

The role of the internal audit function in improving the inventory management function: A qualitative study at the cereals and pulses cooperative (CCLS) in the Wilaya of M'sila.

دور وظيفة التدقيق الداخلي في تحسين وظيفة ادارة المخزونات: دراسة نوعية بتعاونية الحبوب والبقول الجافة CCLS بولاية المسيلة.

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Received: 26/09/2025;

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Accepted: 16/10/2025

Abstract:

This study aimed to examine the role of the internal audit function in improving the inventory management function, A field study was conducted at the cereals and pulses cooperative (CCLS) in the wilaya of M'sila, in which we assessed the extent to which internal audit standards (attribute standards and performance standards) contribute to enhancing inventory management

The study concluded that the internal auditing function plays a significant role in improving the management and monitoring of inventories. Both categories of internal auditing standards—attribute standards and performance standards—contributed to enhancing the efficiency of inventory management within the institution.

Keywords: Internal Auditing; Inventory Management; Attribute Standards; Performance Standards.

Jel Classification Codes: M41; M42; L23.

Abstract in Arabic:

هدفت هذه الدراسة إلى معرفة دور وظيفة التدقيق الداخلي في تحسين وظيفة ادارة المخزونات، قمنا من خلالها بإجراء دراسة ميدانية في تعاونية الحبوب والبقول الجافة CCLS بولاية المسيلة، حيث قمنا بمعرفة مدى مساهمة معايير التدقيق الداخلي (معايير الخصائص، معايير الاداء) في تحسين ادارة المخزونات بها.

وقد توصلت الدراسة إلى وجود دور لوظيفة للتدقيق الداخلي في تحسين وظيفة ادارة المخزونات، حيث كان لكل من معايير التدقيق الداخلي (معايير الخصائص، معايير الاداء) دور في تحسين تسيير ومراقبة المخزونات بالمؤسسة محل الدراسة.

الكلمات المفتاحية: تدقيق داخلي؛ ادارة المخزونات؛ معايير الخصائص؛ معايير الأداء.

تصنيف JEL: M41؛ M42؛ L23.

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Introduction

Inventory plays an essential role in most organizations, and it is difficult to find a budget without including inventory as a core element of current assets. This importance is due to the fact that inventory constitutes a significant portion of the total funds invested in a large number of institutions, directly impacting the organization's economics. The cost of holding inventory represents a high percentage that cannot be underestimated. The need to maintain inventory is tied to two types of risks: one related to reducing inventory levels to a minimum threshold, and the other related to increasing it beyond a maximum limit. Furthermore, errors and manipulations in inventory management, if they exceed certain limits, may lead to the collapse of the organization.

To improve inventory management and enhance its efficiency, organizations turn to an effective administrative tool known as internal auditing. Internal auditing is an independent, objective activity performed by internal auditors after preparing and approving an audit program by the Internal Audit Department manager. These auditors examine and evaluate various activities within the organization, and one of their tasks is auditing the inventory, testing its physical existence, and ensuring its proper valuation. This is achieved through both physical and non-physical observation and inquiry lists, which help detect errors, manipulations, and identify potential risks. The process also provides inventory and warehouse management with recommendations to avoid and correct these issues, offering independent, objective assurance regarding the fairness of presenting inventory and the cost of goods sold in the financial statements. This contributes to enhancing inventory management by maintaining it and ensuring that customer demands and the production process are met under economic and rational conditions.

Research problem:

Based on the above, the following research question arises: Is there a role for the internal audit function in improving inventory management at the dry grains and legumes cooperative (CCLS) in the Wilaya of M'sila?

This main problem can be broken down into the following sub-questions:

- Does the role of characteristic standards (traits) contribute to improving inventory management in the economic institution?

- Does the role of performance standards contribute to improving inventory management in the economic institution?

Research hypotheses:

To answer the above questions, we start from the following hypotheses:

- **Main hypothesis:** There is a statistically significant role for the internal audit function in improving inventory management at the dry grains and legumes cooperative (CCLS) in the Wilaya of M'sila.
- **Sub-hypothesis 1:** There is a statistically significant role for characteristic standards (traits) in improving inventory management in the organization under study.
- **Sub-hypothesis 2:** There is a statistically significant role for performance standards in improving inventory management in the organization under study.

Research methodology: Given the nature of the topic and the need to cover its various aspects, address the raised questions, and test the validity of the hypotheses, the research was divided into two sections: a theoretical section that relies on descriptive and analytical methods, and an applied section which also relies on the case study method. In this section, direct interviews were conducted with the professionals involved, specifically the company's internal auditors and accountants. The theoretical framework was applied to this case, in addition to the analytical approach to analyze the results obtained.

1.Theoretical side of the study

1.1 Key concepts on the internal audit function

1.1.1 Concept of the internal audit function:

The internal audit function in the modern business environment has become a major support function for shareholders, management, and external auditors. The extent to which the external auditor relies on the work of the internal auditor depends on the results of the internal auditor's evaluation of the effectiveness of the internal audit activity.

The term "audit" is derived from the Latin word "Audire," which means "to listen," as accounts were read aloud to the auditor. The process of recording and auditing improved after the organization of accounts based on the double-entry method, which was published in the work of the Italian scholar Luca Paciolo in 1494 in Venice.

Internal auditing is defined as an independent evaluation function created within the organization to examine and assess its various activities. The

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purpose of internal auditing is to assist organizational members in effectively fulfilling their responsibilities by providing them with analytical data and information, conducting studies, and offering advice and recommendations regarding the audited activities (Khalaf, 2014, p. 30).

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) defined internal auditing as processes influenced by management within the organization, designed to provide reasonable assurance about the achievement of organizational objectives in the following areas: operational efficiency and effectiveness, reliability of financial reporting, and compliance with applicable laws and regulations (Salhi, 2016, p. 67).

Based on the previous definitions, it can be said that the internal audit function is an independent and objective activity created within the organization, It is broader and more comprehensive than merely financial and accounting audits, extending to a systematic process of examining and evaluating plans, policies, and procedures, proposing suitable ways for their development, assessing employee compliance, and offering advice and recommendations regarding the audited activities, this aims to improve the effectiveness of risk management, control, and governance.

Table number (01): Difference between the old and new concepts of internal auditing

	Détails	Old Concept of Auditing	New Concept of Auditing
1	Services Provided	Examination and Evaluation	Objective assurance and advisory services
2	Objective	Assist individuals in the organization in effectively fulfilling their responsibilities	Add value to the organization and improve its operations
3	Approach to Achieve the Objective	Provide analyses, evaluations, recommendations, advice, and specialized information to examine activities, ensure effective control	Adopt an objective approach to evaluate and enhance the effectiveness of risk management, control, and governance processes

Source: Al-mustansiriya University, college of administration and economics graduate studies, department of accounting, modern internal auditing and financial control according to the requirements of international auditing standards, p. 03.

1.2 Key concepts on inventory

Inventory is considered a crucial element of current assets for most industrial and commercial companies, and to a lesser extent, service institutions, therefore, inventory operations are among the most important tasks performed by an organization.

1.2.1 Definition of inventory:

There are several definitions of inventory, varying according to the perspective and the angle from which it is viewed. Below are some of these definitions:

- The Algerian financial accounting system defines it as "a collection of assets owned by the organization, purchased or created for the purpose of selling, supplying, or consuming in the production, transformation, or exploitation process, generally referred to as inventory and symbolized by the number 3."
- According to Elisabeth Bertin, the Institute of Internal Auditors (IIA) defines: "Internal audit is an independent and objectives activity which gives an organization assurance on the degree of control of its operations, his advices improve them to create added value it helps this organization to achieve this objectives in evaluation by a systematic and methodical approach, its control, risk management, governance processes and by making propositions to strengthen its efficiency" (Souilah & Zahraoui, 2021, p. 1097)
- The American Production and Inventory Control Society (APICS) defines inventory as "the total funds invested in raw materials, parts, work-in-process goods, as well as operating units and final products available for sale" (Blackwood, 2008, p. 10).
- Inventory is considered an asset for the organization and includes the following (Algeria, 2008, p. 12):
 - Inventory held for resale during normal business operations.
 - Inventory in progress for the purpose of sale.
 - Inventory in the form of materials or resources to be consumed in the production process or during service delivery.
- According to "IAS 2" They are the assets that are characterized as being kept for the purpose of sale in commercial activity, and at the production stage they are ready for sale, in the form of materials or supplies used in the production process, or in the provision of services. (Mazal & Hashem, 2024, p. 311)

From these definitions, a comprehensive definition of inventory can be stated as: "Inventory is the collection of finished products, work-in-process products, in-progress items, goods and commodities, raw materials, and supplies purchased by the organization for direct sale, or for modification before resale or use in the production process, including packaging, waste, and scrap."

1.2.2 Inventory auditing

Inventory auditing refers to determining the fairness of presenting raw materials, work-in-progress, finished goods inventory, and the cost of goods sold in the financial statements, it also includes determining inventory auditing procedures, the timing of their performance, sample selection, and testing the elements under examination.

Inventory auditing is crucial for maintaining accurate inventory records. Auditing involves physically counting inventory and reconciling it with recorded data to identify discrepancies. This process helps detect issues such as shrinkage, theft, or administrative errors. Regular audits ensure data accuracy, which is vital for effective inventory management and decision-making. (Majahar Ali, Rabiou, & Ismail, 2025, p. 5) It also guarantees audit of inventory ensures that an organisation do away with those risks which are related to inventory; inaccurate and incomplete inventory records, poor inventory security, unnecessarily high inventory levels, obsolete inventory and inadequate and inappropriate inventory. (Saro, Keitany, & Rop, 2021, p. 88)

In general, the auditing of the inventory cycle can be divided into five distinct parts, which clarify the cycle in which each part is audited, the stages of inventory auditing can be summarized as follows:

- **Purchasing and handling of raw materials and indirect expenses:** Initially, the internal controls on the three functions (purchase orders, receiving raw materials, storing raw materials) are understood, and then they are tested as part of control tests and primary process choices in the purchasing and payments cycle, and the payroll and human resources cycle.
- **Transfer of assets and costs:** This includes the functions of operating and storing finished goods, with these components tested as part of the inventory cycle.

- **Shipping goods and recording revenues and costs:** This includes control tests and primary process tests, as well as procedures to verify accuracy in the main inventory records.
- **Physical observation of inventory:** The auditor's observation of the client's inventory count is crucial to determine if the recorded inventory truly exists as of the financial statement date and if it was counted appropriately.
- **Pricing and accounting procedures:** Inventory pricing refers to the method used to determine the cost of goods when purchased, sold, or used to calculate the cost of goods sold and to determine the remaining inventory value. The primary goal of inventory pricing is to accurately calculate the cost of goods sold to improve the quality of financial statements and profitability analysis, helping to determine profit margins accurately and compare performance across different periods. Several methods are used, including FIFO (First In, First Out), LIFO (Last In, First Out), weighted average, and specific pricing that tracks each unit's cost individually.

The concept of accounting operations in inventory auditing includes the equations used to determine the cost of goods sold and the closing inventory accurately. The basic inventory equation linking opening inventory, purchases, and closing inventory is used to calculate the cost of goods sold.

1.2.3 Importance of inventory auditing:

The importance of inventory auditing and inspection by the internal auditor is due to the significance of inventory itself as one of the most important elements in the balance sheet of any industrial or commercial organization. This importance is emphasized in the following areas (Saraya, 2007, pp. 439-440) :

- Inventory represents one of the most important elements of current assets, especially in institutions engaged in activities requiring multiple inventory components and large quantities, increasing the importance of proper disclosure of these elements in the balance sheet as they attract attention from various stakeholders who use financial reports and statements.
- The cost of goods sold is a crucial element in the income statement because it affects the financial results of the fiscal year, whether profit or loss, due to any increase or decrease caused by inconsistency in applying a specific inventory valuation method at the end of the period.

- The auditing process helps verify the accuracy of the inventory figures presented in financial statements and year-end reports, in terms of accurately counting the quantities of various inventory items, determining inventory prices, valuation methods, and recognizing the inventory counting methods used.

2. Field study at the cereals and dry legumes cooperative in M'sila

To address the research problem and test the associated hypotheses, we conducted a field study at the cereals and dry legumes cooperative in the wilaya of M'sila. We conducted interviews with four experts in accounting and auditing, each with more than ten years of field experience. The interviews were processed using NVIVO software, version 10.

NVIVO is a software tool designed to assist researchers in managing large amounts of qualitative data in an organized manner by coding, linking them to concepts and themes, and conducting in-depth analyses that reveal patterns and relationships. The software allows the use of statistical and descriptive tools, and the creation of visual representations (such as maps and graphs) to facilitate understanding of the results (International, 2020).

2.1 Introduction to the cereals and dry legumes cooperative in M'sila

The cereals and dry legumes cooperative in the wilaya of M'sila (CCLS) is an economic institution established by ministerial decree no. 01342 issued by the ministry of agriculture and rural development on 05/06/1975, its headquarters is located in the industrial activity zone of M'sila.

Although financially independent, the cooperative is supervised by the algerian professional office of cereals (OAIC), which operates under the Ministry of Agriculture, OAIC is the only body in Algeria responsible for overseeing the importation of cereals and distributing them nationwide through local cooperatives at subsidized prices by the state. Nearly every Wilaya has a cooperative that handles the distribution of these products. OAIC is considered the main customer for all cooperatives and is also the direct manager and supervisor.

According to 2024 statistics, the cooperative employs 387 workers across various departments and services within the public economic institution.

2.1.1 Activities of the cereals and dry legumes cooperative in M'sila

The main activity of the cooperative is the storage and sale of various types of cereals, including those for consumption or sowing, such as durum wheat, soft wheat, and barley. The cooperative also sells dry legumes, including beans, lentils, rice, and chickpeas, as well as agricultural chemicals such as fertilizers and herbicides.

Additionally, the cooperative rents agricultural equipment, such as tractors, harvesters, and their accessories, to farmers to enhance their performance in plowing, sowing, harvesting, and threshing activities.

2.1.2 Objectives of the cereals and dry legumes cooperative in M'sila

Like any economic institution, the primary objective of the cooperative is to achieve profit and provide an environment conducive to effective operations, contributing to the achievement of its set goals to ensure the continued sustainability of its activities, the objectives of the cooperative are summarized as follows:

- Provide dry legumes to wholesale traders;
- Regulate the market for cereals and dry legumes by collecting products from local farmers;
- Import cereals and dry legumes to maintain balance in the market;
- Store and ensure the availability of cereals and dry legumes at all times;
- Supply the M'sila animal feed unit with barley year-round at subsidized prices;
- Supply livestock farmers with barley for animal feed;
- Provide mills with soft and hard wheat at subsidized prices;
- Provide agricultural equipment to farmers during the sowing and harvesting seasons;
- Provide seeds, pesticides, and fertilizers to farmers.

2.2 Field study, data processing, and results extraction using NVIVO software

2.2.1 Steps of the Field Study

The first phase involves a preliminary study of the cooperative, focusing on identifying the services provided, the process of inventory movement (in and out), and the procedures followed. This is done to diagnose the situation and relate it to the research problem and hypotheses, thus aligning the theoretical aspect with the applied one.

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The second phase involves processing the data obtained from the interviews using NVIVO software and extracting key insights in the form of numbers and statistics, which are then compiled to draw conclusions.

2.2.2 Steps to use NVIVO Software

To analyze the qualitative data from the interview guide using NVIVO, three steps must be followed:

-Import data: After recording the data from the experts interviewed, it is saved in Word files for each expert. In our study, there are four (04) experts. These files are then imported into NVIVO.

-Code the data: In this step, a set of nodes (study themes) is created and coded. Sub-nodes, representing sub-themes, can also be created. Each expert's responses are linked to the relevant node. In our study, three nodes were created: characteristics standards, performance and implementation standards, and inventory management. Each node is linked to its corresponding hypothesis for testing.

Table number (02): Linking hypotheses with nodes in NVIVO software

Hypothesis	Node
First Hypothesis: There is a statistically significant role for characteristic standards (traits) in improving the inventory management function in the organization under study.	Inventory Management Node
Second Hypothesis: There is a statistically significant role for performance standards in improving the inventory management function in the organization under study.	Inventory Management Node

Source: Prepared by the researcher

-Data analysis and results extraction: In the final step, certain instructions are applied in the software to extract the results of the insights previously mentioned. Then comes the stage of data analysis and interpreting the results obtained in order to test the hypotheses and determine the extent to which they are achieved.

2-2-3 Interview analysis at the cereals and dry legumes cooperative in the wilaya of M'sila : this section will address the experts interviewed, their characteristics, and present the key information and data obtained from the various stages of the case study at the Cereals and Dry Legumes Cooperative in M'sila. This data will be presented and analyzed.

First: Interview climate at the cereals and dry legumes cooperative

The following table will illustrate the climate of the semi-structured interview conducted with the study sample at the Cereals and Dry Legumes Cooperative in M'sila:

Table number (03): Represents the semi-structured interview at the dry grains and pulses cooperative in M'sila (CCLS M'SILA)

Expert	Interview Date, Duration, and Nature of Recording	Conditions of the Interview
Expert 1:Head of Accounting Department, Internal Auditor.	- Interview Date: 28/05/2025 at 09:00 AM.	- Thanking the expert for accepting the interview appointment. - Brief explanation of the research title and the purpose of the interview. - Interaction was generally good, but occasional hesitations in providing information.
	- Location: Held in their office at CCLS.	
	- Duration: 50 minutes.	
	- Note-taking: Manual with audio recording after obtaining expert's permission.	
Expert 2:Responsible for studies, former head of internal audit.	- Interview Date: 28/05/2025 at 10:10 AM.	- Thanking the expert for accepting the interview appointment. - Brief explanation of the research title and the purpose of the interview. - Interaction was generally good, but occasional hesitations in providing information.
	- Location: Held in their office at CCLS.	
	- Duration: 35 minutes.	
	- Note-taking: Manual with audio recording after obtaining expert's permission.	
Expert 3: Head of the statistics department.	- Interview Date: 29/05/2025 at 13:30 PM.	- Thanking the expert for accepting the interview appointment. - Brief explanation of the research title and the purpose of the interview. - Interaction was generally good, but occasional hesitations in providing information.
	- Location: Held in their office at CCLS.	
	- Duration: 30 minutes.	
	- Note-taking: Manual.	
Expert 4: Head of the general accounting department.	- Interview Date: 29/05/2025 at 15:15 PM.	- Thanking the expert for accepting the interview appointment. - Brief explanation of the research title and the purpose of the interview. - Interaction was generally good, but occasional hesitations in providing information.
	- Location: Held in their office at CCLS.	
	- Duration: 40 minutes.	
	- Note-taking: Manual.	

Source: Prepared by the researcher

2.3 Analysis of field study interviews and hypothesis testing

After conducting interviews with the experts mentioned and completing the information recording procedures into files, followed by processing with the

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NVIVO software, the outcomes will be obtained according to qualitative approaches.

- Comparison of expert interviews content in internal auditing

The approaches mentioned earlier will be analyzed to identify the general trends in the experts' responses.

2.3.1 Lexical approach results

After processing the interviews in NVIVO for the experts involved in the field study, the following table was obtained:

Table number (04): Frequency statistics for all interviews

Number	Word	Length (Number of Characters)	Frequency
1	Internal	7	163
2	Audit	7	121
3	Cooperative	9	39
4	Auditor	6	39
5	Responsible	7	38
6	Manager	4	31
7	Administration	7	24
8	Inventories	9	20
9	Resources	7	16
10	Performance	4	14
11	Procedures	9	14
12	Followed	7	14
13	Reports	7	14
14	Planning	7	13
15	For Inventories	9	13

Source: Prepared by the researcher based on the outputs of NVIVO.

The table shows the repetition of vocabulary in all the interviews conducted with the study sample, based on 100 words identified in NVIVO software. From these, 15 key words were selected that are indicative of the subject of our study, according to the sources (4 experts). Several terms were frequently repeated, indicating their importance to the subject of our study at the Cereals and Dry Legumes Cooperative in M’sila.

We observe that the words "Audit" and "Internal" were repeated 163 and 121 times, respectively, indicating that the experts' ideas remained focused on the topic of the study, which is internal auditing, and highlighting its significance to the cooperative. On the other hand, the words "Responsibility," "Manager," and "Management" were repeated 38, 31, and 21 times, respectively. This suggests that there is not much independence for the internal auditor in performing their duties, and that all work instructions and planning are provided by management and the manager.

This can also be inferred by the repetition of words in the word cloud, as shown in the following figure:

Figure number (01): Word cloud for sources



Source: Prepared by the researcher based on the outputs of NVIVO.

Based on the word cloud, which illustrates the most frequently used terms with the sources, we observe that the terms "Internal," "Audit," "Cooperatly," "Performance," and "Resources" are the most frequently repeated and well-understood by the experts. These terms were used extensively throughout the study.

2.3.2 Results of the linguistic approach

This similarity is determined based on the linguistic approach of textual similarity measures, whether between sources or between nodes.

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Table number (05): Represents the similarity of sources based on pearson textual similarity.

Source A	Source B	Pearson Corrélation
Internal Elements\Experts\Study Supervisor	Internal Elements\Experts\Head of Statistics Department	0.970949
Internal Elements\Experts\Head of General Accounting Department	Internal Elements\Experts\Head of Statistics Department	0.96118
Internal Elements\Experts\Study Supervisor	Internal Elements\Experts\Head of General Accounting Department	0.949315
Internal Elements\Experts\Head of Statistics Department	Internal Elements\Experts\Head of Accounting Department, Internal Auditor	0.948295
Internal Elements\Experts\Study Supervisor	Internal Elements\Experts\Head of Accounting Department, Internal Auditor	0.948294
Internal Elements\Experts\Head of General Accounting Department	Internal Elements\Experts\Head of Accounting Department, Internal Auditor	0.93979

Source: Prepared by the researcher based on the outputs of NVIVO

Table number 05 Represents the correlation coefficient based on textual similarity between the sources for the four experts after answering the interview questions. The NVIVO software showed correlation values ranging between (0.970949) and (0.93979), We observe that the percentages are closely related with very minimal differences, indicating a high level of correlation and agreement between the four experts.

3. Testing the study hypotheses

3.1 Testing the first hypothesis: There is a statistically significant role for characteristic standards (traits) in improving the inventory management function in the organization under study.

3.1.1 Results of the thematic approach

The coverage ratio in each specific node represents the number of words from one source concerning that node relative to the total number of words for the same source. Based on the NVIVO software, the coverage ratios for

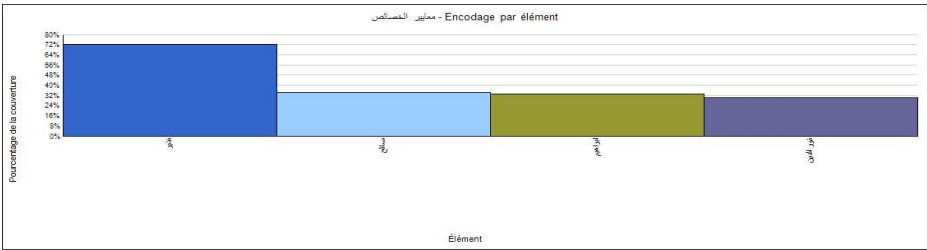
the characteristic standards and their relationship to inventory management were extracted according to each expert.

Table number (06): Represents the coverage ratio for the internal auditing characteristic standards.

Source A	Pearson Correlation Coefficient
Internal Elements\Experts\Head of General Accounting Department (Nadhir)	72%
Internal Elements\Experts\Head of Statistics Department (Saleh)	38%
Internal Elements\Experts\Head of Accounting Department, Internal Auditor (Ibrahim)	34%
Internal Elements\Experts\Study Supervisor (Nour El-Din)	32%

Source: Prepared by the researcher based on the outputs of NVIVO.

Figure number (02): Represents the coverage ratio for the internal auditing characteristic standards



Source: Prepared by the researcher based on the outputs of NVIVO.

From the table related to the thematic approach for the coverage ratios of each expert, we observe that the ratios are between (32%) and (72%), with the average coverage ratio being (44%), this indicates the experts' strong familiarity with the characteristic standards of internal auditing, Moreover, as shown in Figure 2, the head of the general accounting department had the highest coverage ratio, reflecting his deep knowledge and understanding of the internal auditing characteristic standards.

3-1-2 Results of the linguistic approach

In the linguistic approach, the node for characteristic standards and inventory management will be compared to understand the correlation between the two nodes in order to validate the first hypothesis of the study.

Table number (07): Represents the correlation coefficient between characteristic standards and inventory management

Node A	Node B	Correlation Value
Nœuds\chapiters\Characteristic Standards	Nœuds\chapiters\Inventory Management	0.794847

Source: Prepared by the researcher based on the outputs of NVIVO.

From the table above, we observe a significant correlation between the characteristic standards of internal auditing and inventory management, with a correlation coefficient of (0.794847). This demonstrates a strong link between the internal auditing characteristic standards and the process of managing and controlling inventory.

Based on the scoring and evaluation system for hypothesis validation at the University of Montreal, it is evident from the table above that the first hypothesis was achieved with a very good grade (B), indicating that the characteristic standards have a significant impact on the process of managing and controlling inventories.

3.2 Testing the second hypothesis: There is a statistically significant role for performance standards in improving the inventory management function in the organization under study.

Just as the first hypothesis was tested, we will follow the same steps for testing the second hypothesis.

3.2.1 Results of the thematic approach

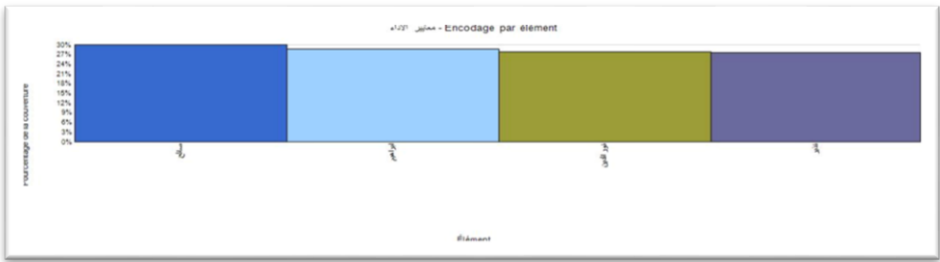
Based on the NVIVO software, the coverage ratios for the performance standards of internal auditing were extracted for the Cereals and Dry Legumes Cooperative in M'sila according to each expert.

Table number (08): Represents the coverage ratio for the performance standards.

Source A	Pearson Correlation Coefficient
Internal Elements\Experts\Head of Statistics Department (Saleh)	30%
Internal Elements\Experts\Head of Accounting Department, Internal Auditor (Ibrahim)	27.83%
Internal Elements\Experts\Study Supervisor (Nour El-Din)	27.20%
Internal Elements\Experts\Head of General Accounting Department	26.85%

Source: Prepared by the researcher based on the outputs of NVIVO.

Figure number (03): Represents the coverage for the performance standards node



Source: Prepared by the researcher based on the outputs of NVIVO.

From the table related to the thematic approach for the coverage ratios of each expert, we observe that the ratios range between (26.85%) and (30%), with an average coverage ratio of (27.97%). This indicates the experts' strong familiarity with the performance standards of internal auditing. Moreover, as shown in Figure 3, the percentages are closely aligned, which indicates that all four experts are specialists with over 10 years of practical experience in accounting, auditing, and finance.

3.2.2 Results of the linguistic approach

In the linguistic approach, the node for performance standards and inventory management will be compared to understand the correlation between the two nodes in order to validate the second hypothesis of the study.

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Table number (09): Represents the correlation coefficient between performance standards for internal auditing and inventory management.

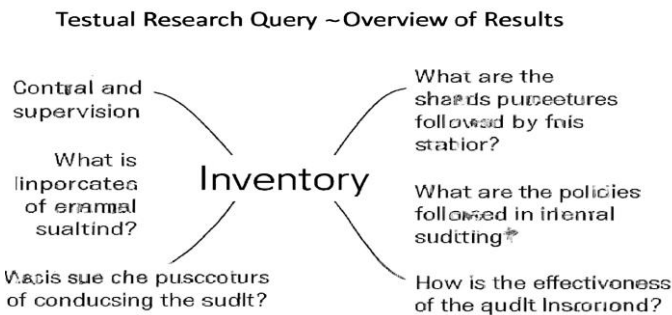
Node A	Node B	Correlation Value
Nœuds\chapters\Performance Standards	Nœuds\chapters\Inventory Management	0.79825

Source: Prepared by the researcher based on the outputs of NVIVO.

From the table above, we observe that the correlation between the node for performance standards and inventory management is (0.79825), the correlation coefficient is very high, indicating that as the performance standards for internal auditing, as outlined by international internal auditing standards, are applied, inventory management become more effective, this means that the second hypothesis was achieved with a grade of "Very Good" (B), demonstrating that the implementation of performance standards in internal auditing has a significant and marked impact on the process of managing and controlling inventories, forming a strong and flawless control system.

3.3 Cognitive map for the node of inventory management

Figure number (04): Represents a Cognitive Map for the Node of Inventory Management



Source: Prepared by the researcher based on the outputs of NVIVO.

3.4 Analysis of results

Based on the results obtained using the NVIVO software, and by extracting the approaches as well as referring to the guide for determining

the degree of validation of each hypothesis, we arrived at the hypothesis testing results as shown in the following table:

Table number (10): Represents the degree of validation for each hypothesis.

Hypothesis	Dégré of validation
First Hypothesis: There is a statistically significant role for the characteristics (traits) criteria in improving the inventory management function in the organization under study.	Very Good
Second Hypothesis: There is a statistically significant role for performance standards in improving the inventory management function in the organization under study.	Very Good

Source: Prepared by the researcher.

The table above represents the degree of validation of the study's hypotheses based on an evaluation model from the University of Montreal, Canada, using the NVIVO qualitative analysis software.

- According to the first hypothesis, which stated that there is a statistically significant role for the characteristics criteria of the internal audit function in improving the inventory management function in the Dry Grains and Legumes Cooperative in M'sila, it was found that the more the characteristics criteria are met, both in terms of the internal auditor's qualifications (scientific and personal) and the organization providing independence and formalization for internal auditing, the more effective the inventory management process is. This enables the organization to safeguard its assets and properties.
- The second hypothesis, which stated that there is a role for the performance standards of the internal audit function in improving inventory management, revealed a very strong correlation. The more performance standards are applied within the organization, such as monitoring product quality, customer satisfaction, or execution accuracy, the more effective the inventory management process is, thus achieving the organization's goals.

Conclusion:

Internal auditing is a pivotal tool in enhancing the efficiency and effectiveness of inventory management within economic institutions, it does

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not merely involve checking compliance with accounting and regulatory standards but also extends to evaluating internal systems and procedures to identify strengths and weaknesses, internal audit offers practical recommendations to improve performance, by applying the characteristics and performance standards, internal auditing contributes to transparency, risk mitigation, and the optimal use of available resources to serve the organization's goals.

In our research, we attempted to answer the main question: What is the role of the internal audit function in improving inventory management within the economic institution, we conducted a field study at the CCLS cooperative of dry grains and legumes in M'sila.

Two hypotheses were tested related to the internal audit function's standards (characteristics or traits and performance standards) in improving inventory management within the organization under study, the results showed that both hypotheses were validated, confirming that the internal audit function plays a role in enhancing inventory management. It was found that when characteristics criteria are met, both in terms of the internal auditor's qualifications and the organization's provision of independence and formality for internal auditing, along with performance standards such as monitoring execution accuracy, work compliance, and customer satisfaction, the inventory management process improves, this was evident in the experts' responses during the study, despite other internal audit standards, such as defining objectives, authority, and responsibilities, not being addressed in our study.

Our study also concluded that the organization's reliance on the internal audit function allows it to build a sustainable monitoring system that strengthens trust among various stakeholders, both internal (management and employees) and external (partners and regulatory bodies). Therefore, improving inventory management through internal auditing is a key pillar for enhancing operational efficiency, ensuring financial accuracy, and boosting the organization's competitiveness in a work environment characterized by increasing challenges and risks.

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