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INTERNATIONAL SCIENTIFIC ELECTRONIC JOURNAL

IMPROVING THE SCIENTIFIC AND METHODOLOGICAL APPROACHES TO THE FUNCTIONAL CLASSIFICATION OF INVENTORIES IN COMMUNICATION ENTERPRISES

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Abstract. The article examines the improvement of scientific and methodological approaches to the classification of inventories specific to telecommunications enterprises. The views of economists on inventory classification, as well as the classifications provided in National Accounting Standard No. 4 and IAS 2, are critically analyzed. It is substantiated that these approaches are mainly based on the industrial production paradigm and do not fully correspond to the service-infrastructure nature of the telecommunications industry.

As a result of the research, a scientific and methodological approach is proposed for classifying telecommunications inventories into five groups based on their functional role in the network and economic substance: network infrastructure inventories, subscriber sales inventories, installation materials, repair spare parts, and auxiliary consumables. Based on empirical data from Uzbektelecom JSC for 2022–2025, the practical significance of the proposed classification for organizing accounting, inventory valuation, stocktaking, and identifying audit risks is revealed.

Keywords: inventories, classification, functional groups, telecommunications enterprises, network infrastructure, subscriber sales inventories, accounting, stocktaking, audit risks.

Аннотация. В статье исследованы вопросы совершенствования научно-методических подходов к классификации запасов, характерных для предприятий телекоммуникационной отрасли. Проведён критический анализ взглядов отечественных и зарубежных экономистов на классификацию запасов, а также классификационных подходов, закреплённых в Национальном стандарте бухгалтерского учёта № 4 и МСФО (IAS) 2. Обосновано, что существующие подходы преимущественно основаны на промышленно-производственной парадигме и не в полной мере учитывают сервисно-инфраструктурный характер деятельности предприятий телекоммуникационной отрасли.

По результатам исследования предложен научно-методический подход к классификации запасов телекоммуникационных предприятий по пяти функциональным группам в зависимости от их роли в сети и экономического содержания: запасы сетевой инфраструктуры, абонентско-сбытовые запасы, монтажные материалы, запасные части для ремонта и вспомогательные расходные материалы. На основе эмпирических данных АО «Узбектелеком» за 2022–2025 годы раскрыто практическое значение предложенной классификации для организации бухгалтерского учёта, оценки запасов, проведения инвентаризации и выявления аудиторских рисков.

Ключевые слова: запасы, классификация, функциональные группы, предприятия телекоммуникационной отрасли, сетевая инфраструктура, абонентско-сбытовые запасы, бухгалтерский учёт, инвентаризация, аудиторские риски.

INTRODUCTION

The issue of proper inventory classification in the communications sector is particularly relevant due to several objective factors. First, the rapid transition of equipment from one generation to another, such as 3G → 4G → 5G, creates a high risk of obsolescence for certain groups of resources, and this risk differs significantly across inventory categories.

Second, the heterogeneous storage of similar types of equipment supplied by different vendors, including Huawei, Ericsson, Nokia, ZTE, and others, as well as their distribution across thousands of geographical locations, complicates inventory and control processes.

Third, the very high turnover of SIM cards and scratch cards, amounting to 12–14 million units per year, requires their separation from other resources and accounting under a distinct control regime (ITU & UNITAR, 2024; BCG, 2023).

Under these conditions, classification goes beyond theoretical discussion and becomes a directly practical issue affecting accounting, valuation, inventory management, and audit effectiveness.

LITERATURE REVIEW

The classification of inventories is one of the classical issues in accounting theory, and various approaches to this matter have been developed in the literature.

Hendriksen and Van Breda interpreted inventory classification as a primary condition for selecting an appropriate valuation method (Hendriksen and Van Breda, 2000).

Needles, Anderson, and Caldwell proposed classifying inventories according to the type of enterprise activity and developed separate classification schemes for trading and manufacturing enterprises (Needles, Anderson, and Caldwell, 2004).

Gates classified inventories in an industrial enterprise into three groups: production inventories, work in progress, and finished goods (Gates, 2018).

Levkovich and Burtseva defined inventories as production elements used as objects of labor, intended for processing or production in order to create new use value, and linked their classification specifically to the stages of the production cycle (Levkovich and Burtseva, 2019).

Schreibfeder proposed grouping inventories from the perspective of management objectives, particularly according to the nature of demand and turnover rate (Schreibfeder, 2016).

RESEARCH METHODOLOGY

The research employed scientific abstraction, induction and deduction, grouping and comparison, systematic and comparative analysis, economic-statistical analysis, and objective observation methods.

A functional approach was applied to justify the classification criteria. Each type of inventory was evaluated according to its role in network operations, turnover cycle, location characteristics, and risk of impairment.

ANALYSIS AND RESULTS

To justify the need for classifying inventories specific to communications enterprises, it is first necessary to assess the development dynamics of the sector. The main indicators of Uzbekistan's communications sector for 2022–2025 are presented in Table 1.

Table 1

Dynamics of key indicators of the communications sector of Uzbekistan (2022–2025)[1]

Index	2022.	2023.	2024.	2025.
Number of Internet users, million people	27.2	29.8	31.5	33.1
Number of active mobile connections, mln	31.2	32.4	33.6	33.9
Number of base stations, thousand units	31.7	35.8	41.2	46.5
Volume of telecommunication services, trillion soums	13.2	18.1	21.0	24.8
Income of JSC «Uzbektelecom», trillion soums	6.1	7.6	9.0	10.2
Industry growth rate, % (annual)	10.1	12.8	16.0	14.6

This table shows that the number of base stations increased by 46.7%, from 31.7 thousand to 46.5 thousand units in 2022–2025. Considering that, on average, 50–80 types of equipment and spare parts are required for the installation of each new base station, at least 750 thousand items of equipment and spare parts were recorded in accounting for the 14.8 thousand base stations added during this period alone.

Managing such a large inventory nomenclature within the framework of the traditional four-category classification is practically difficult. Therefore, a deeper grouping of inventories based on functional characteristics becomes an objective necessity.

1 It was compiled by the author based on the information of the National Statistics Committee and "Uzbektelecom" JSC

At the next stage, the existing classification approaches presented in economic literature and regulatory documents were systematized, and their applicability to the communications sector was assessed. The results of the analysis are summarized in Table 2.

Table 2
Existing approaches to the classification of inventories and their relevance to the field of communication[2]

Author / source	Classification approach	Suitability for the field of communication
I.V. Geitz	Three types: production stocks, work-in-progress, finished goods	Limited — there is almost no work-in-progress and finished goods in the communications service
O.A. Levkovich, I.N. Burtseva	Grouping by production cycle stages	Limited — does not reflect the continuity of the service cycle
J. Schreibfeder	By nature of demand and turnover rate (management approach)	Partially compatible - not linked to the accounting system
4th edition of the BHS	Four categories: raw materials and supplies; work in progress; finished product; goods	Limited — SIM card, terminal equipment, and network spare parts are combined into one category
BHS 2	Three categories: for sale; in the production process; consumed in production/service	Partially compatible - covers service domain but does not provide network analytics
The author's approach	Five functional groups: by network function, turnover cycle, location and impairment risk	Fully compatible — integrates accounting, valuation, inventory, and audit needs

This table shows that existing classifications are based either on the stages of the production cycle or on generalized areas of consumption. In a communications enterprise, the "product" is a continuous network service, and the role of inventories is not to be transformed into a final product, but to create, maintain, expand, and deliver the network service to subscribers.

Therefore, the classification criterion should be shifted from the production cycle to the functional role of inventories within the network. Based on this logic, a scientific and methodological approach has been developed for classifying inventories specific to communications enterprises into five functional groups, as presented in Table 3.

Table 3
Comparative characteristics of functional groups of inventories specific to communication enterprises[3]

No.	Group name	Examples of basic content	Rotation cycle	Location	Impairment risk
1	Network-infrastructure reserves	Base station modules, optical cables, switches, routers, antennas	Long (3–7 years)	Base stations	High (3G→5G)
2	Subscription-sale stocks	SIM cards, scratch cards, subscriber terminal equipment (router, IPTV)	Short (1–6 months)	Sales points, warehouses	Low
3	Installation materials	Cable couplings, connectors, sockets, protection devices	Disposable	Construction and assembly brigades	Average
4	Spare parts	Circuit boards, capacitors, power supply units	On demand	Regional branches	Average
5	Consumables	Generator fuel, work clothes, stationery, cleaning products	Permanent expense	All divisions	Low

The methodology for dividing inventories into five groups is based on the following logic. The first group, network infrastructure inventories, forms the physical basis of the network and has a long turnover cycle, usually ranging from 3 to 7 years. This group is most exposed to the risk of functional obsolescence caused by changes in technological generations, which requires regular monitoring in accordance with the requirements of IAS 36.

2 Prepared by the author
3 Author development

The second group, subscriber sales inventories, consists of products sold or distributed directly to subscribers. Their turnover cycle is relatively short, ranging from several weeks to six months, while the volume of turnover is very large. For example, SIM cards alone account for 12–14 million units per year.

The third group, assembly and installation materials, includes one-time-use materials consumed during network expansion or reconstruction, and their movement is directly related to capital construction projects. The fourth group, spare parts, is kept in reserve to ensure the uninterrupted operation of existing equipment, and demand for these items is stochastic. The fifth group, auxiliary consumables, does not directly perform the main network function but supports auxiliary business processes.

All five groups share four common features: subordination to the network function, geographical dispersion, exposure to rapid technological obsolescence, and vendor dependence. At the same time, they differ significantly in terms of turnover cycle, location characteristics, and risk level. These differences require differentiated accounting, valuation, and control decisions for each group.

The linkage of the proposed classification with the accounting and analytical infrastructure is presented in Table 4, where the recommended valuation method, accounts, inventory regime, and priority audit risks are identified for each group (Table 4).

Table 4

Application of the five-group classification to accounting, valuation, inventory and audit processes[4]

Group	Evaluation method	Accounts receivable	Inventory mode	Priority audit risks
Network infrastructure	Identification (private cost)	1010, 1040; returned - 2818	Annual full; with RFID/barcode	Concealment of functional impairment; physical presence
Subscriber sales	Average cost (AVECO)	1018, 1019, 2910	On a quarterly basis	SIM reuse; scratch abuse
Assembly and installation	FIFO	1010, 1090	At the end of the project	Excess write-off
Maintenance	Identification	1040	Semi-annual	Cable and parts theft
Assistant-consumer	Average price	1050, 1090	Annual	Personal use

The adaptation matrix presented in this table demonstrates the practical value of the proposed classification. In particular, linking the valuation method to group characteristics has a significant impact on financial reporting indicators. A practical calculation for SIM cards showed that the difference between the FIFO method and the weighted average cost method for a batch of 600 thousand units may amount to UZS 51–66 million. Applying the specific identification method to high-value network infrastructure equipment, where the cost of a single base station module exceeds UZS 130 million, enables individual tracking of each device by serial number and IMEI, making it possible to identify impairment at the device level.

The empirical testing of the proposed classification was carried out using data from Uzbektelecom JSC. When the company's inventories were regrouped according to the five-group classification, it was found that by the end of 2025, out of total inventories of UZS 1,363 billion, UZS 614 billion or 45.0% were attributed to network infrastructure inventories; UZS 298 billion or 21.9% to subscriber sales inventories; UZS 205 billion or 15.0% to installation materials; UZS 164 billion or 12.0% to spare parts; and UZS 82 billion or 6.1% to auxiliary consumables.

An important point is that monitoring the dynamics for 2022–2025 by functional groups became possible precisely due to the introduction of the proposed classification. Under the traditional classification, for example, network infrastructure inventories with a high risk of obsolescence would be combined into a single indicator with low-risk auxiliary materials, making the risk profile invisible to users of financial statements.

International practice also confirms the relevance of functional grouping. In the financial statements of Vodafone, Orange, and Deutsche Telekom, notes on inventories are disclosed separately for network equipment, subscriber devices, and other materials, while accounting is carried out through network-specific ERP systems such as SAP for Telecommunications and Oracle Communications (Kuzovkova, Volodina, and Kukharenko, 2017). In such systems, functional groups form the basis of the data architecture. Thus, the proposed five-

4 Author development

group classification also serves as a bridge that brings national accounting practice closer to international standards and the requirements of digital accounting systems.

Another important practical direction of the classification is the enrichment of notes to the financial statements. While the world's largest telecommunications operators present inventory notes divided into 8–10 sections, Uzbektelecom JSC currently limits disclosure to standard categories. Restructuring the notes based on the five-group classification provides users of financial statements with qualitatively new information about the liquidity level, obsolescence risk, and turnover rate of inventories. It also serves as a positive factor in the process of obtaining international credit ratings for the company.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, the following conclusions and recommendations were formulated.

First, approaches to classifying inventories in economic literature and regulatory documents are mainly based on the industrial production paradigm and do not fully correspond to the service-infrastructure nature of the communications sector. In a communications enterprise, the role of inventories is not to be transformed into tangible products, but to ensure the creation, uninterrupted operation, expansion, and delivery of network services to subscribers. Therefore, the classification criterion should be shifted from the production cycle to the functional role of inventories within the network.

Second, the scientific and methodological approach to classifying inventories specific to communications enterprises has been improved by grouping them into five categories according to their functional role in the network and economic substance: network infrastructure inventories, subscriber sales inventories, assembly and installation materials, spare parts, and auxiliary consumables. Each group is clearly identified by its turnover cycle, location characteristics, and impairment risk, which makes it possible to differentiate accounting decisions across inventory groups.

Third, the application of the proposed classification within the accounting and analytical infrastructure has been substantiated. For each group, the appropriate valuation method has been determined: specific identification for network infrastructure inventories and spare parts, weighted average cost for subscriber sales inventories and auxiliary consumables, and FIFO for assembly and installation materials. In addition, relevant accounts, inventory procedures, and priority audit risks have been identified. Empirical testing using the example of Uzbektelecom JSC confirmed that group-based analysis makes the composition of inventories and their risk profile more transparent for users of financial statements.

Fourth, it is recommended to include this classification in the accounting policies of Uzbektelecom JSC and other communications operators, expand the notes to the financial statements on its basis, and develop methodological recommendations at the level of the sectoral ministry.

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