Integrated Support Systems

Enterprise Resource Planning System (ERP)

The Enterprise Resource Planning (ERP) system is powered by advanced management concepts and deeply integrated with ISO standardized management systems, establishing a modern operational framework that achieves efficient management with minimal investment. The system inherits the essence of classic management concepts such as JIT and TQC, forming an integrated management paradigm that covers all scenarios in the manufacturing industry.

Vertically, it spans the entire business chain, including sales, production, procurement, warehousing, finance, quality control, and outsourcing, achieving end-to-end integration of business processes. Horizontally, it breaks down departmental barriers, enabling high-level integration and seamless sharing of information resources while retaining the flexible and independent application characteristics of each functional module.

By driving the synergistic interaction of business processes and cash flows through data flows, the system provides real-time visibility into the entire operational landscape, enabling precise decision-making. It meets standardized management requirements while adapting to enterprise-specific needs, creating a management ecosystem that balances standardization and flexibility. This effectively enhances resource allocation efficiency and operational responsiveness, driving a systematic leap in management effectiveness.

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Digital Twin System

Build a full-dimensional digital twin 3D visualization module to achieve millimeter-level precision visualization and control of production line environments and facilities and equipment. Relying on digital twin technology, build a 3D visualization equipment information display system to accurately map all equipment element data in a three-dimensional presentation. The module supports real-time data-driven 3D dynamic rendering and features multi-dimensional interactive functions, including model rotation, scaling, precise positioning, and dynamic state coloring. It seamlessly integrates real-time production data and equipment operation information from the site. Through a visualization management paradigm that blends virtual and real elements, it achieves comprehensive perception and dynamic monitoring of production scenarios, providing intuitive and precise decision-making support for efficient production line operations.

Achieve online scheduling visualization supervision: By connecting to the data center to obtain equipment basic information and real-time data, and leveraging digital twin technology to build a 3D visualization platform for production lines, the system enables centralized display of data results and real-time monitoring, viewing, and querying of equipment information and operational data. This initiative drives the transformation of management models toward "proactive" and "visualized" approaches, enabling precise and efficient issue identification, comprehensively enhancing equipment management service levels, and ensuring stable equipment operation.

Achieve visualization of production line monitoring and alarm information display: By associating equipment and facility data with time, space, and geographical location, the system achieves deep integration between data analysis and real-world scenarios through "transforming data into physical objects." The system projects real-world production scenarios into a digital space, dynamically displays the actual operational status of equipment and facilities after 3D visualization reconstruction, and presents data in a more intuitive and tangible manner.
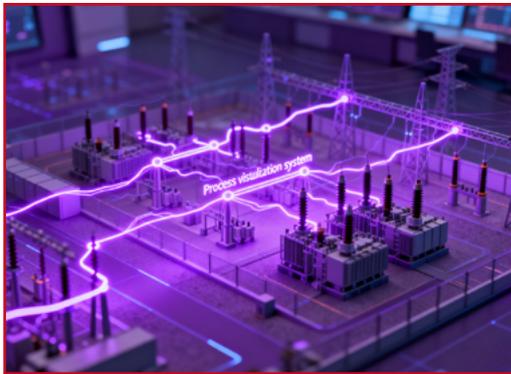
Process Visualization System

The system integrates interactive 3D simulation modeling technology with a precise process query and positioning system to build an efficient process transmission and skill empowerment platform. Relying on high-fidelity 3D simulation modeling technology, it achieves multi-angle dynamic presentation and interactive operation of product process, breaking through the technical bottlenecks of traditional process videos with fixed angles and lack of interactivity, making process details perceptible and explorable.

The system is also equipped with an intelligent process search engine, which uses precise query and location technology to enable second-level search and targeted retrieval of process nodes. Operators can access any process procedures within their authorized scope at any time, leveraging the system to efficiently master the corresponding operational skills. The synergistic application of these two technologies not only optimizes the intuitiveness and flexibility of process transmission but also enhances the precision and efficiency of skill learning, providing comprehensive technical support for the implementation of standardized operations and the enhancement of personnel capabilities.

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3D Virtual Training Platform

The system provides interactive operational guidance, enabling staff to conduct practical exercises using virtual models. The system provides real-time feedback on the correctness of operations and offers targeted guidance and corrective suggestions. It also supports precise simulation of operational processes for different models and specifications of components, meeting the needs of diverse production scenarios.

Training content is presented in a multi-modal format, integrating high-definition video tutorials, interactive dynamic courseware, and immersive virtual demonstrations to precisely align with the needs of different learning styles. Based on the job characteristics and skill levels of trainees, the system constructs differentiated training modules and a tiered difficulty system to achieve intelligent matching of customized learning paths. The system includes built-in training progress tracking and scientific assessment mechanisms to record learning trajectories and knowledge mastery in real time.

Visual Maintenance Platform

The visual maintenance platform builds a comprehensive maintenance guidance system, providing detailed support for the entire equipment maintenance process. The system uses 3D animation and step-by-step breakdown technology to convert key maintenance processes such as fault diagnosis, tool selection standards, and parts assembly and disassembly steps into intuitive and dynamic demonstrations, providing maintenance personnel with precise operational guidance.

Leveraging high-fidelity fault simulation capabilities, the system replicates various equipment fault phenomena and their causes, creating a virtual diagnostic training environment to enhance maintenance personnel's accuracy in fault analysis. The innovative virtual maintenance training module enables hands-on training on digital models, enhancing proficiency and efficiency across all maintenance processes. Additionally, it integrates a maintenance knowledge management hub, enabling convenient access to maintenance manuals, historical records, and other documents in a virtual environment. This promotes the dynamic accumulation and continuous iteration of maintenance experience, providing comprehensive support for upgrading equipment maintenance capabilities.

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Environmental Management System

The system's infrastructure modules include: a legal and regulatory standards database, an environmental factors and risk database, permit and compliance management, target and indicator management, monitoring data management, hazardous chemical management, energy and resource management, environmental protection facility operation management, emergency management, other management functions, and data analysis and reporting.

The system is built on a cutting-edge technical architecture, fully compliant with current mainstream technical standards. Through standardized interface design, it reserves ample expansion space, enabling smooth scalability during subsequent application enhancements and supporting standardized integration with multiple systems. The mobile app enhances daily management scenarios, achieving convenient and mobile business processing.

Through the construction of the environmental management system, pollution source data is fully integrated and presented in a comprehensive manner, establishing a multi-dimensional information insight system for decision-makers. Through this system, managers can not only obtain real-time macro and micro information on enterprise safety production, achieving dynamic control of all elements of information, but also deeply penetrate the operational status of various internal work processes within the unit, accurately capturing key nodes in the management process. This dual empowerment of comprehensive data coverage and precise information push provides decision-makers with comprehensive, timely, and dynamic decision-making basis, supporting the scientific and forward-looking nature of management decisions.

Safety Management System

The system's infrastructure modules include: system technology application platform, safety objective management, hazard identification management, safety training management, safety operation management, safety system document management, safety emergency management, safety hazard source management, safety equipment and facility management, occupational health management, safety risk management, safety organization management, safety accident management, mobile app, safety information analysis and display, and other application module functions.

The system presents key safety indicators through data visualization dashboards, assisting management in making precise decisions, comprehensively enhancing the predictability and standardization of enterprise safety management, and enabling real-time monitoring of safety management dynamics. By leveraging data insights, it promptly identifies safety weaknesses in production processes, rapidly formulates optimization strategies, and continuously drives the iteration and improvement of safety management systems while ensuring the safe operation of production.

Through the construction of the safety management system, the enterprise achieves full-cycle tracking of safety issue identification, rectification, and verification, strengthens emergency response capabilities, and realizes the digitization of personnel safety management.

Integrated Support Systems

Quality Management System

The main components of the quality management system include: Quality System Management Submodule, Quality Cost Management Submodule, Quality Improvement Management Submodule, Quality Information Form Management Submodule, Non-conformance Form Management Submodule, Comprehensive Quality Management Submodule, Supplier Quality Management Submodule, Measurement System Submodule, Manufacturing Process Submodule, After-sales Management Submodule, and other ten submodules.

The system integrates data and information from all stages of the process, including design, manufacturing, procurement, maintenance, commissioning, and after-sales service, providing robust support for both forward and backward quality traceability. By integrating critical data such as failure modes, non-conformance information in manufacturing and maintenance, commissioning anomalies, and after-sales faults, the system leverages a hierarchical and categorized closed-loop management mechanism to establish knowledge accumulation, continuously enhancing risk management capabilities. Through functions such as closed-loop resolution of specific issues, issue statistics and trend analysis, and dynamic monitoring of quality management indicators, the system achieves data-driven product quality improvement, thereby realizing the goal of electronic and data-driven management of the entire quality process within the enterprise.

AI-Based Big Data Analysis Decision-making System

Multi-source data collection and processing: Supports the construction of multi-source data resource pools, supports automatic classification and cataloging management of multi-source data, supports the establishment of multi-source entity data, supports multi-modal fusion of multi-source data, supports spatio-temporal visualization of multi-source data, and possesses multi-source data analysis capabilities;

Intelligent Entity Model Construction: Utilizes intelligent data processing technology to construct entity models through various methods. Capable of automatically identifying entity objects, with the ability to automatically or manually construct entity data models, and supports structured conversion of data models, providing multiple data formats.

Data Entity Intelligent Applications: Utilizes large-scale models and natural language technology to structurally organize entity object data based on entity data models. Possesses automatic extraction capabilities for data attributes, provides process management for entity data organization, quality verification, data service publication, and spatial visualization capabilities (such as data analysis and decision-making, prediction; natural language interaction, fault analysis, and diagnosis, etc.).

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Production Integrated Management System

he system was built in strict accordance with digital production workshop construction standards, with the core objective of achieving production-centric information flow and resource control throughout the entire process. It covers key functions such as master data management, basic data management, planning management, inventory management, barcode management, manufacturing execution systems, quality management, equipment management, tooling management, and data collection.

It significantly enhances the comprehensive control capabilities of the production workshop, enabling enterprises to complete production preparations ahead of schedule according to production plans, scientifically allocate production resources, improve product quality pass rates, achieve synchronized and efficient sharing of information flow and logistics, and ensure timely product delivery to enhance customer satisfaction. Ultimately, it aims to improve production management levels, eliminate waste, and meet the development needs of production workshops for quality improvement, cost reduction, and efficiency enhancement.