

Strategy development management of Multimodal Transport Network

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Abstract. The article gives a brief overview of works on the development of transport infrastructure for multimodal transportation and integration of Russian transport system into the international transport corridors. The technology for control of the strategy, that changes shape and capacity of Multi-modal Transport Network (MTN), is considered as part of the methodology for designing and development of MTN. This technology allows to carry out strategic and operational management of the strategy implementation based on the use of the balanced scorecard.

1 Introduction

In the Transport Strategy of the Russian Federation [1] formulated the main objectives of the Russian transport system development for the period till 2030.

One of the most important tasks is to create globally competitive transport corridors for the successful integration of Russia into the global transport system that will contribute to the implementation of the transit and export potential of Russia, repaying investments.

To solve this problem in [2] proposes to allocate from the unified transport network (UTN) multimodal transportation network (MTN), as a set of multi-modal transport corridors (MTC), consisting of a multi-modal transport nodes and transport links of the various modes of transport, to address the strategic objectives of UTN development on the main transit and export routes.

2 Methods

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Analysis of existing studies has shown that over the past decades numerous works about an effective development of transport infrastructure for multimodal system appeared [2-10 etc.].

[3] deals with the issues of multi-modal transport corridors formation, based on a systematic approach. In [4] one can find an example of investigating of formation questions using Novosibirsk multimodal transport node. [5] analyzes the history and current state of the Euro-Asian corridors, placed through the territory of Russia. A lot of attention is paid to the strategy of the creation of a core terminal complexes and logistics centers in major nodes and seaports. Moreover, the issues of ITC formation in Russia and ensuring the national security were investigated.

[2, 6, 7] deals with the integration of Russian transport system into international transport corridors. The favorable geographical position of Russia between the growing economies of Europe and Asia-Pacific Region gives a chance to the Russian transport to become a major trade link.

In [8] proposes a method of estimating the competitiveness of transport corridors using the method of the ideal point.

[9, 10] describes the methodology of addressing the formation problem, and then development problem of Trans-European Transport Network (TEN-T). Unfortunately, this approach does not take into account the problems and specifics of Russian transport and economy, mainly focusing on the objectives of the EU transport infrastructure.

The influence of external and internal factors on the formation of MTN and choosing its development strategy is considered in [11, 12]. The conceptual proposals for the development of "Asia-Pacific Region - Europe" ITC are also formulated in this work. Based on these, it was suggested the method of justifying and economic assessment of ITC projects.

In studies [13-19] proposes models, methods and techniques developed within the framework of a unified methodology for the MTN design. It allows you to determine the area of effective strategies that change MTN shape and capacity, and, finally, using this basis choose the optimal solution.

This article deals with the technology for management of accepted MTN developing strategy, ensuring the successful implementation of it. This technology is designed based on positions of strategic management [20-24], using the main universal management functions – planning, accounting, control and analysis – and includes the following [25]:

- 1) Planning the implementation of adopted MTN shape and capacity change strategy;
- 2) Organization of resource provision of finance, time, materials and contractors;
- 3) Monitoring performance of action plan and achieving the target indicators of the strategy [15];
- 4) Deviation analysis of actual quality indicators, cost and work time by monitoring of data (see item 3.);
- 5) Correction of the action plan for the development of MTN;
- 6) Definition of the regulatory technical, operational and economic performance of MTN taking into account corrected plan.

Implementation of the adopted strategy should be regularly analyzed in order to timely detect deviations from the scheduled plan and evaluate their impact on target indicators. Regular measurement of project parameters and identification of emerging deviations relates to performance monitoring.

According to the data collected during implementation monitoring, makes analysis for assessing of condition and prognosis of strategy execution success in accordance with the criteria and limits. These constraints are defined at the design and planning stage based on the Balanced Scorecard (BSC) [14,15]. The basic limitations include targets indicators,

deadlines, quality and cost of the work. In the case of negative prognosis, we need to make corrective action, the choice of which is carried out in the change management process.

The main processes of analysis are directly related to the above restrictions

- 1) Timing analysis - determination of conformity of actual and projected deadlines;
- 2) Cost analysis - determination of conformity of actual and forecasted cost;
- 3) Quality analysis - monitoring results to check on compliance with relevant quality standards and identifying ways to eliminate causes of the declining quality indicators values;
- 4) Confirmation of the purposes - acceptance of the contribution of participants (investors, consumers, etc...) in the implementation results.

According to the analysis of the results, makes the decision to continue previously scheduled plan or determine corrective actions.

Determination and application of the necessary control actions with a view to the successful implementation involve the following steps:

- 1) If the execution of the strategy is in accordance with the agreed plan, the management actually need to deliver to the participants their targets and monitor their implementation;
- 2) If in the process of implementation any crucial deviations appear, it is required to find the optimal corrective action, adjust the plan of remaining work and to agree on the pending changes with all stakeholders.

At this stage the main management processes are:

- 1) General change management – definition, coordination, approval and acceptance to perform corrective actions and coordination of changes in strategy;
- 2) Resource management - changes in the composition and the assignment of the resources;
- 3) Management of objectives - adjustment of target indicators using analysis results;
- 4) Quality management - development of measures to address the causes of unsatisfactory execution.

Thus, the technology of strategy development management based on BSC [14,15] allows to efficiently manage the trajectory of changing of MTN shape and capacity. Along with that, it is made in accordance with the overall objectives and taking into account changes in the implementation conditions throughout the estimated period. The practical use of the proposed technology allows solving following problems:

- 1) Support of the action plan implementation;
- 2) Effects analysis of the plan implementation for the mtn development and its subsequent adjustment for the further period.

At the same time a prerequisite for the successful implementation of the strategy is its support of the expert group, which should include:

- MTN strategy developer;
- Specialists in modes of transport, which are part of the ITC;
- Specialists in the organization of multimodal transportation and logistics services;
- Representatives from customs control;
- Experts in foreign economic activity and international communication;
- Investment managers;
- Representatives of administrative structures and legislative power from areas through which ITC goes;
- Ecologists;
- Specialists in regulatory support and standardization.

One of the coordinators of the expert group should be the strategy developer, who has access to all sources of information provided to MTN designing.

The expert group is involved in the development of the investment project on the chosen strategy and coordinates the actions of all participants of the project.

3 Conclusion

Proposed technology of MTN strategy development management is the final element of the designing methodology. It allows to identify possible deviations from specified purposes [15] in the implementation of the strategy caused by the influence of external and internal factors [11,18,22,26], evaluate the variation data and make the necessary adjustments.

The external factors include:

1. The political environment in the countries of the region under study (change of power, war, sanctions, etc.);
 2. Economic conditions (market conditions, financial and credit policies, the economic interests of the participating member-states and private investors);
 3. Infrastructure links between the participants of the strategy, that determines the conditions of rational distribution of productive forces, environmental management, environmental protection and others.
 4. Social conditions (demographics, the level of employment, etc.);
 5. Natural and climatic disasters;
 6. Technological conditions (the development and spread of new technologies).
- The internal factors include:
7. Technical (changing the technical condition of the mtn due to failure of its elements);
 8. Economic (financial instability, capital intensity growth in the construction process due to unaccounted factors associated with the uncertainty of the source data);
 9. Availability of human resources and their level of qualification.

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