CENTRAL ASIAN JOURNAL OF INNOVATIONS ON TOURISM MANAGEMENT AND FINANCE

https://cajitmf.centralasianstudies.org/index.php/CAJITMF

Volume: 06 Issue: 01 | January 2025 ISSN: 2660-454X

Article

Innovative Automation Solutions for Accounting of Production Costs for Cotton and Textile Clusters

Khalikov Talibjon Luptullaevich[*1]

1. Assistant at the department of "Accounting and Auditing in Other Industries", Samarkand Institute of Economics and Service

* Correspondence: xoliqov0220@mail.ru

Abstract: This article discusses an algorithm for automated accounting of the receipt, storage and consumption of raw cotton in riots of a cotton processing plant. To obtain an objective picture of the actual cost of finished products, the company uses various methods of cost allocation in relation to departments and cost items. Most industrial enterprises use semi-finished products of their own production (multi-transfer cycle) for production. As a rule, this is reflected in the construction of accounting and production accounting. At the same time, in order to optimize production processes, it is necessary to know the actual cost of production, as well as the factors influencing its change.

Keywords: Automated Accounting Algorithm, Raw Cotton, Accounting for Material Flows, Accounting for The Movement of Material Flows

Citation: Luptullaevich, K. L. Innovative Automation Solutions for Accounting of Production Costs for Cotton and Textile Clusters. Central Asian Journal of Innovations on Tourism Management and Finance 2025, 6(1), 281-286.

Received: 13th Jan 2025
Revised: 24th Jan 2025
Accepted: 30th Jan 2025
Published: 21th Feb 2025

1. Introduction

The Accounting for the flow of raw materials at enterprises, in particular cotton processing, is the basis for operational (calendar) planning, management and accounting of production and reflects the results of management of production processes for operational periods of time [1].

The main material flows with a discrete-continuous nature of the production process in a cotton processing plant are modifications of a batch of raw cotton [1]. In accordance with this, the basis of material accounting at these enterprises is the measurement of the instant modification costs of the processed batch of raw cotton, intermediate and final products and their quantity in warehouses. An analysis of the existing systems of material accounting and balance in production conditions at many cotton processing enterprises has shown that its implementation is associated with a large number of measurements and processing of their results, carried out mainly manually [2]. This situation in enterprises is largely due to the lack of automated control tools that meet the requirement of accounting for material flows.

The operational management of the main production of a cotton processing enterprise performs the functions of maintaining the facility on a phase trajectory and is a set of information processes for developing control actions that ensure more effective achievement of set targets within a specified time based on the results of a deterministic model of the main production developed for this enterpris [3].

Equipping cotton processing enterprises with modern primary information tools to account for the material flows of a batch of raw cotton in combination with telecommunications and microprocessor (industrial controllers) technology allows for the transition to more modern forms of management (automated enterprise information systems) [3].

In this case, optimal control of the production process is a very time-consuming task. The main mechanism here is planning. An automated solution to such a problem makes it possible to plan competently and effectively, take into account costs, carry out technical preparation of production, and promptly manage the process of producing cotton products in accordance with the production program and technology [4]. Obviously, the larger the production, the more business processes are involved in creating profits, which means that the use of automated information systems is vital [5].

The information system that solves the tasks of operational management of a cotton processing enterprise is based on a database in which all possible information about this enterprise is recorded [6]. Such an information system is a business management tool, usually referred to as a corporate information system. The operational management information system includes a lot of software solutions for automating business processes that take place in a given enterprise [7].

It can be argued that in the fierce competitive struggle of market relations, an enterprise that uses modern information technologies in management has a great chance of winning. At the same time, it becomes possible to centralize the control and management of production, technological processes, and warehouse facilities of an enterprise from a single point and, as a result, significantly improve the quality of coordination of relationships between individual product fleets, pumping, pneumatic, and technological installations [7]. The use of a centralized management system based on information technology methods for production processes makes it possible to improve the quality of information received, its reliability and timeliness [8].

The Main Part

The development and implementation of an automated information system for processing data in a cotton processing plant can be carried out in three stages.

At the first stage of using an automated information system for processing data, information about the movement of raw cotton in pneumatic transports and in production is sent to the information system server via the client server of the system on site. Based on these data, IT solves a set of production, organizational, economic and technological tasks [9].

The data processing system becomes more efficient in the second stage of the information system development. Here it is necessary to automate calculations of daily balances, production and marketing of raw cotton products. It is necessary to develop and influence a well-established document management system that reflects the current production activities actually taking place at the enterprise. Ready-made systems, processed data, and management advisory information are provided to the management staff by the beginning of the working day (or on demand) [9].

At the third stage of its development, the automated information system is used to fully cover all the functions of managing the main production, including current (calendar) planning and operational management. For this reason, the automated information system being developed to account for the flow of raw cotton from a cotton processing plant undoubtedly makes it possible to increase management efficiency [10].

The control system performs the following functions:

a. remote measurement of the consumption of raw cotton feedstock in pneumatic transports;

b. connection of the selected raw cotton batch being processed to the pneumatic transport pipeline;
c. transportation of marketable products, cotton products for sorting and packaging further to the warehouse;
d. accounting for the receipt of raw cotton modification at the plant;
e. shipments of finished products, receipt of raw cotton to the workshop and processing; accounting for the remnants of raw cotton;
f. calculation of material balances for installations and plant;
g. control of pumping units; speed control of pneumatic transport, etc [11].

The system is based on the use of means of group measurement of expenses, level, speed of movement of raw cotton in pipelines of pneumatic transport and control IT [11]. The application of an information system for a given enterprise requires the development of appropriate software, which includes the following modules (objects):

a. Calculation of the amount of raw cotton in riots (raw cotton storage);
b. Performing various operational accounting functions (accounting for the receipt of raw materials at the plant, grain receipts for processing, calculation of material balances for installations (units, machines) and the plant, accounting for the remnants of raw materials, final products and intermediates at the beginning and end of shifts, days, months, accounting for the shipment of finished products) [12].

2. Materials and Methods

Raw Material

The cost of raw materials (basic, weft and other types of yarn) spent on the annual production of fabric is determined from the value balance of raw materials. The absolute value of the cost is obtained as the difference between the cost of yarn supplied to production and the cost of waste received.

Materials

This cost item in the cost of weaving production mainly includes the cost of materials used for the preparation of dressings and emulsions. The absolute value of these costs is determined for each article of harsh fabric as the product of the amount of materials consumed by their prices according to the current price lists.

3. Results

Let's consider an algorithm for accounting for the receipt, consumption and storage of raw cotton in the riots of a cotton processing plant.

Figure 1 illustrates an algorithm for accounting for the movement of raw materials and final products, detailing the process of tracking raw cotton storage and its subsequent movement. The process begins with a survey that memorizes the states of rebellion where raw cotton is stored. An analysis of the type of change follows, categorizing it as either extraordinary or regular.

If the change is extraordinary, a comparison of the current state of rebellion with the previous state is conducted. If no changes are detected, the process continues with routine monitoring. However, if changes are identified, the algorithm records the riot number, stores the current operating mode of the equipment, registers a change in the H_i level in the i-th riot of raw cotton storage, and determines the weight b_i of raw cotton in the i-th riot.

For regular changes, the process involves making a fixed change in the H_i level in the i-th riot of raw cotton, followed by determining the weight of raw cotton Q_i in the i-th riot. Another survey is then conducted, which leads to the selection of an accounting algorithm.

The accounting algorithm is chosen based on three scenarios: expenditure, keeping, or entrance. In each case, the quantity change is calculated using the formula $\Delta Q_i = Q_{i-1} - Q_i$. The results are then output, leading to the conclusion of the process.

This algorithm provides a structured approach for systematically monitoring, analyzing, and accounting for changes in the storage and movement of raw materials and final products within a cotton processing system.

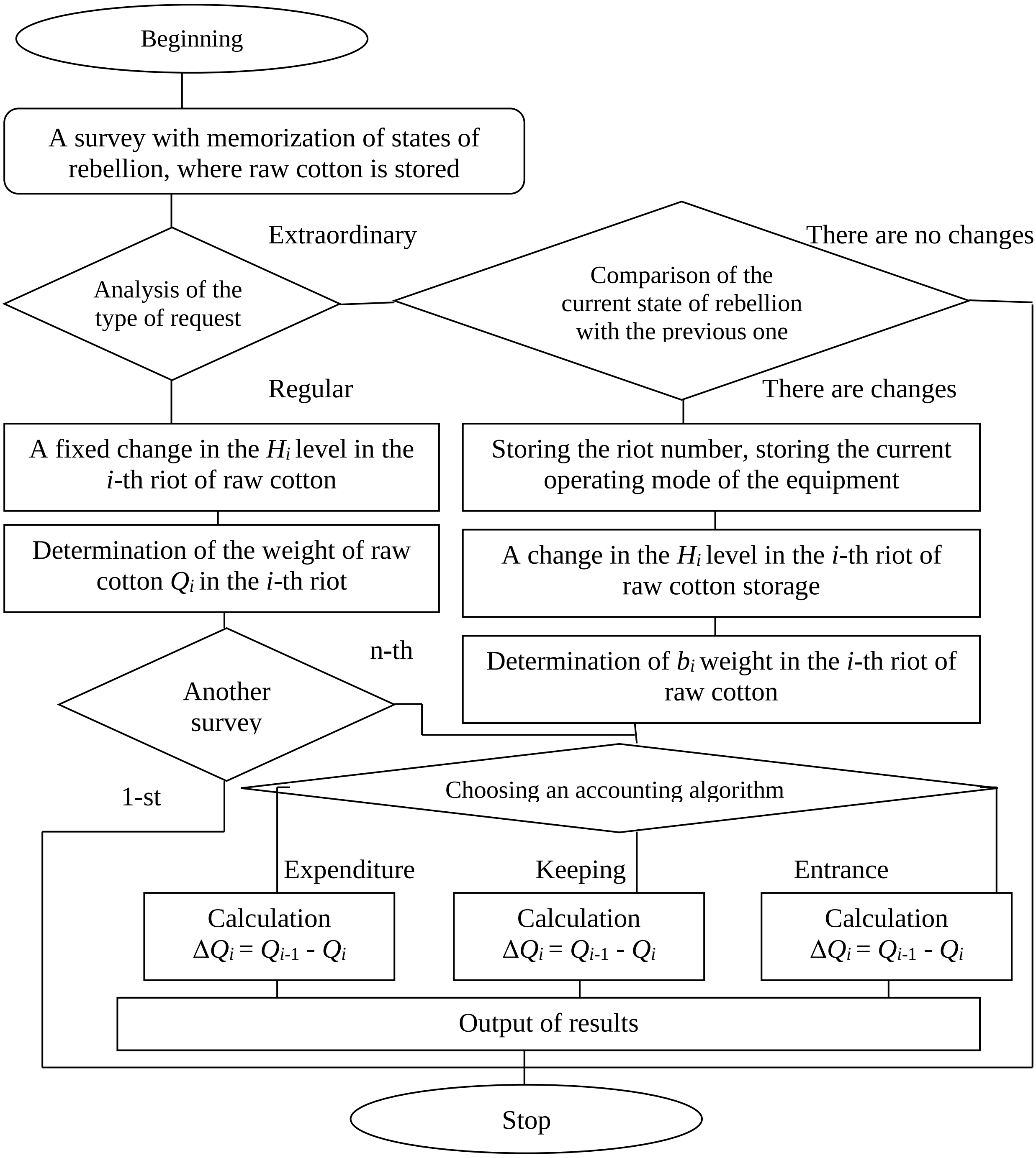

Figure 1. Algorithm for accounting for the movement of raw materials and final products.

4. Discussion

Let there be k storage riots for raw cotton, which feed some γ-th installation, which receives batches of raw cotton. The position signals (opening or closing) of the input and output valves of each revolt are automatically sent to the computer of the information system [13].

A block diagram of the algorithm for accounting for the movement of raw cotton material flows in the technological process of a cotton processing plant is shown in the figure. Let's introduce the notation:

a. t_0 – start of the next survey (start of shift);
b. t_k – end of the next survey (end of shift);
c. $t_{ij'}$ – closing of the inlet valve, *j*-th riot at the *i*-th moment;
d. t_{ij} – closing of the exit valve, the *j*-th revolt at the *i*-th moment;
e. l – the number of surveys during T (shift, day, month).

With the accepted designations, the algorithm for accounting for the consumption of raw cotton for the *i*-th installation from the *k*-th storage (bunta) will have the form [14].

a) Expense algorithm:

$$\int_O^T Q_{expenditure}(t)dt = \sum_{j=l}^{k}\left[\sum_{i=l}^{l}\left(Q_j^{t_{ij}} - Q_j^{t'_{ij}}\right) + (Q_j^{t_o} - Q_j^{t_k})\right];$$

b) Admission algorithm:

$$\int_O^T Q_{entrance}(t)dt = \sum_{j=l}^{k}\left[\sum_{i=l}^{l}\left(Q_j^{t'_{ij}} - Q_j^{t_{ij}}\right) + (Q_j^{t_k} - Q_j^{t_o})\right];$$

c) Storage algorithm:

$$\int_O^T Q_{keeping}(t)dt = \sum_{j=l}^{k}(Q_j^{t_o} - Q_j^{t_k});$$

where $Q_j^{t_{ij}}$ – is the amount of raw cotton, the *j*-th revolt at the *i*-th moment, closing the air transport outlet valve;

$Q_j^{t'_{ij}}$ – the amount of raw cotton, the *j*-th revolt at the *i*-th moment, closing the air transport inlet valve;

$Q_j^{t_{ij}}$, $Q_j^{t_k}$– the amount of raw cotton in the *j*-th elevator, respectively, at the beginning and end of the accounting period T; $i = 1, 2, \dots, n$; $j = 1, 2, \dots, k$.

The material balance of the company's γ-th installation:

$$\sum_{j=l}^{k}\left[\sum_{i=l}^{l}\left(Q_{jy}^{t_{ij}} - Q_j^{t'_{ij}}\right) + (Q_{jy}^{t_o} - Q_{jy}^{t_k})\right] - \sum_{j=l}^{k}\left[\sum_{i=l}^{l}\left(Q_j^{t'_{ij}} - Q_j^{t_{ij}}\right) + (Q_j^{t_k} - Q_j^{t_o})\right] = P_\gamma$$

where P_γ is the actual loss of raw cotton in the γ- th installation, that is, irretrievable losses, production fumes.

5. Conclusion

The author conducted:

a. analysis of works devoted to automation of calculation of technical and economic indicators of weaving production;
b. analysis of the algorithm for calculating technical and economic indicators of weaving production;
c. analysis of the programming environment that provides simplicity and visualization of calculations related to the calculation of technical and economic indicators of weaving production.

An algorithm for calculating the technical and economic indicators of weaving production has been developed, and an output document form has been developed based on the results of calculating the technical and economic indicators of weaving production [15].

REFERENCES

[1] B. Nosirov and B. Rakhmonova, “Organization of production of walnuts in an industrial volumes,” in *ECLSS Economics and Social Sciences Proceeding Book*, Istanbul, Turkey, 2020, pp. 59–67. [Online]. Available: http://eclss.org/publicationsfordoi/istanbulonline.pdf

[2] U. Sangirova B. Nosirov and B. Rakhmonova, “Properties and potential of walnut growing in Uzbekistan,” *JournalNX - Multidiscip. Peer Rev. J.*, vol. 6, no. 5, pp. 140–146, 2020.

[3] G. M. Ulanov, R. A. Aliev, and V. P. Krivosheev, *Methods of development of integrated automated control systems by industrial enterprises*. Moscow: Energoatomizdat, 1983.

[4] A. A. Kodirov, N. M. Usmonkhyzhaev, B. N. Yekubov, and E. U. Ibragimov, *Automation of production processes of cotton gin and textile enterprises*. Tashkent: TITLI, 2009.

[5] I. S. Ochilov and S. Fayzullaev, "Public-private partnership and marketing issues in the economy of Uzbekistan," *Bus. Expert*, no. 5, pp. 23–29, 2019.

[6] M. K. Pardaev and O. M. Pardaev, "Improvement of organizational and economic mechanisms for the use of innovations in the development of the economy of the Kashkadarya region," in *Modernization of the national economy based on innovative development: problems, solutions and prospects*, 2015, p. 22.

[7] A. T. Mamajonov, "Accounting the Main Costs of Production in Farming and Legal Justification for their Compliance with International Standards," *Am. J. Public Dipl. Int. Stud.*, vol. 2, no. 09, pp. 18–22, 2024.

[8] A. T. Mamajonov, "Theoretical Foundations of Organizing Accounting for the Movement of Materials at Enterprises," *BEST J. Innov. Sci. Res. Dev.*, vol. 3, no. 5, pp. 656–661, 2024.

[9] A. T. Mamajonov, "Improving The Organization of Accounting In Economic Entities Engaged In Export-Import Activities," *Cent. Asian J. Innov. Tour. Manag. Finance*, vol. 5, no. 05, pp. 165–171, 2024.

[10] B. K. Turaev and S. Z. Djalolova, "Features of payment of labor in the service sector," in *Імперативи економічного зростання в контексті реалізації глобальних цілей сталого розвитку*, Київський національний університет технологій та дизайну, 2020.

[11] D. Saodat and H. Hasanov, "Xizmat koʻrsatish sohasida ish haqini tabaqalashtirish va uning xizmat koʻrsatish samaradorligiga taʼsiri," 2016.

[12] M. A. Turgunovich, "Accounting Of Income And Expenses For Regular Activities," *Eur. J. Agric. Rural Educ.*, vol. 2, no. 9, pp. 20–22, 2021.

[13] M. A. Turgunovich X. M. Shodimukhamedovich and K. K. Khasanaovich, "Improving the Organization of Management Analysis in Agriculture," *Int. J. Early Child. Spec. Educ.*, vol. 14, no. 3, 2022.

[14] M. A. Turgunovich, M. Khozhiboev, I. S. Tursunbekovich, and K. H. Khasanovich, "The Procedure for Auditing Financial Results Based on International Financial Reporting Standards," *NeuroQuantology*, vol. 20, no. 11, p. 2073, 2022.

[15] M. A. Turgunovich, "Korxonalarda mahsulot ishlab chiqarish va sotish jarayoni hisobining nazariy asoslari," *Talim Va Rivojlanish Tahlili Onlayn Ilmiy Jurnali*, vol. 3, no. 6, pp. 142–144, 2023.