MULTI-LEVEL SYSTEM FOR PLANNING THE IMPROVEMENT OF THE LOGISTICAL POTENTIAL OF AN ENTERPRISE

Sergii Vyshniuk,
PhD student
Khmelnytskyi National University
Ukraine

Halyna Skyba,
Lecturer
Khmelnytskyi National University,
Ukraine

Abstract.

The article substantiates a multi-level system for planning the improvement of the logistical potential of an enterprise, aimed at overcoming the disconnect between strategic vision and operational logistics execution. The research methodology decomposes the planning process into five logically integrated stages: forecasting, optimal variant selection, strategic planning, tactical program development, and budgeting coupled with control. A fundamental distinction is drawn between three-vector forecasting and long-term planning, utilizing gap analysis to precisely define the desired future state of logistical capabilities. The study moves beyond the binary separation of strategic and operative management, proposing a continuous hierarchy that aligns functional logistics plans – such as infrastructure modernization and inventory management with long-term market trends. A closed-loop feedback mechanism is substantiated to monitor deviations and dynamically adjust development trajectories. This system provides a comprehensive toolkit for ensuring that daily logistical operations actively contribute to the systematic enhancement of enterprise potential.

Keywords: logistical potential of an enterprise; multi-level planning system; strategic logistics management; three-vector forecasting; gap analysis; operational planning integration

1. Introduction

Market conditions, in which enterprises have been operating for over a decade, increasingly highlight the critical significance of long-term development programs, particularly in the sphere of logistics and supply chain management . In the current volatile economic environment, the logistical potential of an enterprise– defined as its capacity to perform logistics functions effectively through the integration of resources, technology, and management processes–has become a decisive factor in maintaining competitiveness. However, the absence of a robust planning methodology at many enterprises, combined with the pursuit of "instant" problem-solving and the outflow of qualified planning specialists, has caused a significant gap in the strategic management of logistics activities .

Consequently, if enterprises formulate plans at all, they tend to be strictly operational, calculated for specific customers and formed based on previously drawn-up supply contracts . Naturally, such plans do not and cannot contain long-term or medium-term measures for the development or enhancement of logistical potential . This short-term focus creates a disconnect where the strategic vision of the company is not supported by the necessary logistical capabilities. Analyzing the views of authors such as H.I. Ansoff [1], W. King [8], and P. Kotler [9] on strategic planning, several distinctive features can be identified: a predominant target orientation, the definition of various methods to achieve set goals, flexibility in time orientation, and the interpretation of the future using gap analysis . However, applying these general strategic principles specifically to logistics potential requires a specialized approach.

Modern research indicates that the management system of a large company typically functions in two modes: strategic and current management . Most authors substantiate management systems based on comparing and contrasting strategic management with operational management . However, a simple two-element system is not viable in a changing external environment, as there is a clear detachment of strategic long-term goals from operational logistics tasks.

Therefore, there is an urgent need to transition to a multi-level planning system for improving logistical potential. This system must be relatively simple to understand, divided into distinct phases where activities and responsibilities are defined . It must also provide for the transition from long-term to medium-term and annual planning, ensuring that the implementation of strategies utilizes the accumulated logistical potential effectively . The goal of this study is to examine such a system within the framework of general strategic management, addressing the gap between theoretical strategic planning and practical logistics operations.

2. Materials and methods

The methodological basis of this research is founded on a systems approach to management, which allows for the consideration of the planning system for improving logistical potential as an integrated set of interconnected elements. The research methodology aims to resolve the contradiction between the need for long-term development of logistical capabilities and the prevalence of short-term, operative planning in modern enterprises . To achieve this, the study employs a multi-level modeling approach, treating the planning process not as a dichotomy of strategic versus operational management, but as a continuous hierarchy that integrates long-term, medium-term, and current planning activities .

2.1. Systemic decomposition of the planning process

To structure the mechanism for managing logistical potential, the research utilizes the method of process decomposition. The planning system is viewed through two dialectical aspects: as a process (the formation of a future image and decision-making flow) and as a result (a system of documented, interconnected tasks) . The methodology distinguishes five logically connected stages of planning to ensure the effective enhancement of logistical potential:

1. Strategic planning (analysis of possibilities).
2. Tactical planning (transformation of directions into detailed tasks).
3. Operational implementation (program of actions).
4. Budgeting (resource allocation).
5. Control (data accumulation and correction) . This phased approach allows for the identification of specific responsibilities at each stage and ensures that the complex task of logistical development is broken down into manageable phases [8].

2.2. Forecasting and gap analysis methodology

A critical methodological component of this study is the distinction between forecasting and long-term planning. The research employs a three-vector forecasting method:

- **The temporal vector:** Determining the time horizon of logistical trends.
- **The directional vector:** Identifying specific future tendencies in supply chains and markets.
- **The quantitative vector:** Estimating the degree of future changes . This forecasting method serves as the baseline for establishing the "desired future state" of the enterprise's logistical system . To bridge the current state with this desired future, the study applies the method of "gap analysis" (analyzing the discrepancies between goals and achieved results), as grounded in the strategic planning theories of Ansoff and King . This allows for the precise definition of the necessary increase in logistical potential required to meet future market demands [7].

2.3. Multi-level integration of logistical potential

The research explicitly rejects the simple two-element system (strategic vs. operative) as non-viable in a volatile environment . Instead, a multi-level integration method is proposed. This involves synthesizing long-term strategies with medium-term and annual plans to ensure that daily operational decisions in logistics are justified from the perspective of future development . The methodology focuses on the "transition mechanisms" from long-term to medium-term planning, ensuring that the implementation of strategies utilizes the accumulated logistical potential of the enterprise . This approach allows for the creation of an integrated decision-making system where every functional plan (transport, warehousing, inventory) contributes to the overall strategic goal [3].

2.4. Optimization and resource allocation

To select the most effective trajectory for developing logistical potential, the research employs optimization and budgeting methods. At the stage following forecasting, the methodology involves selecting the optimal development variant from possible alternatives . Subsequently, the budgeting method is applied to perform a value assessment of the development program and distribute resources accordingly . This ensures that the plan for improving logistical potential is not merely a theoretical construct but is supported by calculated financial and material resources, including both internal reserves and external sources such as bank credits.

2.5. Feedback and corrective mechanisms

The final methodological block focuses on the control and adaptation of the planning system. The research utilizes a feedback mechanism that accumulates data on the implementation progress of each planning stage . By analyzing the deviation of actual logistical performance from the planned indicators – specifically regarding the correspondence of the company's position to the desired future state–the methodology allows for rapid corrective decisions . This ensures that the planning system remains flexible and that the production and logistics outputs are continuously aligned with market needs and the dynamic external environment.

3. Results and discussion

The results of the study confirm that the primary methodological challenge in planning the development of capabilities, particularly in the context of logistical potential within machinery building enterprises, remains the effective integration of plans with differing time horizons and objectives. While the management system of a large company typically operates in strategic and current management modes, the prevalent two-element system (strategic vs. operative) has proven non-viable under dynamic external conditions[3]. This failure stems from a clear detachment between long-term strategic goals for logistical potential enhancement and day-to-day operational logistics tasks.

Our core finding is the substantiation and architectonic development of a multi-level planning system designed to systematically raise the logistical potential of an enterprise. This proposed approach is viewed within the framework of overall strategic management and planning. The system is defined by its ability to unify and generalize all varieties of planning activities–including long-term, medium-term, current (annual), and operative planning–into an integrated structure.

3.1. Multi-Level Structure of the Planning Process

The planning process for improving logistical potential must be simple to understand, yet robust enough to manage complexity[8]. The proposed system resolves this by dividing the entire planning cycle into a sequence of five logically connected stages, ensuring clear accountability and defined activities at each phase:

1. Forecasting (Stage 1): Analysis of the future logistical, market, and technological landscape.
2. Selection of Optimal Variant (Stage 2): Determining the most advantageous path for development based on the forecast.
3. Strategic Planning (Stage 3): Formulation of long-term goals for logistical potential and setting final achievement deadlines.
4. Program Development and Scheduling (Stage 4): Transformation of strategic goals into detailed programs and functional plans (e.g., transport plans, warehousing modernization schedules).
5. Budgeting and Control (Stage 5): Resource valuation, allocation, and a continuous feedback loop for necessary corrections.

This phased approach facilitates the transition from broad strategic analysis to concrete operational implementation.

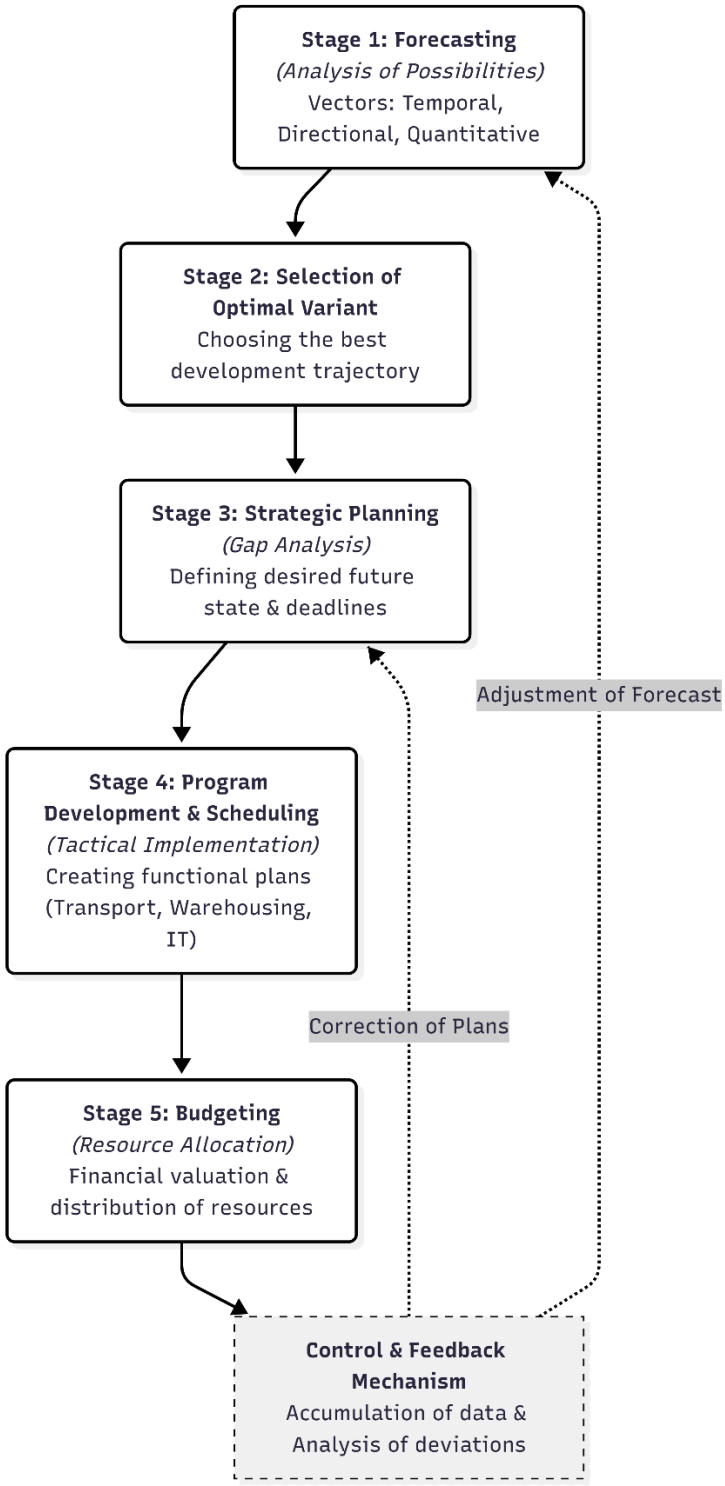

Figure 1: Stages of the multi-level planning process for logistical potential improvement*
**Source: Developed by the Author*

3.2. Forecasting and Strategic Goal Setting in Logistics

A central result of our analysis is the clear distinction between forecasting and long-term planning. Forecasting aims to accurately define the future situation (economic, legislative, technological, and logistical) [16], utilizing a three-vector approach:

- Temporal Vector: The time horizon of logistical trends (e.g., adoption timeline for automated warehousing).

- Directional Vector: Possible future tendencies in supply chain management (e.g., shift to nearshoring or increased use of digital twins).
- Quantitative Vector: Defining the degree of expected changes in logistical metrics (e.g., required inventory turnover increase or delivery speed improvement).

The results of forecasting provide a critical base. Long-term planning then takes this base and develops the desired future state of the enterprise's logistical potential, expressed in concrete, quantified data. This desired state is then compared with the current state using the gap analysis method, which highlights the necessary growth in logistical capacity. The strategic plan (Stage 3) is, therefore, the documented commitment to close this gap by enhancing the various components of the logistical potential.

3.3. Integration of Planning Levels and Development Resources

The success of the multi-level system hinges on the effective transition from long-term to medium-term and annual planning. The strategic management, as the generalization of all planned activities, ensures that operational and current management decisions are justified primarily from the perspective of tomorrow's logistical requirements. This tight linkage (or "tight coupling") of all elements ensures that the production and logistics outputs are constantly aligned with dynamic market needs.

Furthermore, the implementation of plans and strategies for raising logistical potential requires the mobilization of the enterprise's existing resources and capabilities. The system must explicitly account for the possibility of attracting both internal and external sources of development. For example, budgeting (Stage 5) must include the financial valuation of the development program and the distribution of resources, including external sources such as bank credits, which are vital for significant logistical infrastructure investments in highly developed countries.

3.4. Components of Logistical Potential and Development Priorities

To effectively manage the development program (Stage 4), the overall logistical potential must be decomposed into its key functional components. This allows for targeted interventions and the creation of specific functional plans (transport, warehousing, information systems). Table 1 outlines the structural components of logistical potential and their corresponding development priorities within the multi-level planning framework, particularly relevant for the machinery building sector.

Table 1: Structural Components of Logistical Potential and Development Priorities*

Component of Logistical Potential	Typical Indicators (Examples)	Priority Development Goal	Role in Multi-Level Planning
Logistical Infrastructure (Material-Technical Base)	Warehousing capacity utilization, equipment wear level, fleet modernity	Modernization and expansion of fixed assets (e.g., automated warehousing, modern vehicle fleet).	**Long-Term Strategic Plan:** Sets targets for asset renewal and scale.
Information Systems and Digitalisation	Degree of WMS/TMS integration, use of data analytics for demand forecasting, information security.	Implementation of advanced IT systems to enable real-time tracking and decision-making.	**Medium-Term Tactical Plan:** Details IT project implementation phases and costs.
Inventory and Supply Chain Management	Inventory turnover rate, stock-out frequency, lead time, supplier reliability.	Optimization of inventory holding policies and diversification of supply channels to minimize risk.	**Annual/Current Plans:** Sets seasonal inventory targets and purchasing contracts.
Human Capital (Logistics Specialists)	Staff qualification level, share of specialized certifications, training intensity.	Development of specialized competencies in supply chain resilience, IT, and process optimization.	**Program Development:** Defines training schedules and recruitment needs.
Organizational-Managerial (Planning System)	Flexibility of organizational structure, quality of strategic planning, coherence across functional plans.	Ensuring vertical and horizontal integration of all planning activities (long-term to operative).	**Control/Feedback:** Monitors alignment between the plan and actual logistical performance.

** Source: Compiled from [5; 8; 9; 11]*

3.5. The Control and Feedback Mechanism

The final and continuously operating stage is **Control**. This stage is not merely a post-mortem review but a real-time accumulator and analyzer of data on the progress of all planning stages. By comparing the realized logistical performance against the goals set in the strategic and tactical plans, the system can quickly determine the correspondence of the company's current logistical position to the desired future state.

The control mechanism ensures the inherent flexibility of the entire system[35]. Based on the analysis of deviations, decisions are made regarding **the necessary correction or modification of the** implemented programs[36]. This closed-loop process ensures that the multi-level planning system for enhancing logistical potential is adaptive, resulting in an integrated system for decision-making that is crucial for sustained competitiveness in a highly volatile market environment.

4. Conclusion

The research presented successfully addresses the critical methodological gap between strategic intent and operational execution by substantiating a Multi-Level Planning System for the Improvement of Enterprise Logistical Potential. The study demonstrated the inadequacy of a simple two-element management structure in a volatile market, where a persistent detachment exists between long-term logistical development goals and current operational tasks.

The key result is the proposed five-stage planning architectonics, encompassing Forecasting, Optimal Variant Selection, Strategic Planning, Program Development, and Budgeting/Control. This structure not only clarifies the planning process but also ensures the vertical and horizontal integration of all planning activities across different time horizons. A crucial methodological contribution is the clear distinction between the three-vector forecasting (defining the future environment) and the function of strategic planning (using gap analysis to define the desired logistical potential).

Ultimately, this multi-level system creates an adaptive, closed-loop mechanism. The final stage of Control and Feedback allows for continuous monitoring of deviations and necessary adjustments, ensuring that the enterprise's accumulated logistical potential and operational outputs remain synchronized with dynamic market requirements and strategic growth objectives. This provides a robust and flexible framework for managing complex logistical modernization projects.

5. References

[1]. Ansoff, H. I. (1989). *Strategic management*. Palgrave Macmillan.

[2]. Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2012). *Supply chain logistics management* (4th ed.). McGraw-Hill.

[3]. Chernikov, D. A. (2001). Efficiency of using production potential and final national economic results. *Economic Sciences*, *10*, 14–18.

[4]. Christopher, M. (2016). *Logistics & supply chain management* (5th ed.). Pearson Education. https://doi.org/10.1201/9781315381669

[5]. Fedonin, O. S., Repina, I. M., & Oleksyuk, O. I. (2003). *Potential of the enterprise: Formation and assessment*. KNEU.

[6]. Gradov, A. P. (Ed.). (1995). *Economic strategy of the firm*. Special Literature.

[7]. Harrison, A., & van Hoek, R. (2008). *Logistics management and strategy* (3rd ed.). Prentice Hall.

[8]. King, W. R., & Cleland, D. I. (1978). *Strategic planning and policy*. Van Nostrand Reinhold.

[9]. Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson.

[10]. Maksimov, V. V. (2002). *Economic potential of the region: Analysis, assessment and use*. SNU named after V. Dahl.

[11]. Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.

[12]. Shevchenko, D. K. (2004). *Problems of efficiency of using economic potential*. KPU.

Information about authors

Sergii Vyshniuk, PhD student, Khmelnytskyi National University, Khmelnytskyi, Ukraine.
ORCID: https://orcid.org/0009-0008-7764-9760, e-mail: inter.econom.khnu@gmail.com

Halyna Skyba, lecturer, International Economic Relations Department, Khmelnytskyi National University, Khmelnytskyi, Ukraine.
ORCID: https://orcid.org/0000-0003-3521-4140, e-mail: ijournales@gmail.com