The digital paradigm of strategic sustainability management in automobile operating companies

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Abstract. The article proposes a system for managing the strategic stability of the enterprise in the transition to a digital economy based on a systematic approach. The control system internal structure is disclosed. The components of the system and their functions are considered. A diagram showing the behavior of the system is presented.

1 Introduction
The digital age is transforming everything: the nature of markets and products, production methods, delivery and payment methods, the scale of capital for working on a global scale and the need for human capital. It also increases labor productivity, introduces enterprises to new ideas, technologies, new management and business models and creates the new access channels to the market. And all this at a relatively low cost. In digital economy, enterprises will increasingly rely on artificial intelligence to perform the basic routine and more complex tasks [2]. The problems of enterprises in digital economy are the subject of the work of I.L. Avdeeva I.L., Guskova N.D., Bruskin S.N., Kitova O.V., Kane G., Palmer D., Phillips A., Kiron D., Buckley N.

The importance of sustainability as a business problem is growing steadily. Most businesses realize that their sustained success depends on the economic, social and environmental context in which they operate.

To remove the obstacles preventing enterprises from participating in digital economy, it is necessary to develop a paradigm, based on which digital technology plays a huge role, influencing the strategic development of enterprises.

The problem of managing a motor transport enterprise is a complex problem that needs to be structured in the context of the transition to digital economy, which requires the use of a systematic approach, which consists in the fact that any business entity is considered as a relatively independent system with its own characteristics of functioning and development.

The economic basis of the development management system’s digital paradigm is to increase the automobile operating companies’ efficiency, create the prerequisites for their strategic development and improve the transparency of customer-oriented processes.

The purpose of this study is to build a digital paradigm for the strategic sustainability management system of automobile operating companies.
2 Digital paradigm

From the general systems theory it follows that for the normal functioning of the system external influences the following parameters are necessary: the external environment, input, output, process.

At the same time, entry means the flow of resources entering the system and ensuring its functioning and development. What converts an input into an output is called a process. The output will be the system functioning result. The output can also be defined as the purpose of the system, and each subsystem will have its own output (s), consistent with the target development of the system. Inputs and outputs connect the system to the environment.

In a systematic form, the strategic sustainability management system of automobile operating companies is shown in Figure 1.

![Figure 1. The strategic sustainability management system of automobile operating companies](image-url)

In the process of its functioning, the system is divided into the controlling and managed subsystems.

The elements in the system are interconnected with each other. It is the relationships study that makes it possible to understand the internal systems' nature. Without connections, the system turns into a mechanical set of components.

Connections are a rather complex phenomenon, since they are characterized by diversity and versatility. From the point of view of the sustainability study, it is necessary to distinguish between direct and feedback, communication of functioning and development.

Direct connections express the connections between the elements (subsystems) of the system. Feedback informs the input of the output status and acts as a system control function. Feedback can both regulate the target settings of the system, and establish the relationships between the system.
elements. If at the same time the system is developing, then the feedback action can be evaluated as positive and vice versa.

The management mechanism involves the development of a strategic sustainability management concept for the automobile operating companies, providing the necessary management conditions.

The main goal of the management system is to ensure the mutually agreed development of all types of activities at the enterprise, which should be expressed in the following subsystems:
- knowledge management subsystem designed for digital management at the enterprise;
- subsystem analysis designed to process and analyze data and information;
- strategic sustainability management subsystem designed to provide strategic sustainability management;
- management subsystem for the effective use of strategic resources at the enterprise, designed to monitor, evaluate the enterprise operation and based on the assessments received, adjust the strategic stability management system of automobile operating companies;
- risk management subsystem designed to implement the risk management function;
- innovation management subsystem, designed to create and implement the new types of services demanded by the market, as well as mastering the innovations to achieve the competitive advantages in the long-term development period.

Each of these subsystems has such management functions as analysis, organization, planning, control.

1) Analysis. In digital economy, management should evolve away from descriptive analysis towards predictive analysis, i.e. based on accumulated knowledge to predict the future.

2) Organization. The organization of strategic sustainability management should be developed in the direction of intelligent forecasting based on predictive analytics - predicting unknown values and predicting the development of processes.

3) Planning. In the new digital paradigm, planning should be done in real time. Obviously, machine learning will play a big role in decision making. Machine learning provides the necessary algorithms, applications and frameworks to improve forecasting accuracy and the enterprise data value.

4) Control. In the context of digitalization, control should be developed through the further development of visualization tools and services for working with smart devices, big data and other components of the digital economy.

Decomposition of the strategic stability management system of automobile operating companies allows you to set the goals, functions and tasks of each subsystem. The application of this theory makes it possible to create a structural-functional-informational model for managing the strategic stability of automobile operating companies.

With a structural approach, the system is decomposed, with the goal of further implementation in the separate subsystems form. The composition and behavior of the strategic sustainability management system can be described using the visual modeling language UML.

A functional model is a description of the functions that a system performs. The functions are distributed by the subsystems.

The information approach characterizes the information flows necessary for the analysis and management of the strategic stability management system of automobile operating companies.

UML use case diagram defines the strategic resilience management system behavior (Figure 2).
Figure 2. Structural and informational model of the strategic sustainability management system of the automobile operating companies

The strategic sustainability management system of automobile operating companies should provide the following opportunities:
- **actor**: the leader uses the system to form a mission, make decisions and monitor the environment state;
- **actor**: the economic service uses the system to identify and evaluate the strengths and weaknesses of the enterprise, market opportunities and threats; the formation of strategic goals and objectives of strategic sustainability management; development of the strategic sustainability management system concept; formation of management strategies; development of the strategic management plans’ system; development of a system of temporal stability indicators, spatial stability, a system of enterprise activity indicators, a balanced system of indicators; the formation of strategic sustainability indicator; conducting a trend analysis of the strategic sustainability indicator; development of monitoring and control procedures; forecasting the market environment at the enterprise; scenario development and management forecasts; forecasting based on leading indicators; roadmap development; development of approaches to identification and risk assessment, recommendations for minimizing risks; formation of a strategic map; management by the objectives; ABC customer analysis; budget system development; business process reengineering; transformational administration; the formation of an innovative development program; identification of the ways to improve the management system effectiveness;
- **actor**: the operational and technical services use the system for accounting, collection and primary data processing;
- **actor**: the information service uses the system to provide the management system information; bringing information to departments; formation of a knowledge base - a set of interrelated rules that formalizes the specialists’ experience; develops an expert system giving recommendations for choosing further actions; machine learning use to improve the customer service.

Strategic sustainability management of automobile operating companies is based on the implementation of certain functions (Table 1).

**Table 1.** The component system functions of strategic sustainability management for automobile operating companies
| System components                  | Implemented Functions                                                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge management              | information management system; bringing information to the departments; formation of a knowledge base - a set of interrelated rules that formalizes the experience of specialists; develops an expert system giving recommendations for choosing further actions; machine learning use to improve the customer service |
| Analysis                          | to identify and evaluate the strengths and weaknesses of the enterprise, market opportunities and threats                                                                                             |
| Strategic sustainability management | - strategic sustainability management strategy; - formation of a system of indicators of temporal stability and spatial stability; - formation of a strategic sustainability indicator; |
| Managing the efficient use of strategic enterprise resources | the formation of strategic goals and objectives of strategic sustainability management; development of the concept of strategic sustainability management system; formation of management strategies; development of a system of strategic management plans; development of a system of indicators of temporal stability, spatial stability, a system of indicators of enterprise activity, a balanced system of indicators; the formation of a strategic sustainability indicator; conducting a trend analysis of the strategic sustainability indicator; development of monitoring and control procedures; forecasting the market environment of the enterprise; scenario development and management forecasts; forecasting based on leading indicators; roadmap development |
| Management of risks                | development of approaches to identifying and assessing risks, recommendations for minimizing risks                                                                                                           |
| Innovation management             | formation of a strategic map; management by objectives; ABC customer analysis; budget system development; business process reengineering; transformational administration; the formation of an innovative development program; identification of ways to improve the effectiveness of the management system |

3 Summary
Thus, in digital economy, those enterprises that use modern information and communication technologies receive advantages in managing the strategic sustainability. The development of new technologies has led to dramatic changes in the competition methods and the worldview of market entities, and has provided enterprises with many opportunities to find and put into practice the new ways to increase strategic sustainability.

Summing up, we note the following. The digital economy encourages enterprises to transform almost all of the business tools and functions. To develop strategic sustainability in digital economy, the enterprises should constantly improve their competence in the field of working with information and especially in the field of digital technologies for data collection, processing and storage.

One of the most important issues for a modern enterprise operating in digital economy is the formation of its external and internal structure of the management system. The company should implement a strategic sustainability management system to achieve the strategic goals in the long term.

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