

## Conference Paper

# Inventory Accounting System Using System Engineering Methods

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**Abstract**

The article presents models of inventory accounting led by a project manager and system engineer. The project "Inventory accounting system using system engineering methods" is aimed at the formation of a separate inventory accounting system in the development, manufacture and production of products. In the framework of Ural Diesel Engine Plant LLC, such records are kept only for expensive components that are delivered with military acceptance in the context of each contract for each state contract. Even with such accounting at the enterprise, there is a problem of making small profits or lack of profit from the manufacture of military diesel generators. In developing my project, I would like to improve the system of accounting and writing off inventory items supplied with military acceptance, and later using this system for the entire list of components that make up the product.

**Keywords:** systems engineer, project manager, lifecycle, management basics, separate accounting, management accounting, operational accounting, successful accounting system

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## 1. Introduction

Systems engineering is focused on a comprehensive review of the full life cycle of the system, including providing the specified functionality and characteristics, adhering to estimates and work schedules, verification, production and maintenance, personnel training, decommissioning and disposal of the system. Within the framework of this approach, a unified methodological basis has been formed for describing all processes of the systems life cycle. The most complex and intricate relationships in a historical perspective exist between systems engineering and project management. Both disciplines have apparently similar goals and objectives, both claim to cover a range of problems associated with the creation and operation of complex systems of various nature. At the same time, these disciplines arose and developed independently and relatively independently, developing their own conceptual framework, their own standards, their own system of training and certification, etc (1-4).

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If the project manager is mainly focused on the work flow, then the system engineer is mainly on the target system, while in general the difference between the two types of activity is significant, it is impossible to draw an unambiguous, deterministic border between them

In this regard, it is appropriate to mention that since the 1990s. There is a gradual convergence between systems engineering and project management, and recently the question of their mutual influence and penetration is in the stage of active solution. One of the signs and at the same time a consequence of this process is that absolutely all the classical project management processes are included in the key system engineering standard –ISO / IEC 15288 (5-8).

## 1.1. Fundamentals of management, enterprise accounting system

The management of the enterprise in modern conditions should perceive the accounting system as an instrument of strategic management. Accounting serves as a means to business success. The effectiveness of accounting systems should be judged in the light of their impact on the success of the enterprise. The general accounting system should be consistent with the enterprise strategy.

Only in this case will the overall accounting system be able to bring maximum benefits to the organization and ensure success in the competition.

At present, a four-level accounting regulatory system has been formed in Russia:

- 1 level. Federal laws, government decrees, decrees of the President.
- 2 level - are the provisions (standards) on accounting, which set out the principles and basic rules of accounting.
- 3 level - instructions, recommendations and guidelines for accounting, which are adopted by the Ministry of Finance of the Russian Federation, federal executive bodies.
- 4 level - internal working documents of the enterprise - organizational and administrative documents that form the accounting policy of the enterprise, which are developed by the enterprise itself. These are orders, instructions, work instructions, instructions for accounting for specific objects and operations (within the competence of the organization's management).

At the 4 level of the regulatory system there is such a thing as operational accounting of inventory items, which is maintained at the entire stage of the production process of the final product manufactured at the enterprise.

## 1.2. The value of systems engineering in the accounting system of goods and materials

Is it necessary to use system engineering in the accounting system of goods and materials at the enterprise? To account for inventories at each enterprise, a special program is used, in particular 1C. Each accounting system involves the use of certain functionality from the departments of the enterprise involved in this process. Operational accounting write-off of goods and materials to order (Fig.1). Are knowledge, skills of a system engineer needed here?

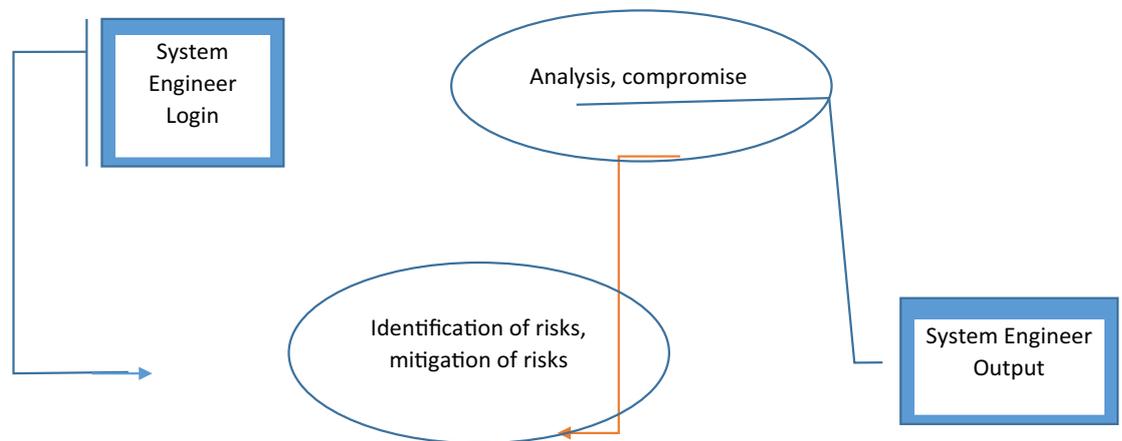
The knowledge of the system engineer and his vision of the system as a whole is needed even at the stage of signing an agreement with the Customer and Suppliers of products used as part of the final product. Each structural unit of the enterprise has its own goals and objectives when negotiating an agreement with both the Customer and the Supplier. When considering draft contracts, as a rule, several services participate, and each one makes adjustments concerning and taking into account the goals and objectives of its unit(3-4).

And already here at this stage, the introduction of systems engineering and its methods is not enough, providing the requirements of the entire project and the system as a whole. Although everywhere it is generally accepted that financial and contract management is the functional of a project manager. Both the project manager and the system engineer should assess the risks and mitigate the risks at the stage of agreement approval. When developing and using any system, it is important that all key participants in the process not only know their field of activity, but also understand how to interact with each other (Fig.2).

The main function of systems engineering is to ensure that all the many project participants understand their responsibilities to each other. This is an exact analogue of the system engineering function to determine the interactions between parts of the system in such a way that they correspond to each other and work smoothly.

	Participatory unit	The result of the work of the participatory unit
Contract with the Customer	Sales department	The contract on favorable terms
Contract with the Supplier	procurement	The contract, taking into account the functions, goals and objectives of its unit
Storage facilities	warehouse	Received the products and put them into storage on demand
Manufacturing process	planning department	Received at the time of involvement in production
Final products	Finished goods warehouse	Packed, sent

Figure 1: Write-off of goods and materials without system engineering



	Participatory unit	The result of work involving a system engineer
Contract with the Customer	Sales department	The contract on the terms of the customer and the main suppliers involved in the implementation of this project
Contract with the Supplier	procurement	Contract on the terms of the Supplier and the Customer
Storage facilities	warehouse	I received the products and put them into storage on demand, writing off the necessary order
Manufacturing process	planning department	Received at the time of involvement in production, avoiding non-compliance and reports to the representative of the Customer
Final products	Finished goods warehouse	Packed, sent, excluding comments on the incoming control at the Customer

Figure 2: Write-off of goods and materials using systems engineering methods

In general, the development result is of great practical importance for the effective project management at the enterprise and obtaining large profits from the final products sold. Partnership, the joint efforts of the structural units involved in the production process under the supervision of a system engineer are key factors for ensuring the company's profit. The article was prepared as part of the project "System of inventory accounting at the enterprise using the methods of system engineering", implemented at the enterprise Ural diesel engine plant LLC.

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