Journal of Information Systems Engineering and Management
2025, 10(17s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

5W1H Framework for Application of AI in Power Transmission Companies for Financial Management

Stephen Larkin[1], Mohsin Amjad[2*], Naveed. Ismail[3], Saad Saleem Khan[4]

[1]*CEO, Africa New Energies, United Kingdom*
[2]*Associate Member, Institute of Cost and Management Accountants Pakistan, Pakistan.*
[3]*Ex-Chairman BOD, National Transmission & Despatch Company, Pakistan*
[4]*Electrical Engineering Department, United Arab Emirates University, UAE*
**Corresponding Author: mohsinamjad2853@gmail.com*

ARTICLE INFO

Received: 05 Dec 2024

Revised: 28 Jan 2025

Accepted: 09 Feb 2025

ABSTRACT

By leveraging AI adaptability for financial management in the power transmission organization a robust and self-sustaining financial system can be designed while having smooth operations. The paper has been designed using the 5W1H framework. The AI-based FMS supports preparing budgets, improving risk management, planning taxation, and drafting the legal financing documents that are driven by the maintenance plan, development portfolio and financial circumstances. Apart from the work support, AI is benefiting from automation despite the fact maintains accuracy and efficiency. The decision-making becomes speedy since we can have readily available reports and recommendations on few clicks away. However, the implementation of AI for FMS will also pose some challenges, which mainly indicate the data availability, IT infrastructure and dedicated financial and human resources. AI for FMS implementation generally falls within the purview of the finance department and is jointly carried out with the IT department. The application has been divided into different stages, starting from the avoidance to experimental reached to transformation by flowing through steadiness and expansion, respectively. So, this whole process covers the 5Ws, whereas, the 1H answers the question of how this path can be followed. Thus, need to develop the methodology for data gathering, machine learning, defining parameters and creating financial analysis and forecasting models. The successful execution can make it an indispensable decision-making tool for the organization.

Keywords: Artificial Intelligence, Finance, Optimization, Planning, Forecasting, 5W1H Framework

INTRODUCTION

Artificial Intelligence (AI), unlike other technologies, has gained popularity very rapidly and become the most critical technology in the modern world that is transforming society and economy and has made a remarkable contribution to the digital biosphere. AI is advancing significantly and will progress more swiftly in the coming years. Considering the implications, technologists and policymakers are required to play an active role in the creation of a robust and lucrative AI, duly in view of the short & long-term outputs and consequences [1].

With the rapid globalization and fast flow of information, AI technology has become essential for any organization to lead in the sector and expand while managing the optimized resources. Multiple pillars hold the organizational structure, including business planning, project management and especially financial management (FM), which plays an imperative role in sustainability. It is worth highlighting that financial management is becoming more important and complex, which warrants AI to support an intelligent financial management system (FMS). Therefore, similarly, the power transmission companies must square up to the contemporary status and pay attention towards designing of a smart FMS. This development needs to be standardized to keep it updated with global practices and maintain the sustainability of the organization. [2].

Although there are many business decision-related tools and methods; however, analyzing historical data and the integration of the machine learning uplift the scenario-building aspect. The AI-driven models not just only provide the "what-if" analysis but also propose strategies to attain the opportunities and mitigate the potential risks. Further, the present tools are only based on historical data. If machine learning is only based on it, then it provides generic results and recommendations with a limited approach, which could be incomplete or misleading suggestions. The question arises that to remain competitive and for the decision-making in the industry, we need to compare our business with the top-of-the-list companies and other industries in real-time instead of analyzing our historical data only [3].

The AI future self-thinking computing is attracting all the countries to develop robust economies and taking steps towards becoming world leaders. To reap the positive benefits of AI, companies and governments are required to make heavy investments on human resources, IT equipment and networking. However, the consequences are difficult to foresee as there is no experience to understand the AI real benefits. Further, at the global level, there may be some countries at an advantageous level, but some may be a loser so, the net results may be different compared to the anticipated. Following to this tendency, there is a sharp increase in the research literature and number of patents, indicating the transition from academic knowledge to practical implementation in manufacturing and services. [4].

While considering electricity transmission and utility companies, the use of AI in financial management is very much limited due to the availability of data and mainly being categorized as an essential service, where only a few of the parameters account for in performance monitoring. Whereas this process is being performed in different private sector commercial companies having ample financial resources to have dedicated teams and equipment and the intervention of human-provided external data into existing platforms, there is still room for improvement in existing applications and implementing the same in the energy sector to have first mover and competitive advantage. There is a need to employ the AI system in a real-time or hybrid system for data processing and setting the preset parameters for desired output. Since, AI algorithms are designed to perform the analysis of extensive volumes of data; therefore, it classifies the data into different segments and identify the overlooked patterns. This provides valuable insight for informed decisions before arriving at a conclusion [5].

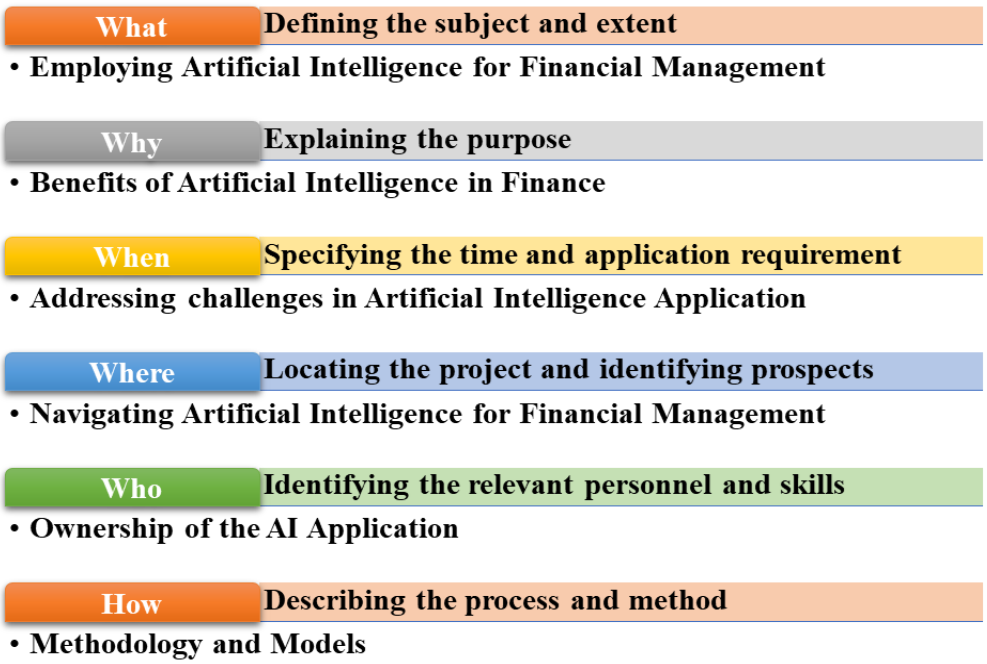

Figure 1: 5W1H framework for AI application for FM

For an industry-based comparison among transmission companies, AI must cover the three aspects that have been narrated from easy to hard in terms of data availability. Firstly, the organization's historical data is always available to the company. Secondly, the economic conditions that AI currently provide are generic in nature and need to be specific for a given industry, which may impact business decisions, including government policies, taxation, local

laws, economic growth, political alignments, environmental concerns and international factors for cross-border transmissions. Thirdly, the main thing is the data of the comparative organization. In the current scenario, this requires extra time and human involvement with various limitations [6]. So there the AI can arrange the available public data in the shortest time through publications available on the internet, regulatory submission, social media accounts and transactions with the stakeholders. The most authentic and easiest way to have the financial data is from the annual accounts on the company's website and mandatory filings to the regulator. The upcoming financial plan and direction of the company can be ascertained from its investment plan in the network expansion, contracts advertised, and acquisition of new financing. Upon arrangement of the data, AI can compare both company's financial health and provide key focus areas for improvement where the company is lacking and carrying the potential to devalue the business. This exercise can lead the business towards improvement and increased efficiency with better resource allocation and value addition output [7], [8].

Going forward to the implementation the AI, the framework of 5W1H has been conglomerated in this paper to encompass the essential factors of AI application from different aspects. The 5W1H framework stands for 5W (What, Why, When, Who, Where) 1H (How), as depicted in Figure 1, will comprehensively be applied for the said purposes. This will also help to identify the key areas and responsibilities to introduce AI in the organization .

This paper aims to place the idea of AI-based financial planning within the company using the 5W1H framework and provide valued input for formulating sustainable strategies to strive with other comparable organizations. This paper will describe the AI benefits and challenges in financial management functions. The study will be helpful for the dissertation on AI in financial management systems and for crafting strategies for developing new models.

WHAT: EMPLOYING AI IN FINANCIAL MANAGEMENT

The financial management landscape has experienced a significant transformation with artificial intelligence (AI) integration and machine learning. Besides handling routine tasks, AI manages contract agreements, project management, financing methods for development projects, investment options for new power projects and transmission networks. This article argues that AI has transformed project financing through enhanced project evaluation, risk assessment, and stakeholder management.

Budgeting and forecasting

AI can process large amounts of historical performance data that includes internal transactional data and covers economic indicators, market tendencies, and factors affecting the industry and company profile. Based on these analytics, it identifies the unique, problematic, and time-consuming patterns for humans to draw. These trends and patterns entail predicting future outcomes. AI can better advise budgeting assertions with more accuracy and comprehensive forecasts. The transmission network companies can employ these forecasts to draft the budget documents more precisely while allocating resources for maintenance and development proficiently and mitigating potential financial risks.

Drafting of contract agreements

Financial management drives through project development, wherein the stepping stone is the contract agreement for the project execution. The contracts define all the clauses for each project phase, including procurements and payment schedules. In the past, the drafting of the contracts was time-consuming and costly and required iterations. AI streamlines the process of preparing legal documents efficiently and saves the precious time of legal and contract management departments. The AI customizes these documents through machine learning according to the different scenarios and project needs. Furthermore, upon review of the papers, AI duly addresses the comments at a centralized level. The accuracy and standardization of documents are achieved with less effort. Therefore, the legal teams can utilize the time for complex and priority tasks.

Intelligent risk assessment

Financial management has the inherent name of risk management, and AI has revolutionized this task with advanced methodologies and tools that support recognizing and mitigating potential risks with unprecedented precision. While allocating the financial resources to the development and operations of the project, the risk aspect is always critical for the finalization of any strategy. It involves the scarcity of resources and the impact of external and internal factors. The traditional methods usually depend on historical data and have minimal capability of adapting to emerging

threats. Divergently, AI leverages real-time data analytics and a sophisticated set of rules to provide dynamic, improved, proactive and accurate risk assessment in the least time. AI core uses machine learning, which processes and analyzes the immense amount and range of data from various sources; therefore, AI algorithms process the data involving numerous risks, provide insight into uncovering patterns and correlate the projections for an informed decision. A major advantage of AI is that it can identify the delicate variances and nonconformities from the regular patterns that may camouflage and have potential risks [9].

Contrary to the traditional retrospective analysis, AI captures the sudden and fast-evolving risks for prompt response against he emerging threats to take preventive measures, including risk exposure adjustment, escalation of issues, and buffers for the expected losses. After identifying the patterns through structured data such as financial statements and unstructured data, including articles, news and social media posts to build holistic view can be made for a focused decision. AI predicts the anticipated risks that can adversely affect the business value and operations. However, there are also possibilities for positive risks, which means growth in the sectors reaped by the competitors. Thus, risk predictions help in preparing for the mitigation. AI platforms perform real-time monitoring that detects potential risks and generates stakeholder alerts.

AI also proposed risk mitigation strategies based on risk assessment to reduce project delays and cost overruns. These strategies also proactively prevent damage escalation and simultaneously warrant a quick resolution.

Operational efficiency

AI-driven predictive analytics plays a crucial role in operational efficiency enhancement within the organization. By analyzing the historical transactional data and conception the processes, future trends can be projected that helps in streamling and optimizing the operations to enhance overall organizational performance. At the core of AI, machine learning deals with the vast amount of transactions, operational parameters and organizational matrices to identify the trends and correlation for precise prediction. For example, the model can forecast the volume of transactions, processing time, anticipated shortcomings, personnel requirements, customized maintenance schedules etc., for effective utilization of financial resources.

By predicting future transactions, power companies can optimize cash flows, manage inventories, and right staffing. Further, while processing the transactions and arranging the funds, AI can raise the flags for the prearrangement of requisite documents and approvals to avoid delays and prevent bottlenecks. AI analytics uncovers the inefficiencies and supports targeted process improvements, workflow streamlining and reduction in operational costs. The companies can have an idea in advance of the impact on operations while taking any strategic initiatives and can proceed with greater accuracy and confidence. The predictive analysis identifies the early yellow and red flags of disruptions in operations and financial instability, thus allows to take preventive measures. However, it warrants high-quality data and an arduous validation process.

Project evaluation and selection

The transmission sector is considered an essential service in public departments where the selection of projects is an immense challenge while balancing the system requirements, local population needs and financial resources. Currently, this project evaluation and selection is performed in different stages and in separate departments. The segregation of these functions lacks coordination and end outcomes in a short period. By employing AI, all these activities will be performed at a centralized level with a series of outcomes, including technical parameters, matching requirements and financial planning. AI has made the project evaluation more manageable with enhanced due diligence by examining the vast amount of data, lessons learnt from the past and availability of funds through cash flow management. It helps in identifying the optimized portfolios where the investments are made efficiently in line with the organizational strategic objectives and risk appetite. Moreover, the scenarios can stimulate the different factors and their impact on the project's financial benefits. So, the AI provides a data-driven decision that reaps the maximum profitability with a minimum risk level.

Taxation planning

Tax planning is an imperative component of financial management where AI can add significant value in automating the taxation processes with accuracy and assisting with valuable insights. AI helps in numerous ways for taxation planning, like starting the process with automated financial data entry from different sources, including invoices, advance payment vouchers, payroll etc, and comparatively accurate from the manual data entry and also keeps it up-

to-date. Afterwards, AI algorithms check tax compliance in real-time with tax laws and authorities and help the professionals prepare the strategy in compliance with the requirements, thus, reducing the non-compliance risk. Further, as per the requirements, the AI can perform automated return filings by learning from the previous filing and adopting the law changes.

Moreover, for different levels of business volume AI can execute the scenario analysis for financial decision-making and helps to comprehend the tax implications on business policies. This assistance aligns the business goals with the tax efficacy. Due to the data scrutinization functionality, the AI can also identify the dumped tax credits, overpaid taxes and deductions that may be unnoticed in the manual process. This ensures that all the tax credits have been claimed and avail the opportunities to reduce the tax liability.

Lean time management

Human nature is designed for creativity and a person gets tired after doing repetitive tasks, whereas AI can take the time-consuming and routine tasks that can be automated to allow the professional to focus on value-added tasks for strategic planning. Accordingly, AI can enhance lean time management in financial management functions. AI can perform the data entry and then prepare monthly expense reports and reconciliation. AI-powered tools provide predictive analysis to forecast cash flow and financial trends and identify potential risks. The resources will be allocated efficiently for better time management.

Stakeholder management

In financial management, the relationship with the stakeholders is a vital factor. A finance manager needs to manage the financial institutions for financing, vendors for payment schedules and approving authorities for resource allocations.

AI tools assist in coordinating, improving, and collaborating with various stakeholders and streamline the communication process. AI generates customized management reports with informed decisions that update the stakeholders periodically. On one side saving the resources and time and simeltenously also builds trust among stakeholders due to enhanced transparency. Further, AI detects the tendness and analyzes the input and feedback to respond to the queries proactively to address the issues. Suppose a board member requests any information, then AI can prepare the brief instantly and streamline the reporting process without taking much time from the management.

Real-time fraud detection

AI is revolutionizing the financial segment with its real-time fraud detection capability and mitigates fraudulent activities. Traditionally, fraud detection relies on defined rules and post-event examinations, thus providing room for fraud schemes without any glaring impact. AI offers a proactive system for fraud detection and response for loss minimization. AI algorithms are trained for pattern recognition that is linked with the transactions and may specify deceitful behaviour. By analyzing the new data on a continuous basis, machine learning can adapt to emerging fraud tactics, making it highly sophisticated towards suspicious activities in a large dataset that may be overlooked in traditional financial management systems. For example, if AI detects a sudden spike in specific transactions or inactivation of regular transactions against the envisaged activity, it will generate an alert for the company. This upfront alert will enable the managers to make swift responses, even before the completion of the fraudulent transaction.

Moreover, it will also restrict the common issue of false positives, where various times valid transactions are flagged wrongly as suspicious and cause undue operations downtime and wastage of financial resurces and human efforts. A holistic approach evalutes the transactions comprehensively, enabling effective and efficient fraud detection tools. However, to ensure its effectiveness, there is the challenge of data integrity to train the AI model duly considering data security and privacy.

WHY: BENEFITS OF AI IN FINANCE

AI in finance is getting a promising role due to its numerous advantages over conventional work; therefore the likelihood of its implementation is increasing with every passing day. Now most of the accounting software providers are also integrating the AI function in different modules for better financial planning [10] [11]. The reapable benefits are elucidated as follows:

Automation

The process and workflows are now assisted through AI which automates the whole work and eliminates human responsibility. The system autonomously makes decisions for the completion of accounting tasks and prepares financial projections. For example, when a month is closed the AI triggers the month-closing entries, and reconciliations and prepares the financial statements. Following this, the financial plans are also amended based on actual results. This approach makes it flexible for customized and self-controlled operations [1].

Accuracy

Accounting is required to be error-free and in a manual data processing system the margin of error is very high. AI helps to improve data accuracy and also analyzes document processing for recording the entries, such as analytics for invoice processing, processing of commercial agreements, and other tasks through algorithms and automation for each transaction.

Efficiency

Accounting and financial matters are repetitive tasks that make people fed up, and consequently, the efficiency of the work decreases. Since AI is designed to perform large amounts of data-based work, routine work is catered to by AI and spares human resources for new and strategic activities. For example, AI verifies and processes the invoices daily and also summarizes the documents for instant reporting.

Speed

Artificial intelligence can swiftly evaluate large amounts of data, outperforming human processing speed. Furthermore, AI excels at recognizing patterns and revealing links in data that would be difficult for humans to detect. This leads to faster insights for directing decision-making, improving communication in trading, refining risk modelling, managing compliance, and addressing a variety of other activities.

Availability

Unlike human resources, AI is always available and can perform tasks in off hours. Suppose many transactions are pending and we need to submit the financial statements just after the holidays. In that case, AI can work continuously on assigned tasks and we will be in a position to meet our deadlines.

Innovation

The capability of swift analysis for extensive datasets paves the way for distinctive and groundbreaking strategies that outperform competitors. For instance, artificial intelligence can be employed in predictive analytics to prepare financial strategies encompassing short- and long-term goals with multiple avenues.

WHEN: ADDRESSING CHALLENGES IN AI APPLICATION

The implementation of AI is not an easy task and cannot be completed in a short time. It is an ongoing process that requires time and money. AI tools provide valuable input in financial management; however, it also poses some challenges. While solely depending on the AI can cause various hidden mistakes and may generate substandard information that affects the decision-making. In order to implement the AI within the planned timeline and to reduce the risk of failure, there is a need to understand the anticipated challenges [12], [13].

Data accessibility and quality

Since AI is dependent on the data for model training and to identify the patterns; therefore, AI is required to access the whole data and that should be error-free. Any missing data or error can cause bad decisions.

IT infrastructure integration

AI is required to be integrated with the existing IT infrastructure that can support the AI models and also integrate with the accounting software for seamless input. The real-time integration provides the benefit of reduced interruptions and time-saving.

Regulatory communication

AI platforms are trained models with limited human input and in a new and complex situation, the model cannot elucidate the matter. This situation further gets tougher when businesses are required to interact with the other sectors. While presenting the reports before the regulator there are numerous queries raised and require to be responded to by linking them with the other segments of the business. Suppose, if the regulator enquires about the low utilization of the repair and maintenance expenditure then it requires to be linked with the R&M schedule, the AI model can only respond with the historical data patterns in financial terms.

Collaboration with other departments

In a transmission company, numerous departments are functioning in their ambit and have limited interaction with each other like transmission planning, procurement, project execution and finance. The finance activities start upon triggering the payment request from the concerned departments. To train the AI model for financial management the other departments are required to be integrated in a way that all the data pertaining to the payments must come through the AI system. Further, AI financial management is a collaborative work of financial finance, data analysis and IT teams. Therefore, the collaboration of these departments is very crucial for the implementation of AI.

Data security

AI platform possesses all the internal information which warrants the establishment of robust data security arrangements to protect confidential financial information. The security measures must comply with the stipulated regulations and standards of the industry to avoid legal risk and to maintain reputation sanctity. The security measures serve the purpose of protection against data leakages and internal misuse.

Vague objectives

For any paradigm change or implementation, the objective must be clear. An unclear objective may lead to a closed-end without any outcome and a waste of resources. Before implementing AI, the human-developed financial objectives must be clear including problems and challenges which are broadly aligned with the business strategies.

Desired expertise

AI is a new entrant in the business world and expert personnel are very rare in the market. To implement AI the appropriate experts are necessary to make it a success story. With the necessary skills and expertise of machine learning engineers and data scientists, the AI project can be implemented in true spirit.

Budget allocation

Apart from the human resources, a significant budget allocation is required to implement the AI platform and tools in the organization. The AI package includes the cost of IT infrastructure, software, training and regular maintenance. This investment requires a detailed evaluation to weigh the benefits over the cost.

Circumnavigating bias

Machine learning is dependable historical data which is built by humans. There are various events captured in the data which have certain backgrounds and contexts. The patterns based on these data sets may continue in future without any intention, which could cause biased results in those areas if not intervened.

Pilot projects

AI handles challenging and complex data, and accordingly, the implementation is at significant risk if projects face any failure. The project implementation should be started with a well-defined clear objective, and a realistic plan and choose a small segment for pilot testing.

WHERE: NAVIGATING AI FOR FINANCIAL MANAGEMENT

AI is capturing the trend rapidly, and businesses are closely observing the AI opportunities. However, they likewise want to be mindful of the downside hinge. This function generally lies in the head office. The respective department deals with it as per the expected impacts, such as the HR department looking for the personnel, the IT department taking care of the equipment, and the finance department primarily having the responsibility of successful, timely completion and financial resources allocation. [14]

To match with the global trends, the transmission companies need to identify these factors:

- Job Displacement – the workers who are involved in data entry and repetitive tasks will face displacement due to automation.
- Skill lacking – on one hand, we need IT and data scientist experts, and on the other hand, AI will diminish the available skilled workers who are performing their work till the implementation of AI. This will create a huge world of man vs machine and hinder the AI optimal utilization.
- Digital ethics –an automated system creates an adverse impact and an ethical framework needs to be developed proactively on guided principles.
- Privacy issues – AI has access to a widespread large amount of data and it also includes personal information, which can be used without formal permission. So, there is a data breach risk that can cause reputational and legal issues.
- Overreliance – without human involvement, unforeseen and novel scenarios can be mishandled and blind trust will provide poor judgmental decisions.
- Change resistance – stakeholders and employees will have the fear of job displacement, which may create resistance and hold back the implementation of AI tools.

WHO: OWNERSHIP OF THE AI APPLICATION

Since this paper discusses financial management, the primary responsibility falls upon the finance department to determine the path and obtain the desired results. The finance department will set all the parameters, whether it is financial forecasting, cash flow planning, taxation, risk assessment preparing real-time financial reporting with decision-making suggestions. However, it includes a large area of IT infrastructure such as equipment, including client servers and end-user data displaying screens, networking, and allied gadgets; therefore, it should be under the joint ownership of the IT and finance departments with clearly defined performing areas and KPIs .

Gartner et al. have suggested a broad process to overcome the AI implementation challenges that can be followed at a strategic level and divided it into five major phases, as shown in Figure 2.

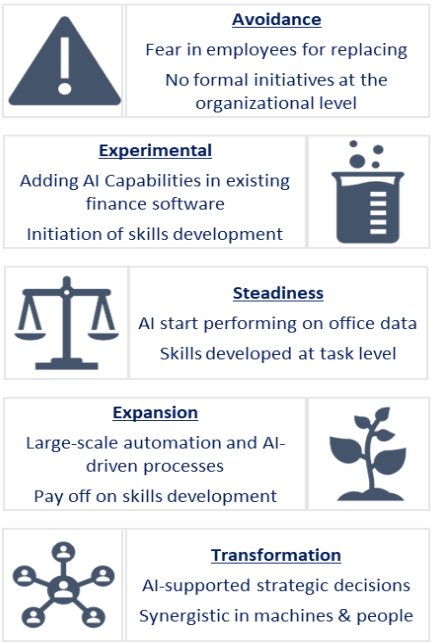

Figure 2: Ownership for AI Application and Maturity

- Avoidance – this process generally starts with high-level management or leadership due to the reluctance to change among the employees, which introduces this concept in the organization for automation, efficient decision making and availing the uncovered opportunities. Initially, employees carry the fear of replacing their jobs with AI.

At this point, there need to take the employees into the confidence that their jobs are not at stake. However, the coordination is required to make it a success story.

- Experimental – to start with the AI, the projects can be initiated with the existing accounting software by adding up the market-based functionalities. Further, at this stage, we can train the employees to develop understanding and ownership.
- Steadiness – the AI feature will start to work on the available office data and generate the matching results; the employees will be trained well to perform the task-level activities to tap the desired outcomes to some extent.
- Expansion – once the AI starts to work, it can be engaged on large-scale data by adding machine and deep learning techniques to automate the processes and uncover the opportunities and hidden patterns that may be overlooked in routine tasks. As a result, the efforts of the employees will start paying off while generating automated decisions.
- Transformation – the organization will be transformed from slothfulness to an informed decision-making entity, consequently, effective and efficient strategic planning. The employee's skill levels will also become unmatchable as they will be well cognizant of the sector situation and start collaborating and coordinating in the organizational development to achieve the common goal.

HOW: METHODOLOGY AND MODELS

By integrating cutting-edge AI methodology with financial optimization principles, this research adopts a comprehensive and novel approach in the dynamic field of electrical power systems. This approach addresses the intricate issues of project scheduling, risk mitigation, and resource allocation from an integrated viewpoint by utilizing the most recent advancements in artificial intelligence and financial modelling .

Extensive data gathering

Large volumes of historical financial data from various electrical power system projects have been systematically compiled to lay the groundwork. For characteristics including project costs, timelines, resource utilization, and external effects, comprehensive data collecting is carried out. This approach ensures the production of a reliable dataset due to its representation and importance in the contemporary commercial contexts of electrical power systems.

Finding and polishing characteristics

This step comprises identifying and enhancing critical components that affect the financial performance, based on domain expertise. The dataset is reduced to a condensed collection of features using sophisticated statistical techniques, including dimensionality reduction and correlation analysis, which are comprehensive and skilled at capturing the minute intricacies of electrical power system projects.

Constructing the Model for Machine Learning

This level emphasises developing a sophisticated collection and suitable application of machine-learning models. These meticulously crafted models include risk-aware categorization models, advanced regression techniques for precise cost prediction, and time series analysis models for project schedule prediction. The choice of these approaches is directed by the inherent features of the financial optimization problem being discussed.

Validation and Training

To boost forecasting accuracy in FM, the machine learning models experienced rigorous training operations that optimize their parameters. After that, thorough validation procedures are performed on a different dataset to assess the models' generalizability and identify any potential overfitting or underfitting issues.

Easy Integration with the Framework for AI Analytics

Machine learning models are smoothly integrated into an all-inclusive AI analytics platform. Financial projections may be dynamically recalibrated and modified because to this system's ability to integrate real-time information streams and external influencing factors. An environment that is adaptable to changing project dynamics and allows for continuous learning is produced by this type of integration.

Optimization Algorithm Implementation

The financial optimization process is improved using state-of-the-art optimization techniques. Metaheuristic methods such as genetic computations and simulated strengthening are used to explore complex solution spaces. By advancing toward the most effective resource allocation techniques, they hope to enhance the overall financial outcomes of electrical power system projects.

Sensitivity Analysis

A comprehensive sensitivity analysis is performed to improve the interpretation and dependency of the models. By evaluating the influence of various variables on financial estimations, this research offers insights into significant factors impacting project financing. When it comes to helping decision-makers choose initiatives for the most significant impact, these findings are invaluable.

For electrical power system projects, this combination of strategic components leads to offering a comprehensive, adaptable, and state-of-the-art framework for financial optimization. Electrical power systems is a dynamic and growing topic, and the suggested approach is made to address complicated problems that arise in this sector.

Financial Management and Forecasting Model

To develop the financial management model, the model needs to be split into different sets, mainly including the input and output. These two links with the AI that has the functionality of algorithm and data processing, as narrated in Figure 3. As an input segment, we need to have technological support and financial data as already mentioned in preceding sections. Then, taking the input, the AI will start analyzing the data and identify the similarities and differences to develop the patterns to generate the outputs. While processing data, AI evaluates the data with input parameters and generates the forecasting and decision in terms of revenue growth and cost reduction, duly formulating the risk strategies.

Apart from the financial results, the AI suggests internal planning for sustainability, like expanding the operations productions and making strategies to deal with the competitors. Further, regulatory compliance and reporting may be made with the automated system while maximizing profitability.

Upon incorporating new data in the system, AI models quickly analyzes the data to update the forecasts, which helps the companies stay ahead and adapt to the changes with timely adjustments in the strategies.

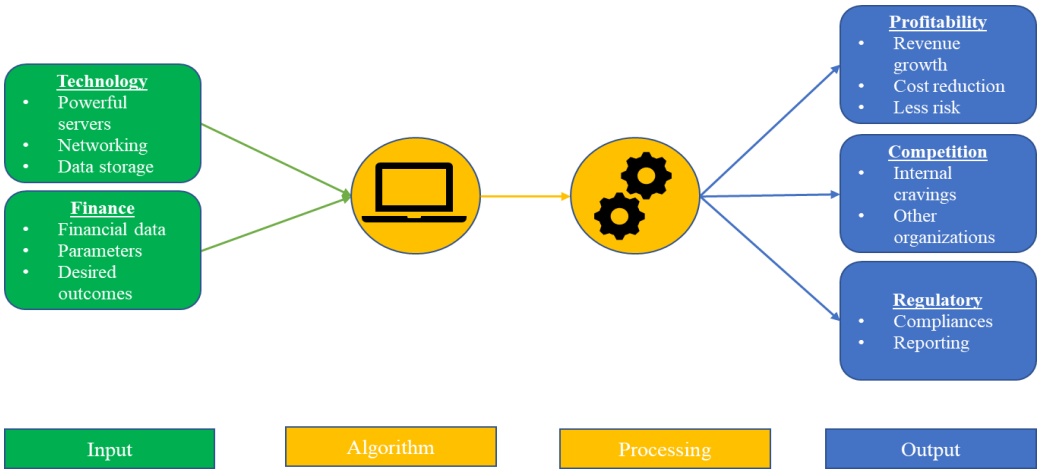

Figure 3. Developing the AI system for FMS

CONCLUSION

The AI application in transmission companies for financial management can offer the opportunity for operational efficiency enhancement and financial resources optimization and provide support for strategic decision-making. AI can be employed for predictive analysis, financial forecasting, risk management and automated financial reporting regulatory compliances. The AI enables the companies to analyze the real time fluctuations in financial markets that can impact directly or indirectly to the company to maintain financial stability. AI can also detect frauds which helps in reducing the risk. The accuracy is comparatively high, and by quickly accessing the database, the on-table issues

can be resolved effectively in the shortest time. However, it requires a successful implementation, which can be accomplished through appropriate planning, employee training, and installation of state-of-the-art equipment. Nevertheless, it is necessary to understand that it is not a short-term project and kind of a recurrent activity that improves with time passes and requires ample financial and human resources to ensure long-term sustainability and financial health. The 5W1H framework supports us in understanding the different aspects and stages of the AI implementation and functionality, along with setting the actions for its efficacious application.

Acknowledgement

This work is funded by the Africa New Energies.

REFERENCES

[1] T. H. Davenport, R. Ronanki, J. Wheaton, and A. Nguyen, "FEATURE ARTIFICIAL INTELLIGENCE FOR THE REAL WORLD 108 HARVARD BUSINESS REVIEW."

[2] S.-L. Wamba-Taguimdje, S. Fosso Wamba, J. R. Kala Kamdjoug, and C. E. Tchatchouang Wanko, "Influence of artificial intelligence (AI) on firm performance: the business value of AI-based transformation projects," Business Process Management Journal, vol. 26, no. 7, pp. 1893–1924, May 2020, doi: 10.1108/BPMJ-10-2019-0411.

[3] D. Yang, T. He, B. Du, S. Wang, Z. Zhang, and S. Zhang, "Transmission Line Planning Based on Artificial Intelligence in Smart Cities," Mobile Information Systems, vol. 2022, pp. 1–8, Mar. 2022, doi: 10.1155/2022/2010189.

[4] Y. Xu et al., "Artificial intelligence: A powerful paradigm for scientific research," The Innovation, vol. 2, no. 4, p. 100179, Nov. 2021, doi: 10.1016/j.xinn.2021.100179.

[5] S. Kumar and R. Sharma, "Applications of AI in Financial System," in Natural Language Processing, IGI Global, 2020, pp. 23–30. doi: 10.4018/978-1-7998-0951-7.ch002.

[6] H. Hu, "Artificial Intelligence Background Corporate Financial Management Transformation Study," Asia Pacific Economic and Management Review, vol. 1, no. 5, pp. 1–8, Sep. 2024, doi: 10.62177/apemr.v1i5.51.

[7] P. Giudici, R. Hochreiter, J. Osterrieder, J. Papenbrock, and P. Schwendner, "Editorial: AI and Financial Technology," Front Artif Intell, vol. 2, Nov. 2019, doi: 10.3389/frai.2019.00025.

[8] S. S. Ali and B. J. Choi, "State-of-the-Art Artificial Intelligence Techniques for Distributed Smart Grids: A Review," Electronics (Basel), vol. 9, no. 6, p. 1030, Jun. 2020, doi: 10.3390/electronics9061030.

[9] N. Bussmann, P. Giudici, D. Marinelli, and J. Papenbrock, "Explainable Machine Learning in Credit Risk Management," Comput Econ, vol. 57, no. 1, pp. 203–216, Jan. 2021, doi: 10.1007/s10614-020-10042-0.

[10] V. Franki, D. Majnarić, and A. Višković, "A Comprehensive Review of Artificial Intelligence (AI) Companies in the Power Sector," Feb. 01, 2023, MDPI. doi: 10.3390/en16031077.

[11] A. Y. A Bani Ahmad et al., "International Journal of INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING Artificial Intelligence Perspective Framework of the Smart Finance and Accounting Management Model." [Online]. Available: www.ijisae.org

[12] Y. K. Dwivedi et al., "Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy," Int J Inf Manage, vol. 57, p. 101994, Apr. 2021, doi: 10.1016/j.ijinfomgt.2019.08.002.

[13] S. Feuerriegel, M. Dolata, and G. Schwabe, "Fair AI," Business & Information Systems Engineering, vol. 62, no. 4, pp. 379–384, Aug. 2020, doi: 10.1007/s12599-020-00650-3.

[14] D. Mhlanga, "Industry 4.0 in Finance: The Impact of Artificial Intelligence (AI) on Digital Financial Inclusion," International Journal of Financial Studies, vol. 8, no. 3, p. 45, Jul. 2020, doi: 10.3390/ijfs8030045.