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Digital Interconnected Intelligent Decision-Making Platform Based on AI Technology

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***Abstract*-In response to the ongoing digital transformation in the oil and gas industry, CNPCNP has developed the "Digital Interconnected Intelligent Decision-Making Platform" to enhance production efficiency, optimize operations, reduce costs, strengthen safety controls, and drive the high-quality development of the company. This platform integrates various AI technologies, including mining technology, business intelligence (BI), robotic process automation (RPA), optical character recognition (OCR), machine learning, low-code development, and AI-generated content (AIGC). By leveraging industrial interconnection, the platform creates a unified database that spans the entire data lifecycle, providing a comprehensive governance and data intelligence system. It effectively connects isolated data silos and enables the creation of advanced intelligent data models with minimal coding through "drag-and-drop" methods. This new approach to digitalization promotes a value framework of "connected by digitalization, driven by digitalization, and reshaped through digitalization." Ultimately, the platform achieves key objectives, including paperless operations across all company processes, online processing of all workflows, automated information transmission, real-time monitoring of all data, interconnected project management and early warning systems, and overall intelligent company management.**

Keywords-Artificial Intelligence (AI); Robotic Processing Automation (RPA); Business Intelligence (BI); Digital Transformation

I. INTRODUCTION

CNPCNP Petroleum S.A. (CNPCNP) is an upstream, midstream and downstream integration project, but its host country, Niger, is one of the least developed countries in the world, with extremely poor economic conditions, serious security situation, backward infrastructure, low education level, and the Agadem oil field is located in the hinterland of the Sahara Desert, with extremely harsh natural conditions and no social support, so the oil field construction and production and operation are facing a lot of challenges.

In the wave of global "digital transformation", BP, ExxonMobil, Shell and other international oil companies have begun to actively explore the application of artificial intelligence technology in the petroleum field. In April 2017, Phil Murray pointed out in the article "Delivering on the Promise of Digital Transformation" in the World Oil magazine that "Today's digital innovation is driving what many say is the fourth industrial revolution (Industry 4.0) ….. advanced technologies, such as the Internet of Things, automation, analytics and artificial intelligence, are reshaping the way that organizations operate". [1]

BP Group CEO Bob Dudley has questioned the lack of progress in the industry by asserting, "we are still so far behind in this area. Much progress remains." Digitization and sensors are playing large roles in BP's operations, especially on upstream platforms, Dudley said, "This will change the way people work."

In the wave of global digital transformation, the use of technology tools such as RPA, automated data collection technology, natural language processing (NLP) and BI combined with business processes can increase productivity, optimize operations, reduce costs, and strengthen safety controls. [2-3]

With RPA, oil companies can significantly enhance their data collection and processing capabilities, ensuring faster and more accurate data handling. RPA enables the automation of data analysis and decision-making processes, leading to improved productivity and reduced operational costs. By streamlining repetitive tasks and eliminating human error, RPA helps companies optimize workflows, allowing for more efficient use of resources and timely, data-driven decisions. [4-5]

Through BI technology, oil companies can collect and integrate data from all aspects, including production data, cost data, sales data, etc., and conduct data mining and analysis to help decision makers better understand business operations. [6-7]

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Oil companies such as Shell, ExxonMobil and BP have their own AI development teams, which utilize machines and AI to handle repetitive, low-value operations, and personnel to handle high-value operations, thus realizing cost reductions and efficiency gains. Among them, Shell organically combines the Shibumi business management method, it introduced with digital staff intelligent robots, automatic data collection technology, business intelligence and other technologies to achieve optimization of organizational efficiency, sharing of information and experience, and promotion of innovation and continuous improvement, which is of greater reference for oil companies to enhance management. [8-10]

CNPCNP is located in the landlocked west-central Africa with a complete industry chain of upstream and downstream integration. It is the largest oil and gas producer in Niger and operates a 1 million-ton crude oil production base, a 462.5-kilometer crude oil pipeline, and a 1 million-ton modern refinery, which has helped the country to establish a complete integrated oil industry chain. At present, CNPCNP has completed the second phase of construction and development, with a new capacity of 4.5 million tons/year and a 1,980-kilometer cross-country pipeline.

CNPCNP is pivotal to the overall economy of Niger. Although its business performance continues to improve, it faces a series of challenges such as changes in the global economic situation, the political situation, the impact of new energy sources, and the demands of resource countries.

II. METHODOLOGY

In the process of continuous development, CNPCNP has encountered a series of challenges, such as the need to further improve work efficiency, the increasing demand for localization in resource country, the high security pressure caused by geopolitical risks, and the inefficiency of communication due to internal information silos.

In the face of challenges and difficulties, CNPCNP, based on extensive research and practical considerations, combined with the most cutting-edge technology, created a solution to help the company's high-quality development. The aim is to improve the company's internal work efficiency through “digital transformation” and process mining optimization, improve the company's decision-making support, reduce data transmission and information communication costs, and reduce the error rate of manual repetitive operations, so as to help the company's high-quality development.

A. Analyze and summarize the difficulties and pain points

- The contradiction between the increasingly strong demand for localization in resource country and the insufficient working ability of local staff in Niger;
- The contradiction between the large amount of information and the single way of information transmission and display;
- The contradiction between the many types of reports and the insufficient number of international employees of the company;
- The contradiction between the many departmental collaborations and communication and the information silos.

B. Solution realization path

Combined with the research results, the preferred option and the set objectives, the “Digital Interconnected Intelligent Decision-Making Platform” is mainly realized through the following measures:

1) Combining cutting-edge AI technologies

By integrating cutting-edge technologies such as process mining, BI, RPA, OCR, machine learning, low-code development, and AIGC, the "Digital Interconnected Intelligent Decision Platform" was quickly established with an X+1+X ecosystem. Through industrial interconnection, it establishes a unified data repository that spans the entire data lifecycle and provides an integrated governance and data intelligence system., connecting siloed data and enabling the creation of limitless intelligent analytical models using minimal code and intuitive "drag-and-drop" methods. This approach generates a new type of digital value—"connected through digitalization, driven by digitalization, and reshaped by digitalization."

2) Leading by example, starting from the procurement business

"Digital Interconnected Intelligent Decision Platform" was first applied in Procurement Bussiness of CNPCNP by reorganizing the procurement management process, upgrading the company's procurement management system, and combining advanced technologies such as RPA, automatic data collection technology, BI, process mining, etc., to realize the goals of paperless procurement procedures, online processing of processes, automation of information transmission, real-time information follow-up, correlation of project management and early warning.

3) Gradual expansion to production, pipeline, refining and other multi-scenario applications

Building on the successful experience in procurement, cutting-edge technologies have been expanded across seven key areas, including Sales Management, Warehouse Management, Production and Transportation Management, Refining and Marketing Management, and Engineering and Construction Management, among others. This expansion aims to comprehensively enhance the company's capabilities in data transmission, data visualization, data analysis, and process automation.

After preparing each business scenario, technologies such as RPA enable seamless interaction between the company's existing systems and platforms in a low-code, cost-efficient manner. This facilitates the linkage of information across various departments, further reducing communication costs, improving the completeness and comprehensiveness of data, and providing an intuitive reflection of the company’s overall business performance. This, in turn, supports and ensures informed, high-level decision-making.

III. RESULTS

A. Intelligent Procurement Dashboard

CNPCNP adopts AI tools to dock the company's procurement management system, and realizes the automated integration, cleaning, analysis and visualization display of procurement data by creating an Intelligent Procurement Dashboard, as shown in Fig. 1.

1) Automated data processing and analysis. The Intelligent Procurement Dashboard utilizes AI tools to achieve automated integration, cleaning, and calibration of multiple data sources, and at the same time, it can analyze and mine the data in multiple dimensions and perspectives, so as to better grasp the business logic and laws behind the acquisition data.

2) Comprehensive data visualization. Better understanding of procurement data, grasp the risks and opportunities in the procurement process, timely warning and adjustment of procurement strategy, optimize the procurement process, improve procurement efficiency and cost control.

3) Data interactivity and real-time. Through simple operation, users can query, filter and sort procurement data in real time according to different dimensions and indicators, and quickly get the required information.

4) Powerful data association. When interacting with a chart, data related to that data point or range in other charts will be automatically highlighted, helping users understand the correlation between data more intuitively and discover the business rules and trends behind the data, as shown in Fig. 2.

In summary, the Intelligent Procurement Dashboard has the advantages of high customizability, comprehensiveness and multi-dimensionality, high interactivity, real-time and dynamics, which can help the company better understand and grasp the data of acquisition management and improve the efficiency and effectiveness of acquisition management.

B. Intelligent Sales Dashboard

The Intelligent Sales Dashboard integrates all the data related to CNPCNP's crude oil sales. Through the Dashboard, it is possible to visualize the international oil price and its changes on a daily, weekly, monthly and yearly basis. CNPCNP's crude oil sales price for the current period, the average price for the year, the price for the same period of the previous year, the average price for the previous year, as well as the average price from the moment CNPCNP started selling to the present. sales began to the current average oil price, as shown in Fig. 3.

In addition to this, the Dashboard shows the achievement of the year's performance indicators by means of a progress display.

The Dashboard captures big data and shows the price of major oil types that have reference value to Niger's crude oil sales price through a line graph, which clearly shows the price of major oil types at the same time, so that the sales staff can check the premium and discount of the major oil types compared to the Brent price in time, in order to set a reasonable CNPCNP's crude oil sales price.

The innovation point of Intelligent Sales Dashboard is that, for the first time, it combines BI, data processing and visualization presentation of sales data, reserving the data interface for AI robot entry and ChatGPT query of real-time prices of major oil types through RPA, which lays the foundation for the subsequent realization of full artificial intelligence in this system.

C. Intelligent Warehouse Dashboard

The Intelligent Warehouse Dashboard realizes automatic tracking and management of items through the use of QR code recognition technology, handheld mobile terminals, mobile apps and cloud-based data storage, thus improving the efficiency and accuracy of warehouse management, as shown in Fig. 4.

1) One Code from Start to Finish

When User submits the procurement requisitions, the procurement staff will assign a 14-digit item code to each item, and this code will be used as the unique “identification” for the whole life cycle management of each material to realize real-time tracking and positioning of the purchased material throughout the entire process and to facilitate the process of acceptance of inbound and outbound warehouse data pulling more conveniently during the process.

2) Intelligent Order Tracking

RPA can automatically grab the price, packing weight, volume size and other necessary information in the invoice box list of the intelligent logistics conveyor system and push it to the logistics tracking management display interface; at the same time, the intelligent robot can log in to the shipping company's webpage to track the ship dynamics according to the grabbed bill of lading number to get the real-time shipment status, which will be maintained by the automatic maintenance to the logistics system.

3) One-click Warehousing

After the goods are shipped, the RPA obtains the document information by email, maintains the information of the actual shipped materials of the batch into the logistics system, and pushes the data of the materials that have actually completed customs clearance to the data platform of the warehouse. After the materials arrive at the on-site warehouse, the warehouse personnel will directly print the pushed data for goods inspection, and after the goods are inspected and accepted, click “Receive All” to realize the “one-click warehousing”.

4) Process Intelligence

In warehouse management, through the use of data warehouse and data mining technology to analyze warehouse data, such as inventory levels, in and out of stock records, etc., to find out the bottlenecks and improvement solutions in warehouse management, and make predictions for the future to better fit the actual production needs of the enterprise.

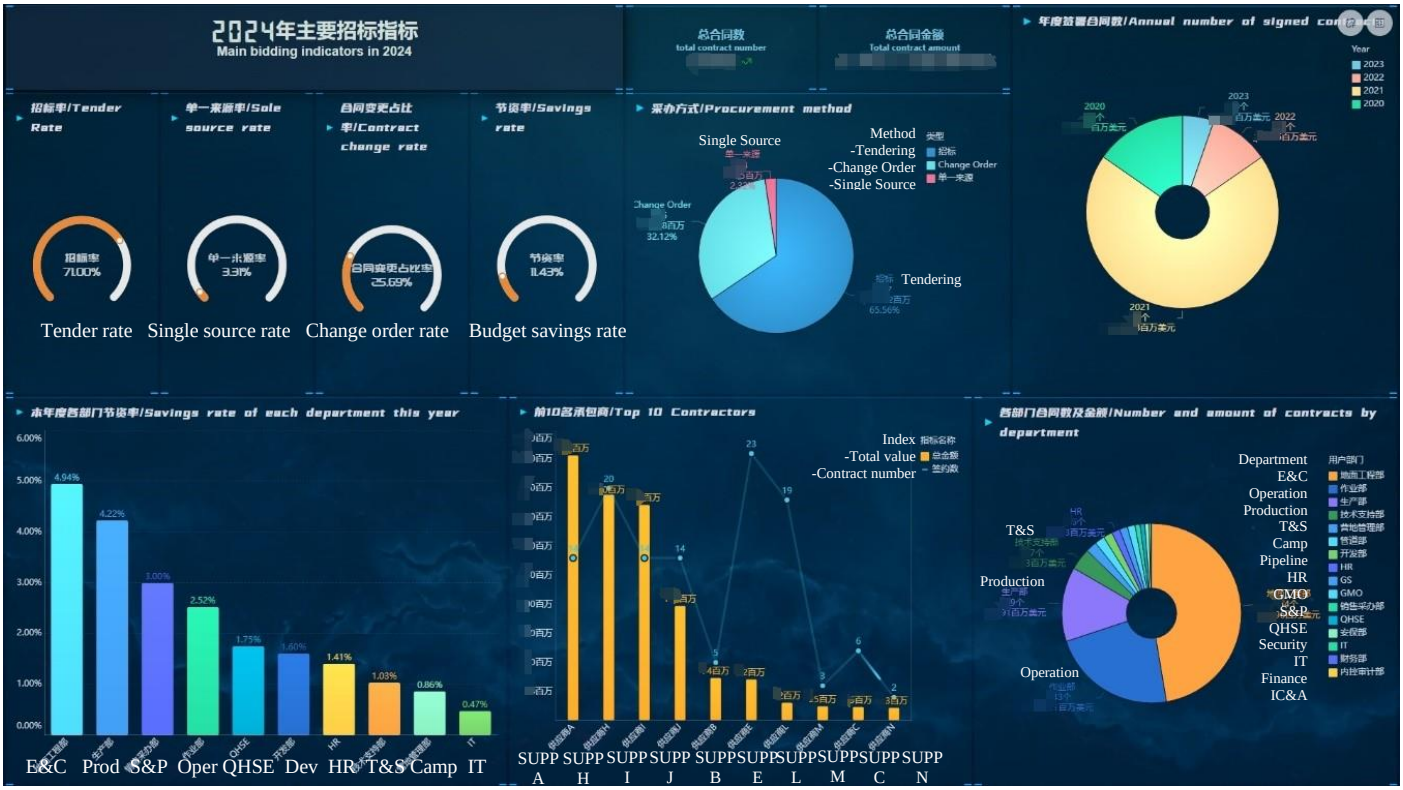

Fig. 1 Intelligent Procurement Dashboard

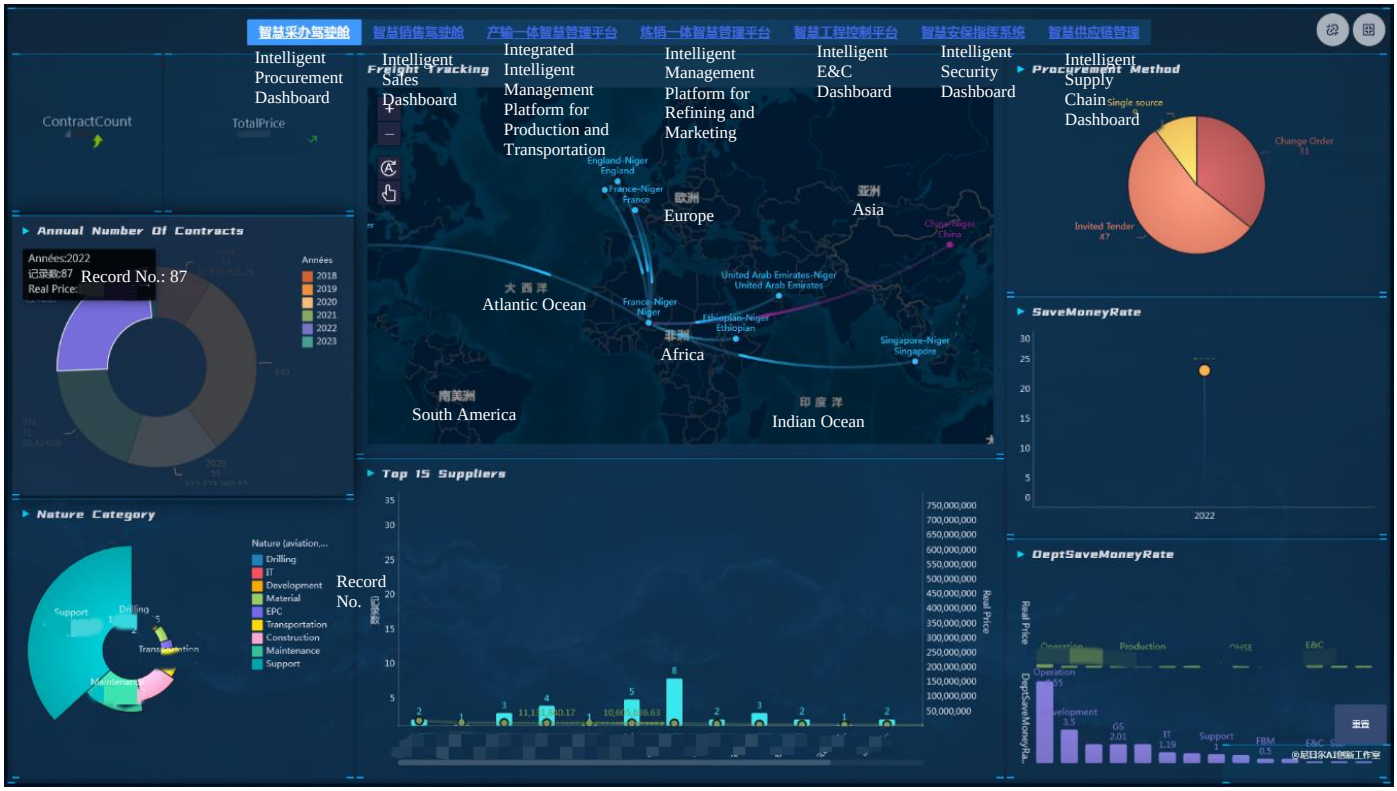

Fig. 2 Data Association of Intelligent Procurement Dashboard

Fig. 3 Intelligent Sales Dashboard

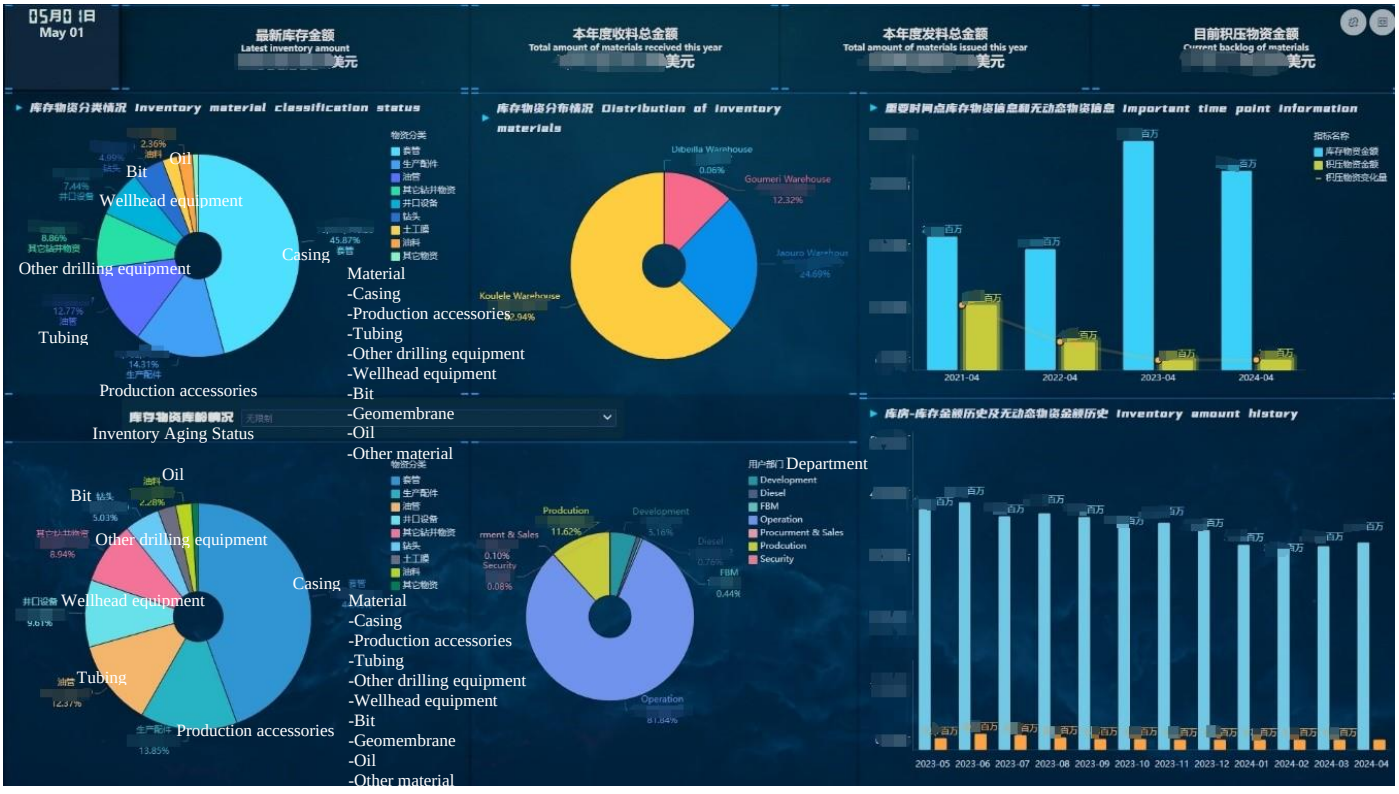

Fig. 4 Intelligent Warehouse Dashboard

a) Improvement of management through the construction of "centralized warehouses" from the face to the point

As shown in Fig. 5, relying on the adjustment of the organization of the warehouse, the newly established central warehouse coordinates resource deployment, breaking the past state of each warehouse working separately, allowing the original relatively fixed manpower and material resources of each warehouse to flow, so that more resources are focused on the demand for the departments and positions to provide services, accelerating the overall speed of the material flow of the warehouse, improving the efficiency of the delivery of the work, shortening the waiting time of the User and reduces the labor cost of the company.

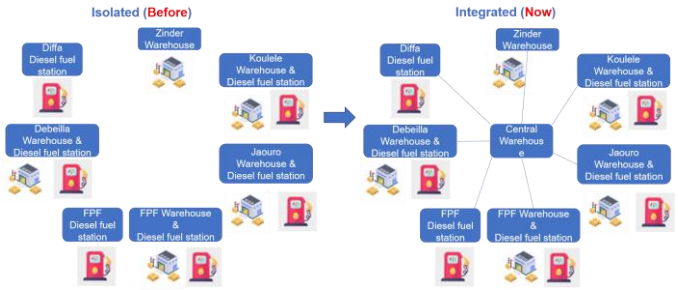

Fig. 5 Process Mining - Center Warehouse from Face to Point

b) Substantial savings in transportation costs through an innovative model of consolidation to sub-transmission

As shown in the Fig. 6, in the past, diesel fuel was supplied to the CNPCNP by large tanker trucks to the Jaouro on site, and then distributed by small tanker trucks to each well site. In this regard, in line with the principle of lean management, diesel fuel management has been optimized, firstly, a diesel fuel supply administrator position has been set up to manage diesel fuel supply in an integrated manner, so that User no longer need to be involved in the supply process; secondly, only the Jaouro is retained as a reserve for emergency diesel fuel, thus releasing more than 300,000 US dollars of funds tied up in the inventory; and lastly, the large tanker trucks are arranged to deliver the diesel fuel directly to the well teams. The innovation of diesel fuel process has effectively realized cost reduction and efficiency, saving $933,400 in diesel fuel transfer costs alone.

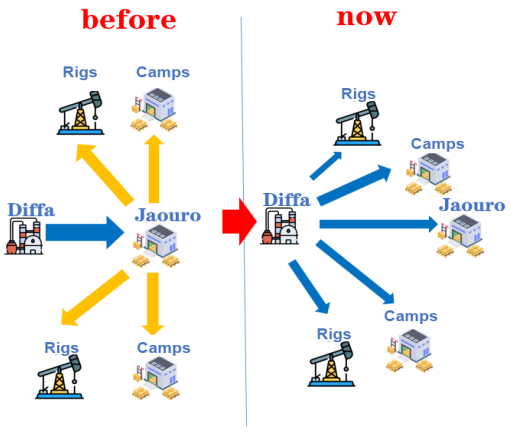

Fig. 6 Process Mining - Diesel Distribution from Point to Face

c) Insisting on excellence and realizing high-quality development of treasury process management

The on-site warehouse adheres to the concept of "less manpower, less inventory, less time, less space", reduces the number of reports while realizing electronic transmission, and at the same time, through the capture and analysis of the data in the electronic reports, it is visually displayed on the intelligent data display screen.

Through data mining combined with lean management combined with the actual formation of diversified solutions, diesel fuel management from point to point, warehouse management from surface to point, "one thing, one policy" constantly digging potential.

D. Integrated Intelligent Management Platform for Production and Transportation

The Integrated Intelligent Management Platform for Production and Transportation leverages advanced data analytics to enhance the accuracy and completeness of data across production, transportation, storage, and quality processes.

The platform enables real-time monitoring and analysis of production data, presenting insights through advanced visualization techniques. Key metrics such as daily, monthly, and yearly oil production are displayed alongside data on the number and types of operational wellheads and their respective proportions within the production department.

Using visualization technology, the platform incorporates alert thresholds to facilitate decision-making. The planned daily pure oil production (orange line) and the daily average of the yearly residual volume (cyan line) serve as alert lines for daily production and annual targets, respectively. Decision-makers can focus on ensuring that critical metrics, such as daily pure oil production (pink line), delivery STB (yellow line), and wellhead production (blue line), remain above these thresholds, as illustrated in Fig. 7.

The Integrated Intelligent Management Platform of Production and Transportation also graphically and intelligently analyzes and displays data in the form of dashboards for different time dimensions of the Pipeline Department's delivery volume, and monitors the temperature difference and pressure of the pipeline in real time.

1) Temperature difference monitoring

Intelligent calculation and processing of soil temperature from the first station to the last station and the temperature of the terminal station finally generates the temperature fluctuation curve of each station. If the curve fluctuation is lower than 3℃ (pink) warning line, the platform can prompt the abnormal site to make a quick judgment and the first time to deal with. As shown in Fig. 8.

2) Pressure monitoring

Set the standard pressure threshold (0.2-9.7), if the pipeline temperature fluctuations in this range at each station means that the pressure at each station is running normally. However, the data of 0.2 at the last station in the above figure indicates that the pressure is already very low. If this data appears at the first

station or the middle station, there will be the risk that crude oil cannot be delivered due to insufficient pressure, and the platform can prompt the abnormal station to make a judgment quickly and deal with it at the first time.

3) Data linkage

For example, if you click on the pressure value of the last station No. 6, it shows 0.2, and at the same time, the temperature difference data shows 11.7, all of which are the data of station No. 6.

The Integrated Intelligent Management Platform of Production and Transportation is an efficient, intelligent, safe and reliable means of oil production and transmission management, which can provide comprehensive management services, optimize the production process, reduce production costs, and realize comprehensive intelligent management.

E. Intelligent Management Platform for Refining and Marketing

The Intelligent Management Platform for Refining and Marketing facilitates intelligent data management by integrating internal data and leveraging advanced technologies such as big data analytics and artificial intelligence. This platform enables real-time monitoring and analysis of production process data. Using data visualization technologies, it provides a comprehensive visual representation of key refinery metrics, including the daily crude oil input at the end station, daily atmospheric pressure crude oil output, and the daily, monthly, and yearly net output of diesel fuel, gasoline, and liquefied petroleum gas. Furthermore, it consolidates data on the daily, monthly, and yearly ex-factory volumes and growth trends for these products. The platform also systematically organizes the refinery's production data, tracks growth trends in ex-factory volumes, and oversees inventory management and sales data, ensuring efficient and informed decision-making, as shown in Fig. 9.

The Platform can improve the company's management level in the following aspects:

- Real-time monitoring and analysis of refinery production data allow for the identification of issues in the production process, enabling timely adjustments to enhance production efficiency and improve product quality;
- Real-time tracking of key indicators to help the company's operations and decision-making.

Refining volume: real-time follow-up of production;

Sales volume: real-time follow-up of revenue;

Inventory: dynamically notify upstream projects of delivery and production;

Gasoline and diesel oil sales ratio: to see changes in market demand and dynamically adjust the device.

- Real-time monitoring and analysis of market dynamics enable timely adjustments to production plans, improving market responsiveness and strengthening the company's competitive position.

F. Intelligent E&C Dashboard

Engineering and Construction (E&C) represent the largest investment component in CNPCNP's upstream projects, encompassing a substantial number of contracts and contractors. These factors pose significant challenges to CNPCNP's ground engineering personnel in terms of contract management, payment management, and project progress oversight. To address these challenges, CNPCNP has introduced the concept of an Intelligent E&C Dashboard, as illustrated in Fig. 10.

The Intelligent E&C Dashboard consolidates all contract-related information for Phase II E&C projects currently underway. This includes data on contract amounts, payment progress, project milestones, and schedules. The dashboard provides dynamic, real-time management by integrating the management requirements of four key dimensions: contract validity, contract amounts, payment progress, and actual project progress. These dimensions are interrelated, mutually supportive, and cross-verified to ensure coherence.

By focusing on key data, managers can effectively control these four dimensions for each project, significantly enhancing management efficiency. Additionally, the dashboard allows for the seamless linking of project-specific data. By clicking on a project name, users can access all relevant information pertaining to that project.

The Intelligent E&C Dashboard addresses critical project management challenges by providing clear and actionable insights through data visualization. This not only offers a transparent view of each project's specific progress but also helps project managers identify and rectify deficiencies promptly, thereby promoting the smooth and efficient execution of all projects.

G. Intelligent Audit System

Traditional auditing faces significant challenges when processing large volumes of data. To address these issues, CNPCNP has introduced an innovative digital solution that enhances data sharing and the utilization of analytical models. This solution integrates the mature auditing framework of the CNPC Overseas Audit Center with CNPCNP's digital management tools, achieving a high level of synergy between the auditing business model and advanced digital technologies such as RPA, BI, and Elasticsearch.

This integration significantly enhances the comprehensive utilization of data, bolsters the ability to leverage information technology for verification, evaluation, judgment, and macro-level analysis, and optimizes the functionality and efficiency of the auditing model across multiple dimensions, as illustrated in Fig. 11.

Firstly, automation technologies and data analysis tools have significantly enhanced the efficiency and accuracy of data processing. Auditors no longer need to spend extensive time manually organizing data; instead, automation enables efficient data cleaning and integration, saving substantial time and effort.

Secondly, the use of data visualization and statistical analysis facilitates comprehensive monitoring and evaluation of procurement activities, strengthening the analysis and

utilization of data resources. Auditors can leverage charts, reports, and other visual formats to assess procurement operations, promptly identify anomalies and issues, and provide valuable insights to inform CNPCNP's management decisions.

Furthermore, the transformation and sharing of audit results eliminate information silos between departments, fostering information exchange and improving the overall efficiency and quality of audit work.

The main interface of the model displays key information related to procurement and bidding activities through dynamic data and visual elements. It allows for data slicing and inter-panel correlations, offering higher data value alongside more comprehensive, timely, and accurate data representation. Additionally, the model generates paperless electronic data with convenient storage and robust sharing capabilities.

Fig. 7 Integrated Intelligent Management Platform for Production and Transportation

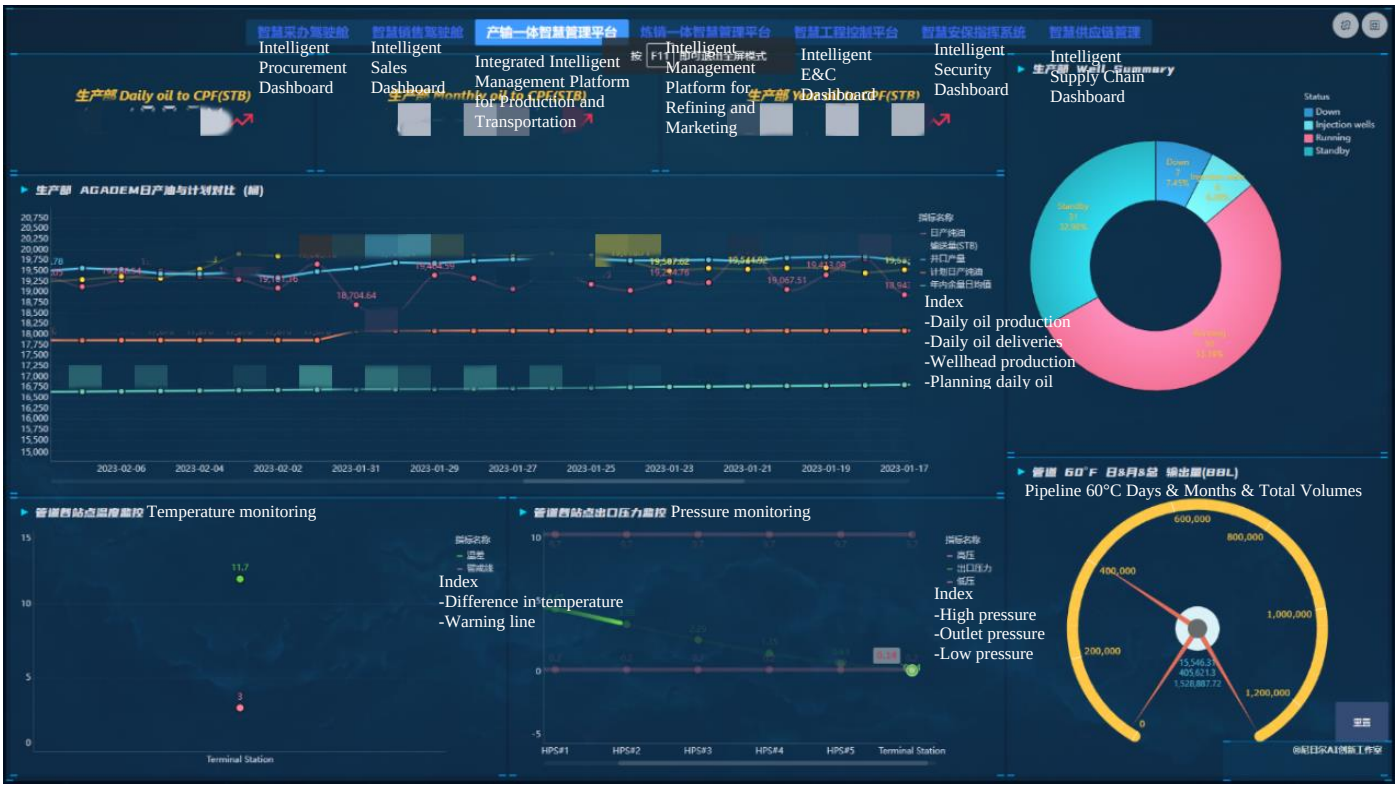

Fig. 8 Real-time display of pressure and temperature difference

Fig. 9 Intelligent Management Platform for Refining and Marketing

Fig. 10 Intelligent E&C Dashboard

Fig. 11 Intelligent Audit System

IV. APPLICATION EFFECTS

Through the gradual landing and implementation of the Intelligent Decision-Making Platform, the overall production efficiency of CNPCNP has been greatly improved, all costs have been further reduced, and the speed of information transmission has been significantly strengthened, which provides a great boost to the company's high-quality development and digital transformation. According to the estimation, it is expected to create economic benefits of 48.35 million dollars, of which:

A. Significant reduction in labor costs, generating benefits of $37.595 million

Currently, 10 RPAs are deployed to cover the workload of approximately 15 local and 6 international staff per day; BI saves a significant amount of labor costs for international staff to produce reports and external reports, covering the workload of approximately 5 international staff per day. At a cost of USD 50 per local employee per day and USD 400 per international employee per day, and with the system running for 20 years, the benefits created are as follows:

Labor cost saving (USD) = (15*50+11*400)*365*20 = USD37,595,000.00

RPAs and BI saves workload as shown in Table 1:

TABLE I. WORKLOAD SAVINGS STATISTICS

Estimated Manpower Savings from RPA				
S/N	Department/Business	Name of RPA	Replacement of local staff workload	Replacement of international staff workload
1	Production Dept.	Production AI Assistant	1	0.5
2	Pipeline Operation Dept.	Pipeline AI Assistant	2	0.5
3	Finance Dept.	Finance AI Assistant	3	1
4	Sales	Sales AI Assistant	0	0.5
5	Procurement	Procurement AI Assistant	1	1
6	Security Dept.	Security AI Assistant	1	0.5
7	Logistics	Logistics AI Assistant	1	0.5
8	Warehouse	Warehouse AI Assistant	3	0.5
9	E&C Dept.	E&C AI Assistant	1	0.5
10	Refinery	Refinery AI Assistant	2	0.5
Subtotal			15	6
Estimated Manpower Savings from BI				
S/N	Report Name	Qty	Replacement of local staff workload	Replacement of international staff workload
1	OGI	30	0	0.5
2	Sales	5	0	0.3
3	Procurement	6	0	0.5
4	Warehouse	4	0	0.2
5	Production and transportation	4	0	0.5
6	Refining and marketing	4	0	0.5
7	Engineering management	6	0	0.5
8	Security	4	0	0.5
9	Supply Chain	2	0	0.5
10	Overall report	10	0	1
Subtotal			0	5
Total			15	11

B. Savings in other system development costs, resulting in benefits of $2 million

The low-code nature of the Intelligent Platform saves development costs by interconnecting systems and avoiding duplication of development of other systems.

Previously, the Government of the Niger had commissioned an external consulting firm to develop a reporting system that cost $600,000 to develop and $70,000 per year to maintain, for a total of $2 million over the 20-year contract period.

C. Addressing data silos, creating benefits of $8.76 million

Data interaction and sharing between systems realized through the low-code development of digital employee intelligent robots is low-cost and highly efficient, and is expected to save the communication and exchange costs of 3 international employees per day, which creates the following benefits according to the daily cost of each international employee of USD 400 and 20 years of system operation:

Labor cost saving (USD) = 3*400*365*20 = USD 8,760,000.00.

CNPCNP previously had no communication between the various systems, resulting in a series of problems such as duplicate data entry, difficulty in reflecting the entire business chain in the data, and a great deal of energy spent on data reconciliation.

CNPCNP realized data sharing through RPA technology and low-code development, which solved a series of problems such as repeated data entry, high communication costs and one-sided business presentation.

D. Dramatic increase in productivity

The instantaneous transmission of data and the intelligent processing of the system drastically shorten the time it takes for data to be transformed into valuable information for decision-making and early warning, improving the company's overall production efficiency.

As shown in the Fig. 12, the company's various production processes and business processes have seen a 75%-95% increase in efficiency, greatly contributing to the company's overall operational efficiency.

E. Effective prevention of risks

The use of Intelligent Decision-Making Platform improves the data transmission rate and accelerates the response speed of various safety, production, business and planning early warning systems, which can realize “prevention is better than cure”, and remind the management to take timely measures when risky events and accidents appear in the early stage, so as to prevent accidents from occurring in the cradle.

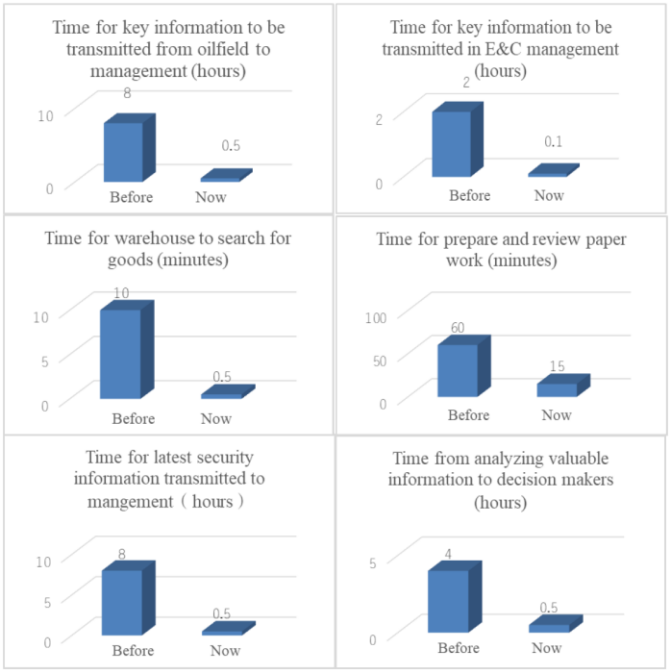

Fig. 12 Dramatic increase in productivity

V. Conclusions

The gradual deployment and implementation of the Digital Interconnected Intelligent Decision-Making Platform has delivered significant management and economic benefits to the company.

1)Breaking Data Silos through Information Interconnection: Further reduce communication costs and enhance the integrity and comprehensiveness of data.

2)Replacing Repetitive Labor with Digital Employees: Digital Employees (RPA) can handle repetitive, low-value tasks, addressing issues such as the generally low education levels of local employees and their susceptibility to errors. This frees up employee time, allowing them to focus on more meaningful tasks and significantly boosts the company's overall productivity.

3)Assisting High-Level Decision-Making through Business Intelligence: The unified intelligent management dashboard visually reflects the company's overall operational status, providing support and assurance for senior decision-makers. It reduces the time spent in ineffective meetings and extensive data analysis, allowing the general manager to make strategic decisions from their office, managing operations from a distance.

1) Achieving Information Value Enhancement through AIGC and Data Mining: By utilizing AIGC and data mining, digital employees collaborate effectively, enabling conversational queries of company policy documents. Simultaneously, potential risks in the company's operations and audits are identified, allowing for proactive risk prevention, ensuring that the value of data shines like gold.

These aspects collectively contribute to the ultimate goal of achieving full paperless operations across all business processes, comprehensive online handling of workflows, fully automated information transmission, real-time information tracking, comprehensive project management and early warning systems, and the overall intelligent management of the company.

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