requirements analysis phase, where a thorough investigation of the project goals takes place. Interaction with stakeholders is crucial for a complete understanding of their needs [1]. This enables the creation of a strategic project plan, including timelines, resource allocation, and risk identification. During the design flexible methodologies such a System Life Cycle Model and Greiner Growth Model are implemented to ensure continuous feedback and an iterative approach [2, 3]. Developing complex systems can be challenging many factors need to be considered, such as: system requirements, functionality, performance, reliability, cost, maintainability. Without a systematic approach, it can be difficult to ensure that all of these factors are addressed in a coordinated way. At the phase of selecting

proposals for improving activities there is a conflict between the interested groups of the firm. Problem of this study is expressed in the form of the following definition: “It is impossible to ensure the performance replacement of weak chains of an organization in the absence of means for selecting innovative proposals”.

2. Define Tasks

Following from the identified problem the object of the study is a set of algorithms that allows to maintenance a new version of the system functioning in the changed conditions. The aim of this research is to develop a procedure that provides a system of flexible measures to come out of difficult situations. In accordance with the aim, the following main tasks were formulated:

- To develop a Systems Engineering Life Cycle Model [2].
- To adopt Greiner Growth Model [3].
- To find place of the Engineering System in the System Life Cycle.
- To implement the medium-term scenario in the conditions of ROI investment [4].

Detailing the tasks allows to identify the Systems Engineering key stages [2]. It should be noted that such functions are performed at certain phases of the Greiner model (see Table 1).

Table 1

Distribution of Systems Engineering stages by Greiner phases

Life cycle phase Greiner's model	Life cycle stage: Systems Engineering
First phase of creativity	Requirements definition: Specifying the needs and the expectations of the stakeholders
Second phase of directive leadership	System design: Developing a scheme of the system by describing its parts, interfaces and functions
Third phase of delegation	Development: Designing and implement the system components as per the plan.
Fourth phase of coordination	Integration and test: Merging the parts of the system together and looking to see that all the parts work together as one unit.
Fifth phase of cooperation	Deployment and operation: Installing the system for their end users and offering technical support and maintenance services.

With the help of this procedure, objective conclusions are issued about the current state of the analyzed enterprise regarding unchangeable state of the target-crisis indicator. In practice, the transition from stage to stage is caused by crises. So, each crisis is grounds for design algorithm to help overcome a difficult situation for the organization. Taken together, the implementation of such measures represents a scenario for the development of the enterprise. Figure 1 shows L.Greiner's life cycle model of organization, adapted in the conditions of Engineering System.

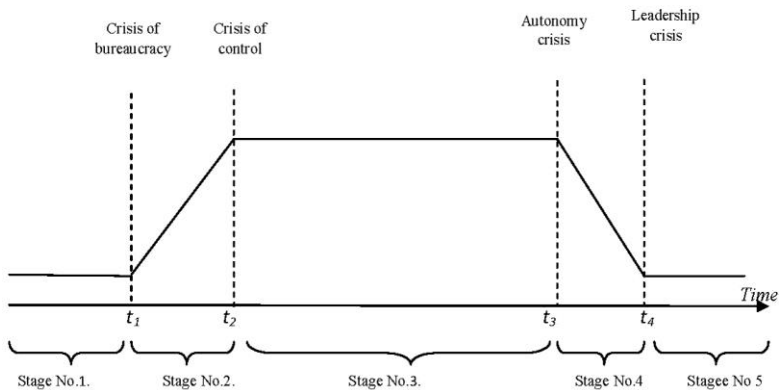


Fig. 1. Crisis phases of L. Greiner in the organization Engineering System Life Cycle

The stages of organization life cycle change as a result of the strategic transformations, so named “Backward Reconstruction”, taking place in the organization, caused by the corresponding crises.

Transformation of the Systems Engineering approach to the Engineering of System conditions means a set of algorithms in the development of complicated systems. Its prescription is to define the system requirements, design the system architecture, and make certain that the system design check is made integrate the system components, test and role the system out, run and store the system.

3. Conclusions

The results of this research lie in the design of recovery procedures used to overcome obstacles in the conditions of bringing a enterprise out of crisis

conditions. The basis of the procedures is a algorithm for converting traditional information into analytical forms that make it possible to determine the level of the possible losses and benefits. Comprehensive tools contain instructions to maintenance well-functioning management products.

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