

E-Learning Management Model to Improve the Productivity of the Induction and Training Process Through 5S, Work Breakdown Structure and Scrum in a Service Company

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Abstract

This study analyzes the case of an auditing company that presents low productivity and profitability. As an improvement initiative an e-learning management model is implemented using engineering tools such as the 5S, SCRUM methodology, Work Breakdown Structure (WBS) and the development of a dashboard for monitoring. In the last quarter of 2023, deficiencies were evidenced in the fulfillment of key indicators such as: The company's gross monthly profit is \$ 110 021, which is low considering the company's capacity. Only 55% of the auditors complied with the 32 hours of continuous training required by the Association of Professional Social Compliance Auditors (APSCA), only 60% achieved the minimum quality standards in audit reports. Also, the low productivity of the auditors was 0.059 audits/H-H. A quantitative methodology with a quasi-experimental design was applied, comparing performance before and after implementing the model in 2024. The results showed significant improvements: a 79.10% growth in profit margin, which is reflected in the increase in productivity of 6.78%. In addition, full compliance with the APSCA indicator and the quality indicator increased. In conclusion, the implementation of the new e-learning model based on engineering tools effectively contributed to the annual performance and relinquished ability of the company.

Keywords

5S, Productivity, Scrum, E-Learning, Engineering Tools, Human Capital.

1. Introduction

Organizations face new and complex challenges in the face of globalization, technology innovation and competitiveness. Faced with these dilemmas, human talent management is considered as a main factor in organizations that allows improving productivity and efficiency levels. Therefore, the importance of human talent management models at the corporate management level is highlighted (Canales Gonzales, 2024). Human talent management has been consolidated as a fundamental strategy to achieve organizational success, through the implementation of the following elements such as selection, learning and development; and recognition and reward within the organization; adapted to the capabilities of corporate and operational personnel (Velázquez-Castro & Cruz-Coria, 2021). Companies are aware of the importance of labor performance, and it should be considered as a critical element in the strategic management process. Human capital acquires special relevance in SME companies, which usually have limited resources. Therefore, they seek to maximize the performance of their staff. In this context, workers are a strategic

resource, which makes it essential to implement adequate human talent management processes (Pocztowski & Pauli, 2023). Likewise, it is necessary to know and measure the performance of employees with respect to their work, in order to recognize those who add value to internal processes (Tejada Correa, 2021).

The analysis and metrics in personnel management are used fundamentally for proper decision making and orientation of management strategies within the company (Ekka, 2021); therefore, the use of management indicators allows quantitative measurement of the performance or operation of the processes in the organization and allows the identification of the shortcomings that it presents. Ghiglione (2021) emphasizes that "establishing management indicators correctly and objectively is the key to the success or failure of the implementation of the performance evaluation and continuous improvement system". There must be a strategic alignment in the institution according to its priorities, establishing indicators that guarantee alignment with the vision and mission and, if required, rethink the initial strategies to ensure the correct direction of the company towards the expected results (Torres-Salgado, 2021). Cao et al. (2024) mention that companies are responsible for respecting the welfare of their workers, as well as their rights. Therefore, adequate working conditions must be ensured so that good results are obtained in all the different areas of the company involved in the service or product offered. Vinšalek, (2022) argues that through audits, which involve an official review of the procedures and codes of conduct of any company in different lines of business such as mining, food, health, production, environmental, services, etc., have a development and the scope of their results are sustainable.

This article takes as its object of study a company that offers auditing services, which obtained unsatisfactory results during the last quarter of 2023 with respect to the evaluation of its 40 auditors, this sample was non-probabilistic and based on convenience, as the auditors with the most certifications were selected in order to cover the different audit service schemes. The prices of these services depend on different factors, such as: location, duration, type of certification, the average price per audited day is 735 USD, this information was provided by the Head of Commercial and Business Development. An important aspect that was analyzed was the revenue for the last quarter of 2023, which amounted to 789 930 USD. This amount is well below the annual projection, considering the number of auditors available and the diversity of certifications that the auditing firm provides. This is due to the low performance productivity of the auditors (0.059 audits/H-H). Regarding the expenses that were considered for the study, there is the payment to the auditors that depends on the authorizations and expertise that the auditor has, the average payment per day worked (8 hours) is 325 USD. Travel expenses for the audit are covered by the client, so they are not considered. Another aspect analyzed was the requirement of the Association of Professional Social Compliance Auditors [APSCA], which requires its auditors to complete 32 hours of continuous professional training each year; however, only 22 auditors completed the 32 hours of training according to the annual plan for each auditor, which means that only 55% of its auditors comply with the "APSCA" indicator. This gap has caused a breach in the continuity of the audit process, which is reflected in lost profits for the company due to the cancellation of the service or higher costs of hiring a qualified external auditor for the assignment. Finally, the "Quality Review" indicator was analyzed, which allows evaluating the degree of compliance with the parameters established by the different certifications within the company, which is validated in the audit report; the results during the period analyzed showed that only 10 auditors (25%), are "outstanding"; 14 auditors (35%) "Meet the requirements"; 9 auditors (22.5%) "Need reinforcement" and 7 auditors (17.5%) were not evaluated; an aspect that affects the supervision, monitoring and control of the audit team.

The traditional model of the induction and training process used by the company under study lacks monitoring and control, causing the audit team not to reach the maximum level of efficiency in the performance of their functions to achieve the objectives of the organization. In this sense, the following research question is formulated: Is it possible to increase the level of productivity and annual profitability of the organization through the implementation of an E-learning management model applying engineering tools in the induction and training process of auditors?

1.1 Objectives

The objective of this study is to develop a new e-learning management model implementing engineering tools in order to increase the performance of the auditors, making the organization more competitive and increasing its annual profitability.

The specific objectives are as follows:

- Implement a new e-learning management model using engineering tools such as 5's methodology, Work Breakdown Structure, Scrum and the development of a dashboard for the control and monitoring of auditor competencies through the analysis of the indicators defined in this work.

- Analyze the indicators of the fourth quarter of the year 2023 to determine the origin of the low performance of the induction and training process of auditors through the use of the problem tree.
- Evaluate the effectiveness of the new e-learning model compared to the traditional model for the last quarter of the years 2023 and 2024, by analyzing the performance metrics established in this study, with the support of a dashboard to visualize the results.

2. Literature Review

Talent management methods are comprised of training, development, engagement and retention of talent. Essentially human resource development has been the main driver of improvement activities oriented on personnel such as learning and professional growth (Dalal & Akdere, 2021). Rodrigues et al (2020) explains that agile tools can be implemented in short periods of time, which encourages staff to foster solid work habits and constant discipline.

In addition, they mention that this implementation increases the motivation of those involved and the involvement of the areas to achieve common objectives (p. 14). For Gaete et al. (2021) "The modern definition of agile development points out that requirements and solutions evolve over time according to the needs of the project and where the collaboration of work teams is essential for the fulfillment of objectives".

Likewise, Beltrán et al. (2023) explain how the implementation of a management based on Lean principles has positive impacts on efficiency and quality. Trejo (2024) points out that Learning Management System (LMS) platforms are an excellent option for online job training (e-learning) in organizations, constituting an effective investment for the development of skills and knowledge of the staff, since they satisfy current training needs by offering a personalized learning experience, easy access from any location and device, and constant monitoring and evaluation to measure the progress of the training.

Organizations now demand professionals capable of verifying ethical, environmental, and social compliance, especially in sectors where reputation and sustainability are critical (Selvakumar, 2025). However, the supply of qualified social auditors remains limited, as the role requires multidisciplinary expertise and there are few specialized training programs available (Rumasukun, 2023). This shortage leads to delays, higher auditing costs, and superficial assessments that undermine credibility (Abrahams & Phesa, 2025).

The 5S Methodology

The 5S methodology is used in companies of different industries and in all related areas to improve work dynamics based on five principles; Selection (seiri), order (seiton), cleanliness (seiso), standardization (seiketsu) and discipline (shitsuke). Del Carmen Hernández-Crisostomo et al., (2023) explain that warehousing within the supply chain has the responsibility to control and manage an organization's inventories. The inventory system is based on techniques and procedures used to supervise and organize the materials used in the company, so it is essential to have them on time and immediately available.

Work Breakdown Structure (WBS)

This tool plays a crucial role in a project by breaking down the hierarchy of the total scope of work in a way that minimizes previous work. An improperly crafted WBS can lead to repetitive work, scope variation, cost overruns, delays in estimated delivery time, and additional deliverables or features that are not needed in the project (Ikarwitaza et al., 2021). According to Rivanda et al. (2021) to keep the activity components aligned with the project objectives, the work breakdown structure should be developed from top to bottom.

The SCRUM Methodology

This technique is well suited for managing complex projects that require rapid results in the face of changing environments. SCRUM is based on the process of developing a project through iteration cycles called sprints and employs key roles such as "the Product Owner," who represents stakeholders such as the customer and continuously participates in the development process by facilitating the understanding of the customer's requirements. The second key role is "the facilitator" [Scrum master], who is in charge of guiding the team in the implementation of the correct practices, simultaneously, his responsibility is to eliminate and diminish the tensions within the development team.

On the other hand, "the Scrum team" [ScrumTeam] is in charge of developing the application (Castellanos et al., 2024).

The implementation of a dashboard facilitates visibility regarding the indicators established by the organization that must reach their maximum value in order to meet the objectives of the company; and at the same time allows to analyze the data, trends and obtain a constant monitoring of these indicators. . In the research of Samad and Setyabudhi (2023) the relevance of using the control panel on a single screen that allows visualization of the performance of its indicators improving management performance is explained.

3. Methods

The study is empirical and quantitative in nature, based on a post-positivist paradigm, and was developed in an international social compliance audit firm based in Lima, Peru.

3.1. Proposed improvement model

The phases and stages of the implementation of the e-learning model in the organization are detailed below. See Figure 1.

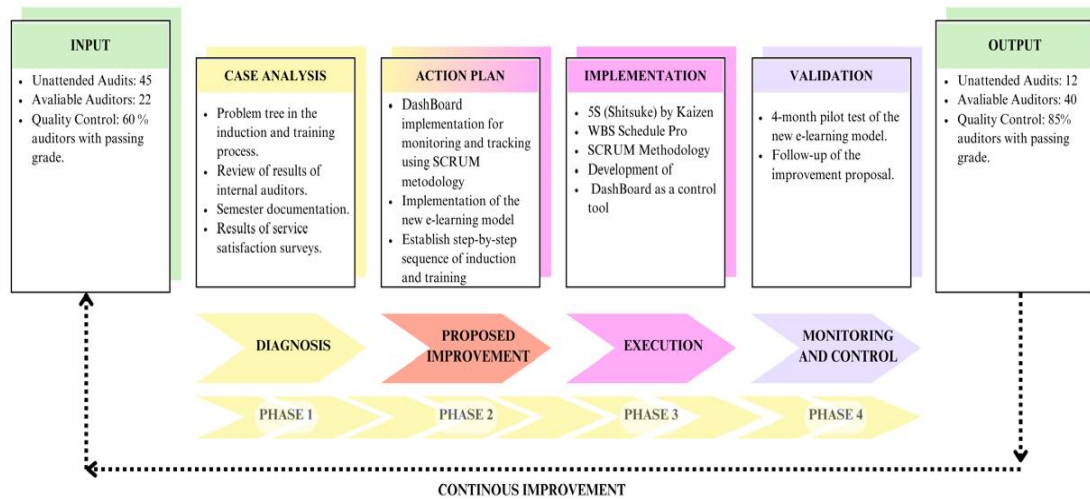


Figure 1. Proposed improvement model for the consulting firm.

Phase 1, diagnosis: The Human Resources department provided data on the auditors’ productivity. We evaluated compliance with the APSCA requirement of 32 hours of training and verified this information using official APSCA records. In addition, we reviewed the Quality Control (QC) process, which is responsible for reviewing audit reports, to analyze the results of the Quality Review indicator. We also considered the volume of audits performed by each auditor to ensure data accuracy and analyzed the losses resulting from unattended audits. This information enabled us to develop a problem tree for an accurate diagnosis (see Figure 2).

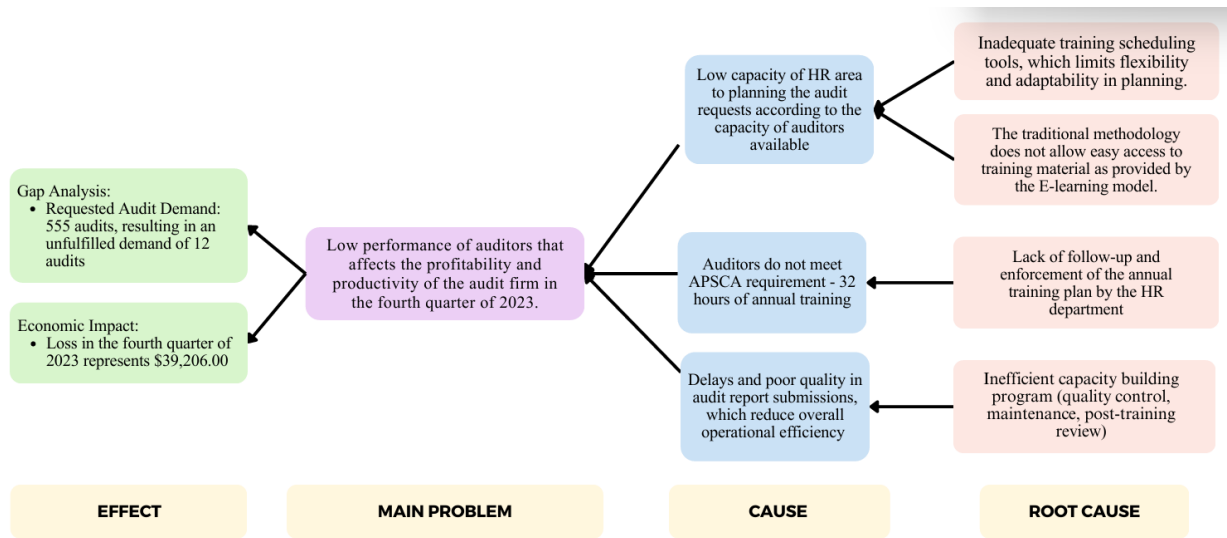


Figure 2. Root Causes and Consequences of Low Productivity

Phase 2, improvement proposal: The improvement proposal for the company was elaborated through the implementation of engineering tools, such as 5S, Work Breakdown Structure (WBS) and Scrum Methodology to improve the indicators previously analyzed and the elaboration of a dashboard for the automation in the monitoring and control of these indicators.

Phase 3, execution: The 5's methodology was considered to classify, order, clean, standardize and conserve the Induction and Training material for the auditors. Also, a control and follow-up schedule was implemented to ensure that the processes comply with the established time by using WBS Schedule pro and the implementation of SCRUM methodology to face this new challenge and organize ourselves correctly among the related areas to achieve the established objective "To implement a new E-learning management model applying engineering tools in the induction and training process for auditors". See Figures 3, 4, 5 and 6.

The implementation of WBS Schedule Pro began with a detailed breakdown of all internal processes and areas involved in developing the new e-learning model. In this first phase, key processes were identified and their relationships determined, grouping them according to operational needs and each area's responsibility. Subsequently, a structured schedule was created, outlining the activities and dates for each process to track and control deadlines. Simultaneously, the materials, resources, and costs required for each activity were assessed, ensuring accurate and comprehensive planning. Tasks and responsibilities were assigned to the leaders of each area, guaranteeing proper coordination and distribution of workload. Finally, progress was continuously monitored and updated in the software (Figure 3).

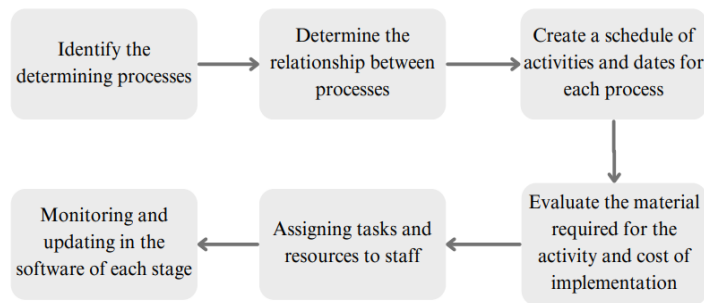


Figure 3. Application Flow 1: WBS Schedule Pro

For the implementation of Scrum, a Product Backlog was created to determine the project's most relevant features and needs. Brainstorming sessions were conducted to establish User Stories and define Scrum roles: the Product Owner (Head of HR), the Scrum Master (Business Executive), and the Development Team (IT). Acceptance criteria were then established to ensure auditors had access to online materials, completed training courses, and provided feedback. The Product Owner prioritizes the most relevant features. User Stories are reviewed and refined for clarity during Backlog preparation. Finally, the IT team organizes and executes each sprint, testing the solution and identifying areas for improvement (Figure 4).

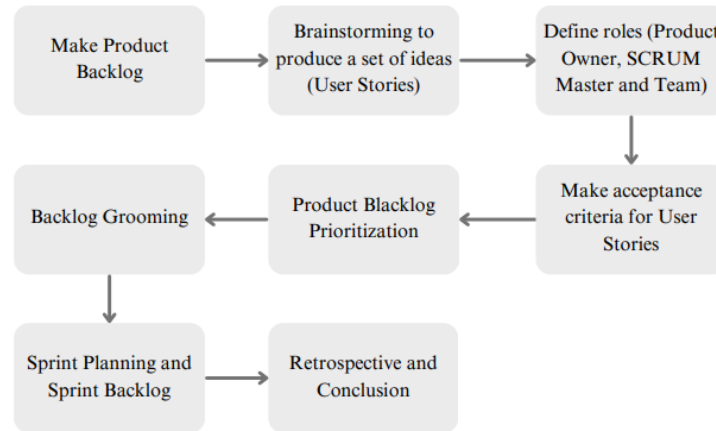


Figure 4. Implementation Workflow 2: SCRUM Framework

The 5S methodology was implemented, focused on the management and organization of training materials of the new e-Learning model. In the first stage, Seiri (Classify), the materials were organized according to the authorship scheme, then Seiton (Sort) was used, facilitating location and access to reduce search time. The third stage, Seiso (Eliminate), is where obsolete materials or materials with outdated information are eliminated, ensuring that the content is aligned with current standards. In the fourth step, standardize (Seiketsu), the e-learning materials were standardized to ensure uniformity in formats and structure. Finally, Shitsuke (Maintain) is carried out, the adaptation of the materials to the new e-learning model is verified, reinforcing organizational discipline and continuous improvement (Figure 5).

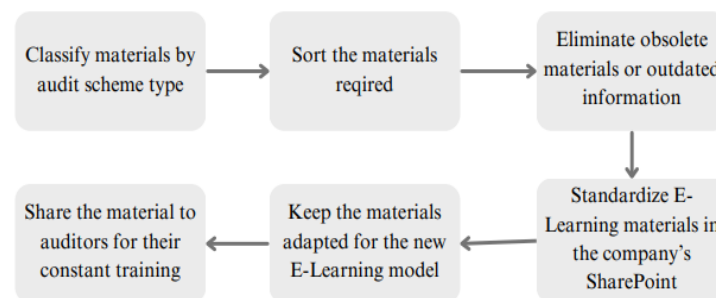


Figure 5. Implementation Workflow 3: 5S Approach

The Dashboard implementation process begins with identifying the monitoring modules, which include auditors, their certifications, training hours, languages, country-specific permits, and work schedules. Once these elements are defined, the information is organized to ensure greater control over its management and to identify any shortcomings. Afterwards, certification requirements are established according to job position, such as lead auditor or team auditor. With this information, a request is submitted to the IT department to initiate the Development Request. The IT team is responsible for developing the programming and designing the database necessary to run the solution in JavaScript, the language used on the company's intranet. Finally, with the database and design implemented, it is possible to

generate various key performance indicators (KPIs), such as training hours, hours completed, hours worked, certification validity, and auditor utilization rate. These indicators allow the evaluation of compliance with the established requirements and the efficient use of available man-hours.

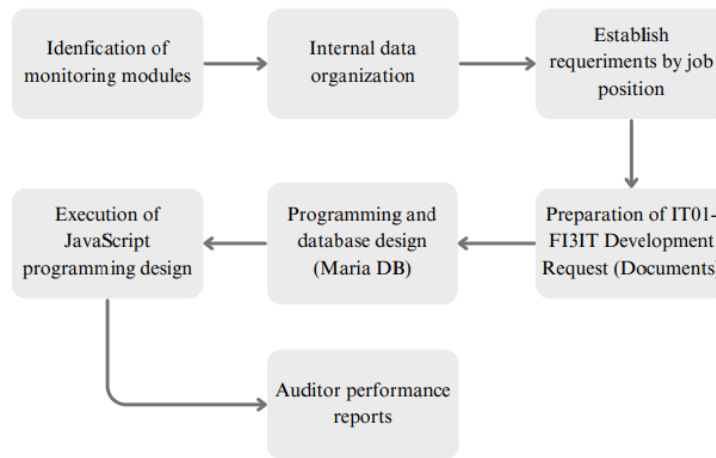


Figure 6. Implementation Workflow 4: Performance Dashboard

Phase 4, monitoring and control: In March 2024, the pilot test of the new e-learning model began with the aim of exceeding and proving better performance for the last quarter of 2024 in comparison of the last quarter of 2023, when the traditional model was used. Furthermore, the implementation of the new e-learning model is continuously monitored during the auditor induction and training process.

4. Data Collection

As explained in phase 1 of the diagnosis, specific data provided by the human resources manager of the company were used to develop the Problem Tree, allowing us to identify the factors that cause the low performance in the induction and training process of the organization studied, which is reflected in the indicators mentioned above. In addition, the volume of audits in the different regions was shared with us, focusing on the evaluation of 40 auditors. We were also provided with the profiles of the auditors, including their respective training hours.

It is important to highlight that the shared information complies with data protection and privacy measures. Individual auditors are not identified, as only combined and average information from the auditors are presented, and no individual data or confidential company information is disclosed.

5. Results and Discussion

5.1 Numerical Results

A comparison was made between the last quarters of 2023 and 2024. The results obtained are shown below. Table 1 shows a comparison of the metrics of the new e-learning model for the periods analyzed.

Table 1. Comparison between the fourth quarters of the year 2023 and 2024

KPI	Traditional Model	Improved Model Proposal
Unattended Audits	8.11%	1.36%
Average Audits Completed	128	217
Average of Productivity	0.059	0.063

Audits not attended: During the periods analyzed, a 73.33% decrease in the average number of cancelled audits was observed, going from 45 audits not attended in 2023 to only 9 in 2024. This reduction occurred despite an increase of

70.39% in the total number of audits performed in 2024, which translates into 326 additional audits compared to the period in 2023. See Table 2 and Table 3.

Total Audits=Performed Audits + Cancelled Audits + Only Quoted Audits

$$\text{Unattended Audits (\%)} = \frac{(\text{Cancelled Audits} + \text{Only Quoted Audits})}{\text{Total Audits}}$$

Table 2. Total number of audits year 2023

AUDITS 2023	Performed Audits	Cancelled Audits	Only Quoted Audits
September	117	5	8
October	104	1	9
November	150	11	3
December	139	4	4

Table 3. Total number of audits year 2024

AUDITS 2024	Performed Audits	Cancelled Audits	Only Quoted Audits
September	211	0	1
October	207	1	0
November	245	6	1
December	206	2	1

Average number of audits performed: As shown in the table, data was collected for the closing of the fourth quarter of the year 2023 and 2024 on audits attended. It should be noted that the audits performed cover the entire process, including the execution of the audit, the preparation of the report and the identification of nonconformities that are reflected in the audit report.

Auditor coverage: The company's platform restricts all audit coordinators from assigning the same auditor to the field for more than 5 consecutive working days, which is equivalent to 40-man hours per week. Consequently, they cannot be assigned to more than 14 man-days per month. This indicator shows how many audits were handled per man-hour worked. This KPI was calculated using the following formula:

$$\text{HH Coverage (\%)} = \frac{\text{HH Used}}{\text{Maximum HH}} * 100$$

In addition, the implementation of the Dashboard in the HR area and the automation in the follow-up favors the continuous improvement of personnel performance, allowing access to information in a more efficient way for future performance evaluations. In their research, Caciano et al. [24] explained that they managed to improve talent management performance by implementing a Web System applying the scrum methodology, consolidating an agile and easily adaptable structure that facilitated process optimization, decision-making, incentive innovation, and the organization's competitiveness.

From a financial perspective, considering that the standard price of an audit is valued at 735 USD/day, this data was provided by the head of the Commercial and Business Development area of the company, as can be seen in Table 4. In addition, the HR manager provided us that the average daily payment of auditors (8HH) is 325 USD, this amount varies slightly considering the expertise and certification requested.

Table 4. Average monthly profit for the year 2023 and 2024

KPI	Traditional Model	Improved Model Proposal
Average Monthly Revenue	197 232	317 611
Auditor Payments	87 211	140 440

In the study period an approximate profit of 708 685 USD was achieved, which represents a significant increase compared to the same period of the previous year 2023, which was 440 083 USD, meaning that the increase was 61.02% with respect to the year 2023.

5.2 Graphical Results

For the period 2023, an analysis was performed of the number of audits attended and not attended per month, shown in Figure 7.

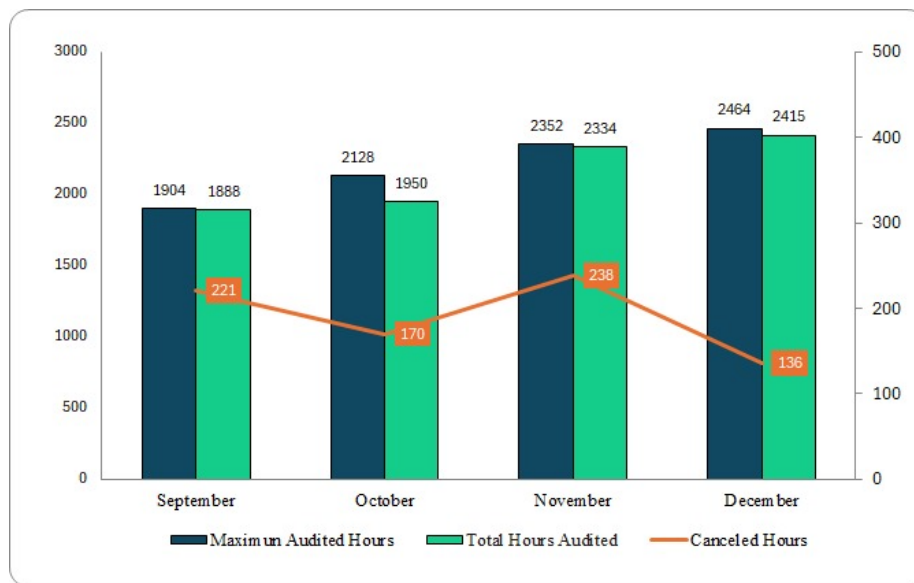


Figure 7. Overview of the capacity in the period 2023

From the graph the established man-days of work are met. The fourth quarter was selected in the different years evaluated due to seasonal fluctuations in demand. In November and December there is usually an increase in the number of auditors due to the closing of the fiscal year for compliance with regulations and annual reports. Currently, we have more auditors to meet market demand. On the other hand, client requirements may vary depending on regulatory demands and the sensitivity of the information handled during audits. For this reason, only the requirements established by the various certification schemes are considered. Within this context, clients must comply with social and environmental audits to ensure that their operations and products adhere to principles of ethics, sustainability, and fair labor practices. These audits make it possible to verify legal compliance, promote appropriate working conditions, safeguard the environment, and demonstrate that the organization is committed to ethical and transparent practices (Akinsola, 2025). The implementation of the new e-learning model in the company demonstrates an improvement regarding the availability of auditors to supply the demand for audits in each month of the year 2023 as shown in Figure 8.

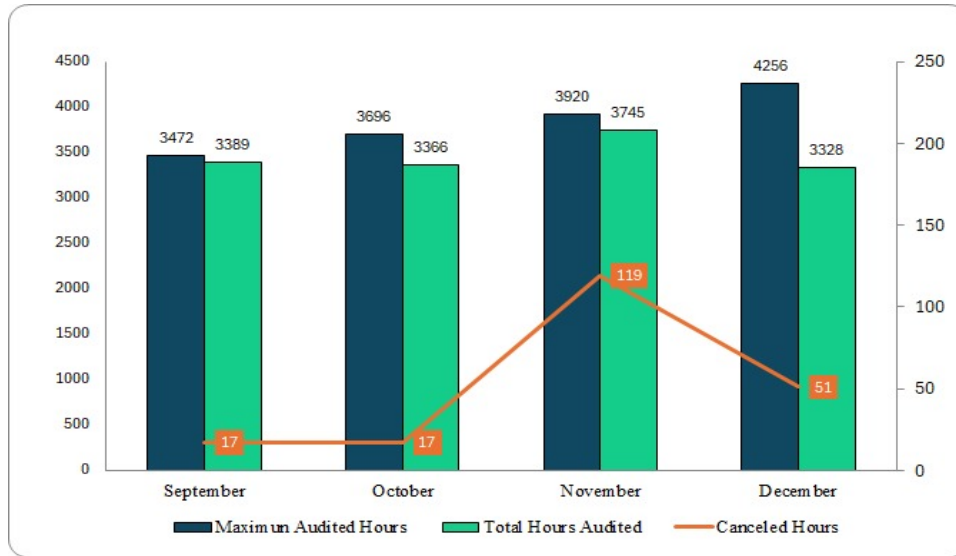


Figure 8. Overview of the capacity in the period 2024

5.3 Proposed Improvements

Table 5 shows the results of the pilot test of the new e-learning model in the fourth quarter of 2024 compared to the results of the fourth quarter of 2023.

Table 5. Comparison of fourth quarter performance indicators for the year 2023 and 2024

KPI	Traditional Model	Improved Model Proposal	Increase
Gross Profit	108 445	194 238	79.1 %
APSCA Compliance	22	40	81.8%
Quality Control	60%	85%	41.7%

Initially, it was observed that only 22 auditors in the organization met the requirement of 32 hours of continuing education; however, after the improvement, all 40 auditors now meet this requirement, representing an 81.82% increase compared to the analyzed period in 2023. This change ensures that all auditors are up to date in their training, in full compliance with APSCA standards.

In the traditional model, compliance with quality standards was 60%. With the improvements implemented, this indicator rose to 85%, which represents an increase of 41.67% compared to the period analyzed of 2023. This progress demonstrates a substantial increase in quality and compliance with the parameters established in each scheme.

5.4 Validation

The pilot test was carried out in March 2024, and the fourth quarter of 2023 was taken as a comparative sample for validation. Likewise, a sample of 40 auditors were considered for both periods, who contributed to the analysis. The following data were obtained after the implementation of the proposed improvement: the cancelled audits for the year 2023 represent an economic loss in the company with a value of 39 206 USD. For 2024, after the implementation of the new e-learning model, the economic loss was 10 455 USD, considering that the demand for audits increased by 42.46% as explained in point 5.1.

Currently, the company has a capacity of 40 auditors to cover the existing demand in the market, which means that the company has a better position in the face of the competition and the auditors, being trained, guarantee a high-quality service.

6. Conclusion

Through this research it is concluded:

- The e-learning management model implemented optimized the process of induction and training of auditors through tools such as the 5's methodology and SCRUM, Work Breakdown Structure, achieving an increase in audit capacity from 91.8% to 98.7% in the periods analyzed.
- With the implementation of the new e-learning model in comparison with the traditional model for the fourth quarter of the years 2023 and 2024, 100% compliance was obtained with respect to the APSCA indicator (40 auditors trained) and a 41.67% increase in the Quality Review indicator, which means that 34 auditors comply with the parameters.
- The company's gross profit increased significantly during the period analyzed. In 2023, 110 021 USD were obtained and in 2024, 177 171 USD, representing an increase of 61.02% due to the increase in audits attended and cost reduction.

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*Proceedings of the 3rd GCC International Conference on Industrial Engineering and Operations Management
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