Computer Fraud and Security
ISSN (online): 1873-7056

Optimization Path of Enterprise Financial Internal Control and Audit in ERP System Environment

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Abstract

In order to be competitive and keep up with technological changes, businesses are using new technologies. Among these technologies is the Enterprise Resource Planning (ERP) System. A complex software database integrates all the company's divisions, including marketing, finance, manufacturing, and human resources, to control and arrange activities. Inaccurate financial reporting and transactions are more likely when enterprise resource planning (ERP) is not adequately controlled internally. Business executives claim that good internal controls for enterprise resource planning improve the quality of financial reporting and reduce the risk of fraud. The main purpose of this article is to give a brief summary of the relevant ERP environment content and to illustrate the need of creating internal control for the financial accounting information system. To look into the strategies for enhancing the financial accounting information system's internal control within the ERP environment, the author examines how the ERP environment affects this system's internal control. Using an accuracy of 98.7% and an AUC-ROC curve of 0.95, this paper proposed Artificial Algae Optimization based on Multi-Linear Random Forest regression (AAO-MLRFR) Algorithm to conduct a comprehensive analysis to clarify the importance of internal control in the financial accounting data information system. All of the features of the ERP system are within the reach, , raise the standard of financial accounting information management, and encourage the company's long-term growth.

Keywords: Enterprise Financial Information, Internal control, Audit, ERP system Environment, Software, AAO-MLRFR.

I. Introduction

Enterprise Resource Planning, or ERP, is a type of enterprise resource planning that was created because of the trend toward accounting informationization. Procurement, production, costs, inventory, distribution, transportation, finance, and human resources planning can all be managed and controlled with the help of enterprise resource integration, which is based on computer technology and allows for the automatic transfer of accounting data and information between modules. The objective is to maximize the advantages and efficiency of management while optimizing the configuration of resources. In addition to a suite of software applications, enterprise resource planning (ERP) is a kind of complex management concept [1].

As knowledge, technology, and social and economic wealth increase, so does commercial competitiveness in the market. Many businesses have used ERP, an advanced information management system, to control their real output. In order to produce the best economic management system that incorporates the most cutting-edge enterprise management theory in the world, ERP systems are built on information technology and are based on a systematic management thinking [2].Management are optimized and achieve overall balance through company logistics, capital flow, and information flow.

Enterprises' fundamental competitiveness is enhanced by their coordination of administrative departments and concentration on market-oriented business operations. Additionally, enterprise information serves as a crucial

basis for decision-making. Consequently, make the most of the internal resources available in the ERP environment [3].

Internal Audit: Companies now see risk management and internal controls as essential to their business operations due to the increasing complexity of operating in a global environment, technological advancements, and a faster pace of business, as well as increased regulations and stricter accountability for accurate financial reporting. As a result, many internal audit functions have expanded their risk and control duties to include evaluating the efficiency of operational and financial controls as well as ensuring legal and regulatory compliance [4].

The United States was the birthplace of internal control, which flourished throughout the industrialized capitalist nations of the west. Nevertheless, internal control issues have been the source of several business scandals in industrialized nations, including numerous huge multinational corporations [5]. China continues to differ greatly from the capitalist nations in terms of its economy, culture, society, government, company management, and other areas, which will result in dangers that are distinct from those faced by international businesses. Analyzing and researching domestic company internal control instances is particularly important for the implementation and advancement of internal control in Chinese firms [6].

ERP systems consist of a collection of software modules that are connected to a shared database. These modules are capable of managing fundamental business operations, including sales, distribution, manufacturing, finance, human resources, and material management [7].In order to balance supply and demand, ERP systems concentrate on integrating all internal corporate transaction processes. Businesses may save expenses and inventories while increasing customer service and efficiency through cross-functional integration. ERP solutions therefore have the potential to provide businesses a stronger competitive edge [8].

ERP applications and systems are now more important than ever to businesses. Many of these systems generate or process the data used to compile a business's financial accounts. As an added bonus, auditors often rely on the data and reports generated by these platforms. Understanding the IT-specific risks that could affect the accuracy and dependability of financial transactions and data moving through a business's systems is crucial in this regard. SAP, Oracle, Peoplesoft, TALLY, and others are a few examples of ERP systems [9]. These are on the market and may be bought or customized to meet specific needs. Additionally, the businesses are able to create their own ERP systems. Businesses with specialized industries with complicated processes and potentially unusual transactions, such as oil and gas, etc. These fall under the category of developed ERP systems.

ERP Environment Related Content

Enterprise resource planning is referred to as ERP. It is a result of the advancement of computer technology and initially surfaced in the 1990s. Improving overall management of the supply chain between the organization's upstream and downstream, without disregarding any of the participants, is the key goal in order to maximize the distribution of enterprise resources and improve the enterprise's competitiveness in the market. The following features make up the majority of its attributes. The ERP system is integrated, to start. It can do scientific analysis, organize and manage all information data, and arrange all company data into a database. Second, a variety of data and information related to the enterprise's business operations may be transmitted concurrently via the ERP system. Its real-time information transmission feature ensures that data and information are sent on time. Additionally, it may assist business executives in quickly understanding the enterprise's real operating realities and making the right operational choices. Lastly, the ERP system is accessible. It may function in a public setting. Fourthly, dynamic management work may be implemented by the ERP system, which helps the business better adapt to the market.

An ERP system has the advantage of enhancing organizational efficiency by eliminating manual procedures and automating certain tasks. An ERP solution may be used to build up an electronic accounts payable workflow, where vendor, amount, cost center, account, location, or project records all official permissions needed for the organization’s processes. An approval procedure for purchase orders that is recorded in the ERP program is another option. Additionally, an AAO-MLRFR Algorithm system aids the auditor in evaluating the efficacy of

the business's processes and testing internal controls. Limiting employee authorizations, safeguarding and preserving assets, and separating jobs are the main points of emphasis. The best approach to internal control is to implement it inside an ERP program; this will be the most economical and efficient method in the long run.

II. Literature Review

Business executives' methods for implementing sufficient internal controls in enterprise resource planning (ERP) are examined in this case study. These ideas were successfully implemented by seven Mississippi, USA, company executives. Interviews, observations, and internal documents were used to gather data. Three themes surfaced: resolving problems, overcoming implementation hurdles, and internal control measures. Reviewing role-based access restrictions on a regular basis is one of the recommendations. Opportunities for steady work might result from positive social transformation [10].This document offers a thorough reference on how internal auditing functions are affected by Enterprise Resource Planning (ERP) systems. It incorporates information from a large number of scholarly research and organizational documents released since 2011. The research dives into the pros and cons of utilizing an ERP system for internal auditing procedures [11].

The information age's quick progress has made computers more widely used in many domains, including company accounting. But there are hazards associated with this as well. Prioritizing internal control audits, consistently enhancing work quality and efficiency, and putting remedies in place to enhance computer accounting internal control and audit in Chinese firms are all essential for improved development and long-term growth [12]. This research looks at the performance of Saudi Arabian listed companies in regard to good corporate governance, focusing on the role of effective ERP and internal auditing. The findings imply that effective ERP adoption improves governance and that sound governance has a favorable effect on corporate performance. A limited sample size and the inability to generalize to all listed firms are two of the study's shortcomings [13]. This study looks into the relationship between earnings management (EM) and internal control (IC) in publicly traded Chinese companies. The findings indicate a negative relationship between IC and EM levels, with high-quality IC lowering profits management via actual and accounting decisions. Financial fraud may result from IC vulnerability[14]. With an emphasis on cultural concerns, this study examines the difficulties encountered by western ERP roll-outs in China and offers recommendations for ways to increase project success rates [15]. This essay examines issues with a company's IT system audits, emphasizing ineffective management, a lack of skilled personnel, and practical remedies. It makes recommendations for hardware improvements, technical advice, and control solutions.Using a case study method, look at the Alibaba and find that audits can cause the stock price to fall and other significant changes to occur [16].

Methodology

Lower the risk of internal control and improve internal auditing

Strengthening the oversight of internal accounting is the primary goal of internal audit, a crucial component of corporate internal control. Internal audits typically involve the following: auditing accounting data to ensure accuracy and compliance with internal control requirements for signatures; examining the consistency of written and electronic data; and monitoring that data storage practices adhere to legal standards [17]. The accounting information system and human-machine interaction control management are the fundamental methods of doing business in the ERP environment; hence, it should enhance the internal audit system to further reduce the risk of internal control. The ERP Environment Accounting Information Systems should be known to internal auditors [18]. Internal auditors should, in fact, pay close attention to their own bookkeeping. If issues are discovered, one should focus on their own accounting expertise, beginning with the real scenario by determining the optimal strategy to ensure the security and effectiveness of the accounting information system, leading to an improvement in accounting efficiency.

Dataset

Events and situations that are important for financial reporting but are not part of regular transactions may sometimes be recorded in information systems. By "non-standard journal entries," it is imply. The procedure and controls used to record such entries must be understood by the auditor. Projects funded by the Chinese government

that were carried out between 2012 and 2024 are geolocated in this dataset. The government funding have twenty projects. Both Chinese aid and non-concessional government finance are included in the dataset. The kaggle.com database provides the following examples of an information systems environment that is relevant to financial reports:

- The audit client is a company with several branches, warehouses, retail locations, etc., all throughout the nation. Each of these areas may be used for transactions like debit/credit notes, invoice inputs, etc.
- The audit's customer works in retail. Sales are tracked at their many Points of Sale (POS) locations. At the time of invoicing, these point-of-sale devices have to be equipped with the most recent pricing catalog.
- The IT sector employs the audit client. In addition to markup, income is received from milestone billing, project time, and other sources. Numerous apps record this data, and the connected ERP raises the invoice. In order to develop the audit approach, the data collected during the IT environment knowledge phase should be summarized.

An automated environment is one that depends more on the technologies that power the operations and involves less human process involvement. In an automated setting, there are several hazards. For instance, the quantity and placement of apps, their interfaces, their security, etc., might all be contributing factors to the hazards. During the General IT Controls and Automated Application Controls workshops, one will get a deeper understanding of the elements that comprise an Automated Environment.

Artificial intelligence (AI) and internal control

Artificial intelligence (AI) has the ability to automate and streamline numerous control procedures, which could greatly increase the effectiveness of internal controls.AI may improve internal control in the following ways:
• Automated monitoring: AI may be used to automate the tracking of company transactions and activities, which can assist in the real-time identification of possible control concerns. Artificial intelligence (AI) systems, for instance, may be taught to recognize odd transactions or trends that can point to fraud or mistakes.
• Predictive analytics driven by the vast amounts of data that AI can sift through allow it to detect trends and patterns that humans might miss.

This may facilitate the early identification of any control problems, enabling prompt remedial action.
• Natural language processing: AI may be used to examine unstructured data, such chat logs or emails, in order to spot any hazards or control problems. This may assist in identifying any control problems that conventional monitoring techniques might miss.
• Automation of robotic processes: AI may be used to automate a number of repetitive operations, such data input or reconciliation, which can lower the possibility of mistakes and free up resources for more difficult jobs.
• Machine learning: Algorithms may be trained using AI to identify patterns or trends that can point to possible control problems. In the long run, this could help make monitoring and analytics more accurate and efficient.

Artificial Algae Optimization Based on Multi-Linear Random Forest Regression (AAO-MLRFR)

Artificial Algae Optimization (AAO)

Inspiration: By adapting constantly to patterns in user behavior, AAO creates network public opinion analysis. Inspired by microalgal characteristics and behaviors, the AAO is a meta-heuristic optimization approach. Algal colonies are communities of algae that share living space. Every colony is a model for a potential answer. Colonies of algae make up the population, which is illustrated as follows:

$$Popul = \begin{bmatrix} a_{1,1,} & a_{1,2,} & \cdots & a_{1,d} \\ a_{2,1} & a_{2,2} & \cdots & a_{2,d} \\ \vdots & \vdots & \cdots & \vdots \\ a_{OM,1} & a_{OM,2} & \cdots & a_{OM,d} \end{bmatrix} \quad (1)$$

$$j^{th}algalcolony(a_j) = [a_{j,1}, a_{j,2}, \ldots, a_{j,d}] \quad (2)$$

where $A_j$is the algal cell in the j^{th} dimension of j^{th} algal colony, d is the algal colony's dimensions, and PN is the population's number of algal colonies. An algal colony is a collection of facts that are believed to have solution dimensions. In search of a suitable home that supplies nutrients, the algae colony moves in unison. In an attempt to achieve a higher level, the analysis undergoes evolution, changes, and expansion. Public opinion holds that the most effective way to achieve positive user behavior is to position the colony appropriately. During the search, the growth of each colony of algae is determined by the amount of light and nutrients that reach it. Every single algal colony begins at a size of one, or greatness-G. Using public opinion (l) and tweet data (Equations (3) and (4)), one can calculate the growth of the algal colony.

$$\mu_j^s = \frac{\mu_{max}^s \times T^s}{L_t^s + T^s} \quad (3)$$

$$P_t^{s+1} = P_t^s + \mu_j^s P_j^s \quad (4)$$

In this context, P_j^s represents the j^th algal colony size at time s, L_t^s stands for the substrate saturation factor at times (usually taken to be half of H), and μ_max^s denotes the highest particular rate of growth at that time in user financial evaluation. The three primary components of AAO are adaptability, helical movement, and the evolutionary process.

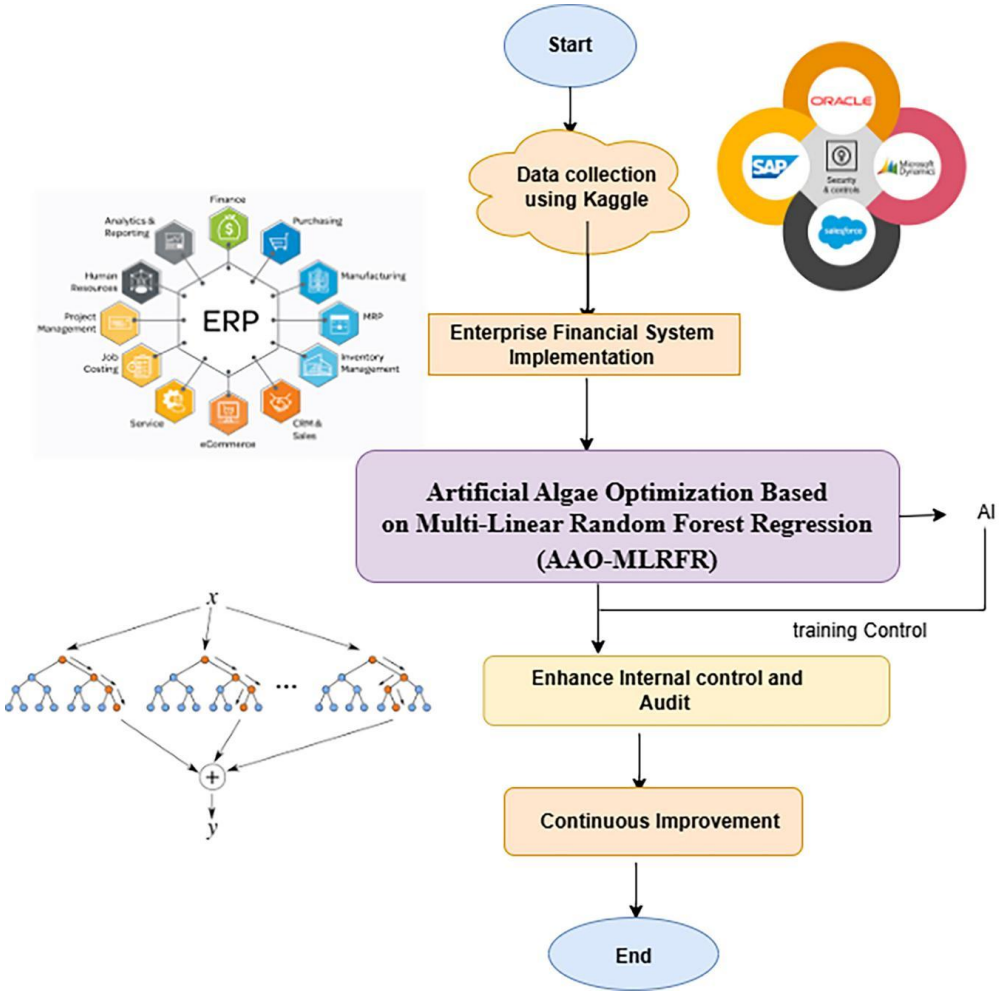

Figure 1: Proposed Model

Multi-Linear Random Forest Regression (MLRFR)

Multi-linear regression is a widely used ERP analysis approach that elucidates the relationship between continuous variables. A "linear regression" is so called because the relationship between the two variables—the independent one on the X-axis and the dependent one on the Y-axis—is a straight line. When there is just one input variable (x), multi-linear regression is defined. However, when there are several input variables, multi-linear regression is usedThe relationship between variables in a linear regression model is basically depicted by a straight line with a predetermined slope. The random forest's decision trees use choice of grouping upon establishment to predict which class the new account sample will belong to. This helps determine which group is more commonly selected. The random forest allows for repeated sampling because it randomly replaces the rows and columns of the input data set. Assuming there are m decision trees, each one requires m sample sets for training. It is not advised to train m trees using whole samples as this would make whole sets ignore the sample set, which will reduce the model's ability to generalize. To achieve prediction classification, one must first collect n samples using replacement, then train m decision trees using these n samples, and so on. It is common practice to use equation 5 of the chain rule when calculating many random variables.

$$p(_{x1,x2.....xn})=p(_{x1})U\ Px(xi|x1\ \ldots..\ xi-n) \quad (5)$$

Random forests need little in the way of mathematical or financial statistical skills from its users because to its high operational efficiency, simplicity in installation, and ease of usage. Along with its many other benefits, random forest can be utilized for both classification and regression tasks at the same time and has a strong overfitting feature.. However, compared to the classification problem, the regression problem's application of random forest produces less favorable outcomes. Producing predictions outside the range of data in the training sample set is not possible because it cannot give a continuous output, which prevents it from solving the regression problem. Overfitting of data is widespread. Random forests' predictive power will be reduced for low-dimensional data sets since it performs better on high-dimensional and imbalanced data sets.

When it comes to learning, the model will perform poorly if the ERP system's generalization financial statement inaccuracy is large and better if it is the contrary. Equation 6 defines the generalization error.

$$Rexp(f) = Ep[L(Y, f(X)\ p(x, y)\ dxdy] \quad (6)$$

The primary external factors that need to be considered are the number and type of categories, the size of the training sample, and the data from the imbalance sample. Equation 7 below displays the index formula, and generally speaking, an algorithm's classification becomes better with more separation accuracy.

$$I(y_i, y_i) = \frac{(y_i \cap y_i)}{|y_i \cup y_i|} \quad (7)$$

The sample prediction scenario yields the algorithm's overall test set performance. The coefficient is 1 if the actual outcome is totally consistent with the predicted one. Here is how Equation 8 deals with the indicators of multi-linear regression in this study:

$$z_{ijt} = \frac{x_{ijt} - \min\ (x_{ijt})}{\max_{(x_{ijt})} - min((x_{ijt}))} \quad (8)$$

Equation (9) computes the proportion of the standardized metrics.

$$\phi_{ijt} = \frac{z_{ijt}}{\sum_{j=1}^{N} \sum_{t=1}^{T} z_{ijt}} \quad (9)$$

Equation (10) computes the information Audit in ERP system entropy of index i.

$$e_i = -\frac{1}{1n(NXT)} \sum_{j=1}^{N} \sum_{t=1}^{T} \phi_{ijt}\ \ X\ 1n(\phi_{ijt}) \quad (10)$$

Equation (11) computes the information financial internal entropy redundancy of index i.

$$d_i = 1 - e_i \quad (11)$$

Equation (12) computes the internal control and audit regression i.

$$p_i = \frac{d_i}{\sum_{i=1}^{m} d_i} \quad (12)$$

Lastly, equation (13) computes the degree of multi linear regression development for every statement for every year.

$$RFR_{jt} = \sum_{i=1}^{M} \sum_{j=1}^{m} \sum_{t=1}^{m} z_{ijt} \, \mathrm{X} \, w_i \quad (13)$$

Equation 12,13 is based on the market prediction regression p_i and the standardised indicators z_{ijt}. The value of RFR_{jt}, which ranges from 0 to 1, represents the province j multi linear regression development level in year t. To validate the research hypotheses, first build the regression model below to show how the optimization path affects sufficient development. Equation 14 gives the model's shape as follows:

$$RFR_{nt} = \beta Digital_{nt} + \gamma X_{nt} + C_n + \alpha_t + V_{nt} \quad (14)$$

The variables RFR_{nt} and 〖$Digital_{nt}$ stand for the level of multilinear random forest regression and sufficient growth of province n in year t, respectively.

The regression coefficient β shows how the internal control affects the multilinear based random forest regression adequate development. V_{nt} represents random disturbance, C_n and α_t time- and individual-fixed effects, respectively, and X_{nt} a number of variables under control. Then, to better understand the possible trend of the financial internal influence on ML-RFR and adequate development, examine if the intermediate variable is total factor productivity. Thus, based on model (14), construct a multilinear regression model that accounts for the interplay between financial internal factors and factor productivity overall, as well as an ERP system audit's effect on overall factor productivity, in order to determine how best to ensure balanced and adequate development.

Next, one will assess the significant judgment and matching regression coefficient to see whether there is an intermediate influence. Equations 15 and 16 illustrate the structure of the model as follows:

$$TFP_{nt} = \beta Digital_{nt} + \gamma X_{nt} + C_n + \alpha_t + V_{nt} \quad (15)$$

$$RFR_{nt} = \beta_1 Digital_{nt} + \beta_2 TFP_{nt} + \gamma X_{nt} + C_n + \alpha_t + V_{nt} \quad (16)$$

The other variables' definitions align with model (13), and 〖TFP〗_nt depicts the total factor production level in province n in year t. Controlling the input variables is simpler than controlling the output variables. For this reason, the factor metric's total productivity using the input-driven MLRFR algorithm that is based on the variable returns are optimized. Equation 17 depicts the standard input-oriented MLRFR model as it currently stands.

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$$min[\theta - \varepsilon(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+)] \quad (17)$$

$$\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta x_i 0 \qquad \mathrm{i} = 1,2 \ldots\ldots\ldots\ldots, \mathrm{m}$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_r 0 \qquad \mathrm{r} = 1,2 \ldots\ldots\ldots\ldots, \mathrm{s} \quad (18)$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j \geq 0 \qquad \mathrm{j} = 1,2 \ldots\ldots, \mathrm{n}$$

In equation(18), the efficiency value is denoted by δ, the non-Archimedean infinitesimal is represented by ε, the input ,output variables are denoted by x and y, respectively, and the weight is represented by λ.The capital stock

and labour as the input variables are chosen; the fixed asset investment is known as the capital stock that has been determined using the perpetual inventory method, and the labour is the total count of employees. The regional ML-RFR serves as the output indicator. The fixed asset investment and the multilinear regression are translated to the actual value among them.

Algorithm 1: Pseudo code for the AAO-MLRFR Algorithm

To Execute a regression sample:
for x=1 to a do
  Random regression sample by the training data p_i with replacement to produce d_i
  Create a new root regression node, RFR_{jt} containing p_i
  execute BuiltNewTree(RFR_{jt})
end for
BuiltNewTree(RFR_{jt}):
if RFR_{jt} containsinstances of only another class then
  return
else
  Random selected y% of the possibility split criteria in RFR_{jt}
  Select the criteria C with the highest database data information into split
  Create new child root node of $j^{th}algalcolony(a_j) = [a_{j,1}, a_{j,2}, \dots, a_{j,d}]$
call BuiltNewTree(RFR_{jt}):
end if

III. Results and Discussion

Using Python 3.10.1 software and the Tensor Flow/Keras or scikit learn technique, a Windows 10 laptop with an Intel i7 core CPU and 8GB of RAM was modeled. The current methods, such as Bigdata [21], Traditional Random Forest (RF) [20], and One-Class Support Vector Machine with a Convolutional Neural Network (OCSVM-CNN) [19], are compared to under this section.

The following specifications are used: F1 score, Accuracy, Precision, Specificity and Sensitivity.

Evaluation metrics: The confusion matrix, a N*N matrix that gauges how effectively the machine learning model classifies data, is used to assess the success of our approach. In addition to assessing accurate classifications, the confusion matrix also indicates the quantity of incorrect categories.

The matrix consists of the following four parts: The number of positive samples that are correctly identified as such is called the True Positive (TP). The True Negative (TN) is the percentage of false negatives that are actually false negatives.
False Positives (FP) refer to the number of negative samples that are mistakenly classified as positive. By definition, a false negative (FN) is a positive sample that is mistakenly classified as a negative one.

The evaluation metrics used in this study are described in detail.

1) **Accuracy:** A common statistical metric for assessing machine learning classification techniques is accuracy. By displaying the likelihood of a class's actual value, it provides an approximation of algorithm efficiency. The following is used to compute it 1:

$$Accuracy \rightarrow \frac{TP+TN}{TP+FP+FN+TN} \quad (1)$$

When discussing accuracy in the enterprise financial internal control of database using ERP system, it is meant to refer to the extent to which a efficient model or algorithm accurately recognizes and categorizes outcomes connected to optimization method. The general accuracy of a model's predictions can be assessed using this

common performance indicator. Figure 2 depicts the accuracy of suggested and current techniques. Table 1 depicts the results of accuracy. When compared the proposed method is reach higher accuracy (98.7%) than the OCSVM-CNN (85.7%), Random Forest (89.6%), and Bigdata (77.4%) existing methods.

Table 1: Result of accuracy

Methods	Accuracy (%)
OCSVM-CNN	85.7
Random Forest	89.6
Big Data	77.4
AAO-MLRFR [Proposed]	98.7

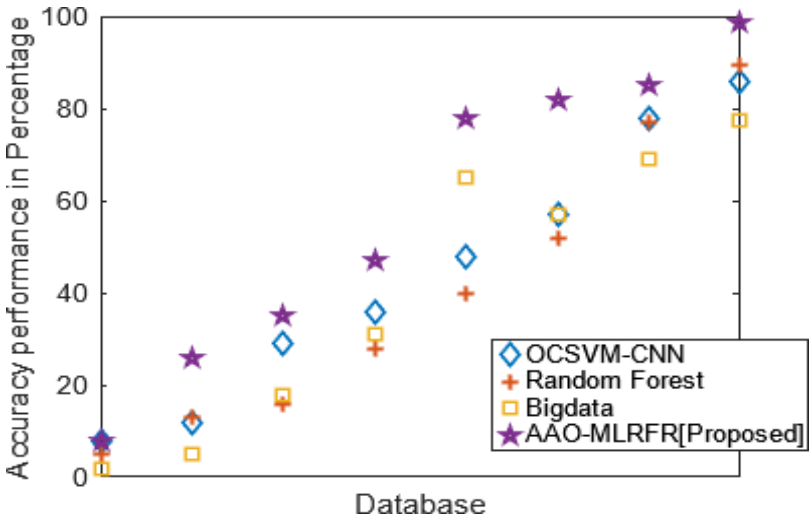


Figure 2: Outcome of Accuracy

2) **Precision:** Precision is an additional metric for evaluation; it shows the ratio of true positive samples to total positive observations in the dataset for predictions. For its calculation, the following is utilized (2):

$$Precision \rightarrow \frac{TP}{TP+FP} \quad (2)$$

In ERP system analysis, precision is a performance metric used in financial internal control that evaluates how effectively an ERP system model forecasts positive outcomes compared to the actual favorable outcomes. When the model produces such a prediction, it provides information on how well it can recognize and classify occurrences as positive.

If the model consistently predicts an improvement in ERP system efficiency, as shown by a high accuracy score, then it likely has a low false positive rate. The accuracy of the suggested and existing approaches is shown in Figure 3. The accuracy results are shown in Table 2. The suggested approach outperforms the current OCSVM-CNN (84%), Random Forest (83.5%), and Bigdata (75.2%) in terms of accuracy (97.8%).

Table 2: Outcomes of precision

Methods	Precision (%)
OCSVM-CNN	84
Random Forest	83.5
Bigdata	75.2
AAO-MLRFR [Proposed]	97.8

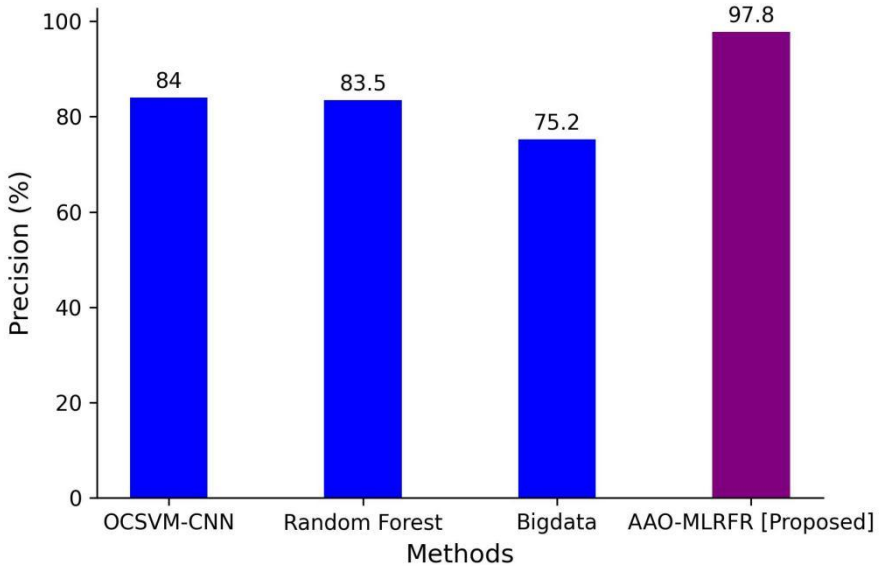


Figure 3: Precision of the proposed and existing methods

3) **Specificity.** The percentage of samples that really fall into the negative class and are accurately identified by the model relative to all samples labeled as negative is known as specificity.

$$Specificity = TrueNegatives/(TrueNegatives + FalsePositive) \quad (3)$$

A high level of specificity shows that the model has been trained correctly to detect negative samples. Sensitivity, recall, or the true positive rate is a performance measure that measures a prediction model's ability to differentiate between positive cases and all positive occurrences. It is used in career planning analysis and other contexts. Models with high sensitivity ratings are excellent at spotting real threats and reducing lost opportunities.. It is especially useful when there is a significant chance of missing a true positive. The specificity of a prediction model is measured by how well it can identify negative cases out of all real negative occurrences. This performance metric finds application in lifelong education analysis and other similar contexts.

The ability of the model is to select instances from the entire set that do not possess a given property is the main point. The proposed technique provides better sensitivity (96.5%) and specificity (93.3%) than the existing OCSVM-CNN (88.5%), RF (87.3%), and Big data (80.3%) methods. Figure 4 shows a comparison of the proposed and existing methods' sensitivity and specificity. Table 3 displays the outcomes of the tests for sensitivity and specificity.

Table 3: Outcomes of the sensitivity and specificity

Methods	Sensitivity	Specificity
OCSVM-CNN	85.6	88.5
Random Forest	83	87.3
Big Data	79	80.3
AAO-MLRFR [Proposed]	96.5	93.3

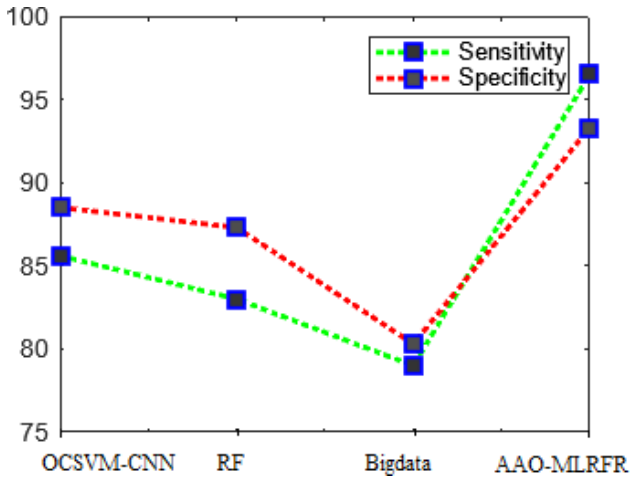


Figure 4: Compare the sensitivity and specificity with other methods

4). **F1- Score**

In this assessment, accuracy and recall are considered. It is the weighted average of recall and accuracy. The F1-Score score of 0 represents the model's worst-case scenario, demonstrating that it completely mispredicts the data from ant test samples. However, when the F1-Score value is 1, the model predicts classes perfectly. The following is used to compute it:

$$F1 - Score \rightarrow 2 * \frac{(Precision \times Recall)}{(Precision + Recall)} \quad (4)$$

The F1-score assesses the model's accuracy in accurately categorizing situations as ERP system error perform in financial internal while also taking into consideration the examples that were overlooked or erroneously categorized.

It is a valuable tool for assessing and comparing various prediction models since it offers a single number that summarises the model's effectiveness in capturing both kinds of optimization path of enterprise financial internal control and audit with ERP system. Figure 5 illustrates the F1-score of both the current and proposed methods. Table 4 shows the F1-score results.The proposed method is higher f1-score (95.7%) than the OCSVM-CNN (84.9%), RF (80%), and Bigdata (78.7%) existing methods.

Table 4: Results of F1-score

Criteria	OCSVM-CNN	RF	Big data	AAO-MLRFR [Proposed]
Financial Management in Enterprises	83.3	82.4	75	90.4
Budget Management	84.2	85.1	72.4	92.8
High integration	79.1	88.7	70.7	93.5
Insufficient understanding	82.5	84.2	76.7	91.4
Data quality risk	84.9	82	78.7	95.7

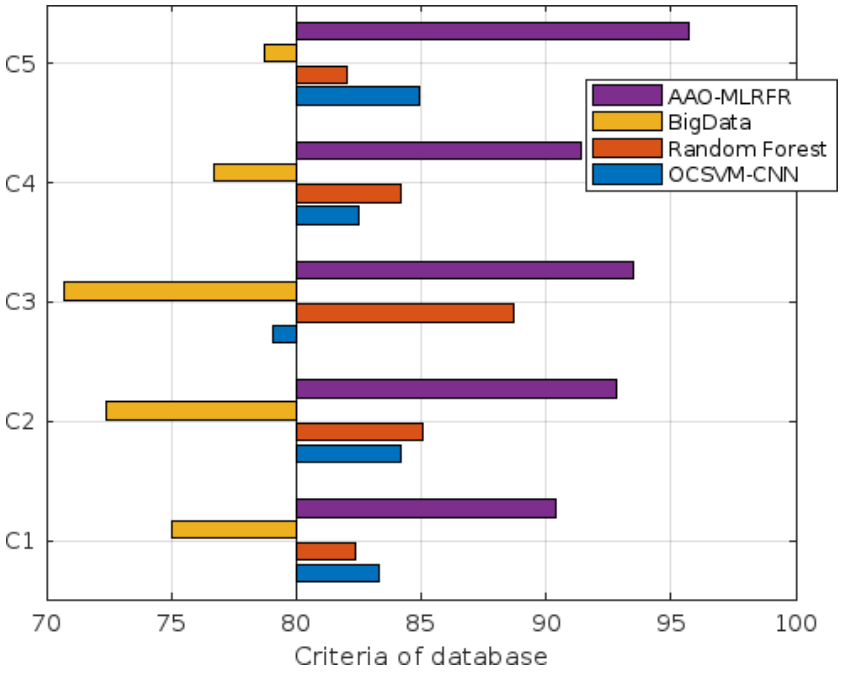
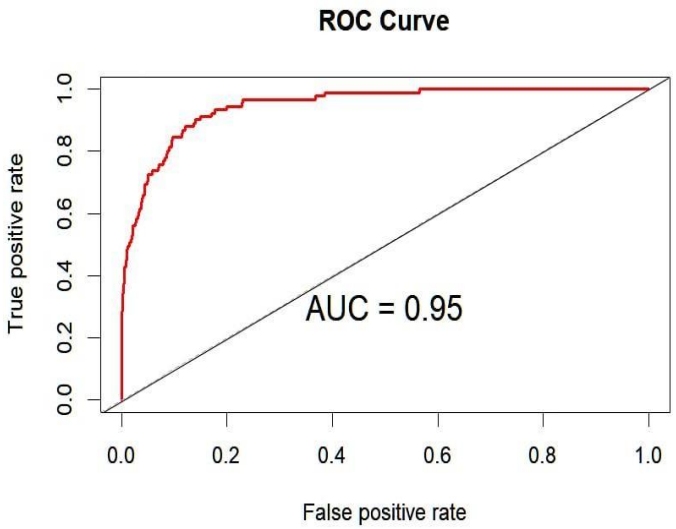


Figure 5: F1-score of the proposed and existing methods

5) **AUC-ROC:** The area covered by the curve The area under the curve, or AUC, is a statistic that is produced by the Receiver Operator Characteristic (ROC) curve. It represents a binary classification model's ability to differentiate between positive and negative class samples, as the name suggests. This metric represents the value of the ROC curve's area.

The better the model identifies the data points, the higher the AUC measure. AUC of 0.5 indicates that the binary classifier either makes a random guess or predicts a constant class for each given sample.

Figure 6: ROC curve for AAO-MLRFR Algorithm



The receiver operating characteristic curve (ROC) is a graph that shows how well a classification algorithm performs at each classification threshold. Both the real and false positive parameters are shown by this curve.AUC, or area under the curve, is a ROC curve description that indicates how well a classifier can distinguish between classes. The model is more effective at discriminating between the positive and negative groups the

higher its AUC value. A perfect model with a TPR of 1.0 and an FPR of 0.0 at some threshold can be represented by either a point at (0, 1), assuming all other thresholds are ignored.The ROC is a helpful metric for evaluating the performance of distinct models, provided that the dataset is fairly balanced.The general rule is that a larger area under the curve indicates a better model. Figure 6 shows that the AUC curve of the proposed model [AAO-MLRFR] has the highest accuracy at 0.95.

IV. Conclusion

In the context of an ERP environment, the importance of enterprise resource planning (ERP) systems in maintaining internal control over financial information systems should not be underestimated by businesses. Enhancing the internal environment, managing financial information records to a higher standard, strengthening internal audits, and ensuring accounting information system managers and systems are financially literate in order to boost operational safety should also prioritized. The role that ERP systems play in enterprise financial data information systems, enhance the economic efficiency of businesses, and boost their competitiveness so that businesses can compete in the market should also be fully utilized. The use of accounting computerization software will increase the company internal control audit's accuracy and consistency. As accounting has grown increasingly computerized, staff members often find themselves devoting a great deal of time and energy to the creation of enterprise internal control audit jobs. Businesses should continuously advance the general degree of internal control informationization, advance the degree of financial computerization, fortify the internal control system and institutional structure, and offer efficient technical assistance for the growth and advancement of businesses. In the process of auditing, auditors should continuously innovate, fully use contemporary media technology and information networks, and further elucidate the auditing contents and audit computerization techniques. Finally, implementing the recommended method allows the enterprise to achieve strong operational results and ensures sustainable growth through the use of financial accounting data internal to the ERP system. It has the potential to mitigate the enterprise's business risk by enhancing the financial accounting information's internal control level from multiple perspectives.

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