Research and implementation on integration information platform in China tobacco industry enterprise

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Abstract

For better information technology combined with enterprise management mechanism to solve the information technology into the enterprise production and operation of each link, the integration of information platform for building modern tobacco industry enterprise is proposed. First of all, this study combines the principal business process for building market-driven enterprise, and proposes based on self-assembled dynamic fifth-order business model for enterprise business operation model. According to the actual situation of enterprise information system construction, the integration information platform application architecture and integration architecture designs is developed. This information platform uses SAP XI as the ESB transforms the formats of all data coming from source systems to realize the seamless integration among different systems. With this integration information platform construction it can better support enterprise development strategies, optimizing resource allocation, improve business and management efficiency, and promote scientific enterprise sustainable development.

Keywords: tobacco industry enterprise, business process model, integration information platform

1 Introduction

As the China tobacco industry continues to promote market-oriented reforms, re-quires the tobacco industry enterprises to improve the ability of adapting to the market, to advance the tobacco industry continues to upgrade and promote the tobacco industry sustained, stable and coordinated and healthy development. At the present, how to promote market-oriented business transformation, improve the integration of management and control capability, and improve operational efficiency, follow-up industry development strategic planning and strategy, to cope with more open and more intense market competition, become the important challenges facing tobacco industrial enterprise.

At present the domestic tobacco industry enterprises to innovative development model, combining information technology and management and system mechanism innovation, to deepen the depth of industrialization and information technology integration, Focus on information technology transformation and using information technology into research and development, manufacture, marketing, procurement and other aspects. Promoting industry transformation and upgrading of industry, and build the modern tobacco industry enterprise.

The final aim is to adhere to the market demand as the leading factor, market orientation reform practice and management model innovation, to construct integrated information platform meet the research and development, manufacture, marketing, procurement and other business, which to support enterprise development strategies, optimizing resource allocation, improve business and management efficiency, and promote scientific enterprise sustainable development.

2 The Information platform current situation in tobacco industry enterprise

Nowadays, the research and application of integration information platform meet the enterprise business model has been the focus of manufacturing industry informatization in home and abroad enterprises. Since the main features that reflect the supply chain-oriented operation mode, management processes, business practices and refining, support changing business models and business models continuous improvement, etc.

Domestic tobacco industry enterprise information platform research direction and trend mainly reflected in the following aspects:

1) Management ideas and technology to further blend in epitaxial aspects: On the basis of enterprise resource planning management thinking, continue to absorb the latest advanced management ideas or patterns, such as agile manufacturing, lean production, concurrent engineering, total quality management and agile virtual enterprise organization and management model, based on e-commerce enterprise collaborative management model, and cross-enterprise collaborative project management model, combines the management ideas and business processing model.
2) Integration information platform capabilities continue to expand in connotation aspects: The increasingly

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fierce market competition requires enterprises to dynamically ad-just timely and transformation. There are two main trends of the development, on the one hand, the introduction of Dynamic Enterprise Modelling (DEM), which means to introduction business process continuous improvement as the goal of dynamic information system in support of Internet/Intranet technical environment. On the other hand, the Intelligent Resource Planning (IRP) breaking the previous all those "transaction processing-oriented" management model, help managers followed even ahead of market changes quickly make the right decisions, changed the original plan, and fastest implementation of these changes to solve previously unsolvable "collaborative manufacturing" and "resource constraints" and other issues.

3) Integration information platform for the transition to the intelligent information processing: Integration information platform for business intelligence features include intelligent filtering and processing capabilities, program optimization, intelligent data analysis, etc. Integrated data warehousing, data mining and online analytical processing (OLAP), business intelligence, decision will support to strengthen enterprise knowledge management capabilities. Constitute a set of integrated query, reporting as the intelligent decision-making information systems to help business managers to find a best solution for macro decision-making and business strategies, and improving the resilience of the market and on-site management capabilities.
4) Integration information platform combined with Internet business model, mobile terminals and other cutting-edge technology: Internet-based integration information platform will incorporate the latest Internet technologies and business management concepts in the browser/server structure, make the enterprise marketing management, logistics network across the enterprise management, product lifecycle management, and decision support system extended to computers, terminals, mobile phones, PAD and other new types of end products. To realization of the front office, business intelligence, electronic commerce, office automation system and the integration of supply chain management applications.

3 Tobacco industry enterprise business analysis

3.1 KEY BUSINESS PROCESSES

Enterprise constructed market driven management model based on market-oriented, means from market to market in the operation of the process. Its contents are demand forecasting as the leader, production planning, raw materials preparation plan, quality inspection plan, marketing plan coordination linkage, sensitive reflect changes dynamically adjust promptly to ensure the most timely reflect market demand and market supply to the maximum extent satisfied.

Mainly is implemented based on the market, manufacturing, procurement, technology research and development as four centres, key business processes can be summarized as "Five Rolling", respectively are Rolling Forecasts, Rolling Production, Rolling Supply, Rolling Maintenance and Rolling Service.

According to market-driven enterprise management mode, business status, departments, functions characteristics, as well as information on the role of operations management, aiming at process performance, combing involves the whole business process of the operation of the enterprise management system to form a new process (see Figure 1).

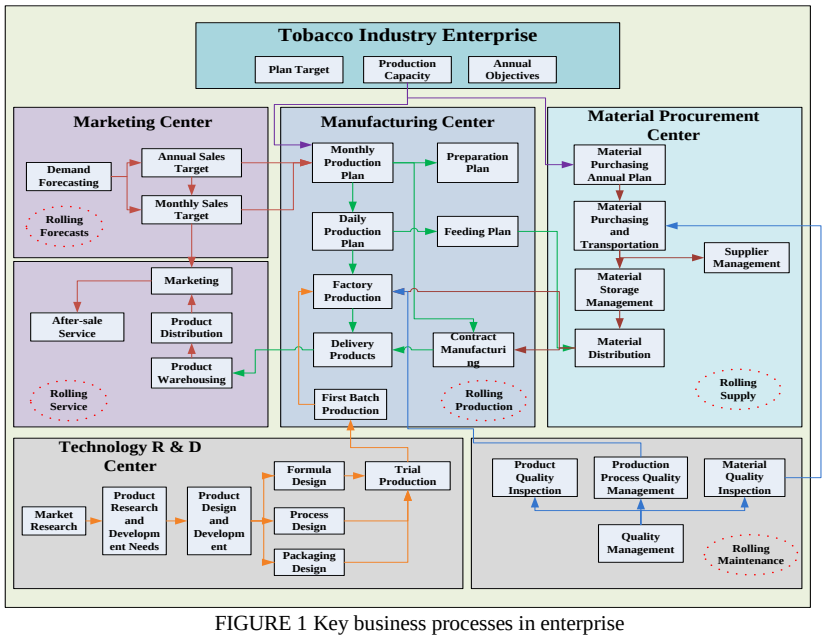

FIGURE 1 Key business processes in enterprise

According to business processes, induction, to extract the enterprise's core business and management support of five vertical and five horizontal ten main line (see Figure 2).

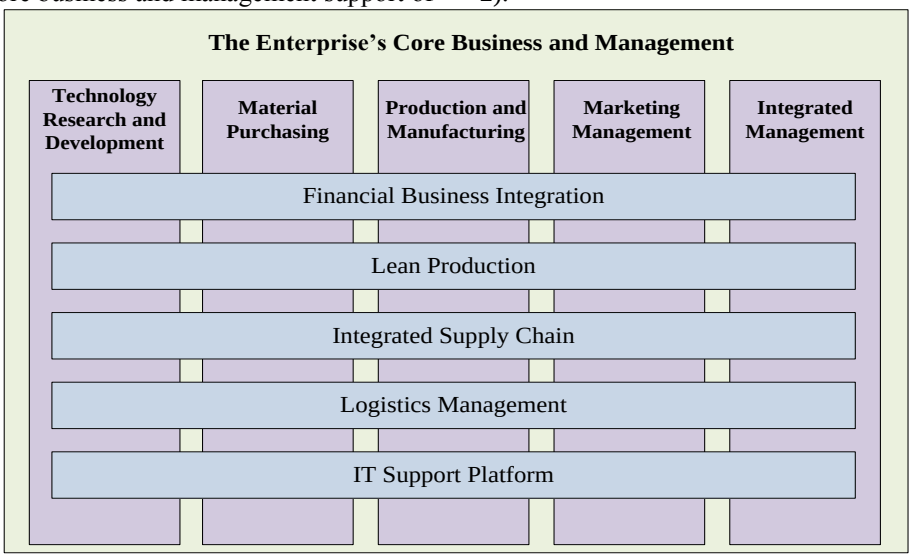

FIGURE 2 The enterprise's core business and management support

3.2 TOBACCO INDUSTRY MARKET-DRIVEN ENTERPRISE INTEGRATION MODE OF OPERATION

Enterprises based on market-driven business model and management features, build a unified organizational structure and improve adapt to the market, in response to the market's ability to supply chain operations. By building the Self-Assembled Dynamic fifth-order business model, inherent characteristics of the tobacco industry's supply chain operation mode, better achieved in the monopoly planning system, flexible organization, dynamically adaptive market demand, and achieved the balance between the company's production and supply coordination.

With the continuous development of information technology and the improvement of supply chain theory, the game between enterprises became the game between supply chain and the supply chain enterprises. How to create an efficient, integrated supply chain system become the key to the success of enterprise.

Enterprises to achieve planning, production, supply, service, maintenance, and other key aspects of the integration of the supply chain work together, across the various business links and nodes in the network and resources the effective aggregation, it can adapt to the changing requirements of supply chain operation. On this basis, we built the five order type and the dynamic network model in conformity with the characteristic. The model is divided into three layers (see Figure 3).

The first layer is a dynamic five-order management system. Respectively, from project management, production management, supply management, maintenance management, service management, and other aspects of the dynamic five-stage system for the overall program, dynamic coordination, operation and optimization.

The second layer is the business network. The business network automatically according to certain rules and gather resources within the network nodes, while providing resource sharing across organizational capabilities and the ability of transparent access to resources. It will contribute to the overall operation of enterprise management solutions, such as supply network planning, coordination problems and some practical applications. Model every aspect of a business involved both as a self-governing region, extraterritorial autonomy exists between the ministries of collaborative relationships between its internal collaborative relationships also exist.

The third layer is the introduction of the supply chain lifecycle management. From the core of supply chain strategy perspective, until the dynamic five-order system of the whole process of construction, operation and continuous improvement, it will reduce duplication and redundancy; standardize work processes, efficient use of resources for the node enterprises to reduce operating costs, reducing operational risk.

The three layer architecture of Self-Assembled Dynamic fifth-order model to better overall management of the company's business characteristics and requirements of a broad and concise, inherent characteristics of the tobacco industry to build the supply chain operations and management and control model. To design and implement integrated information platform to provide a clear demand-oriented and construction requirements. Simultaneously, promote innovation and technological innovation business management joint development and promote the formation of a unique competitive advantage of enterprises.

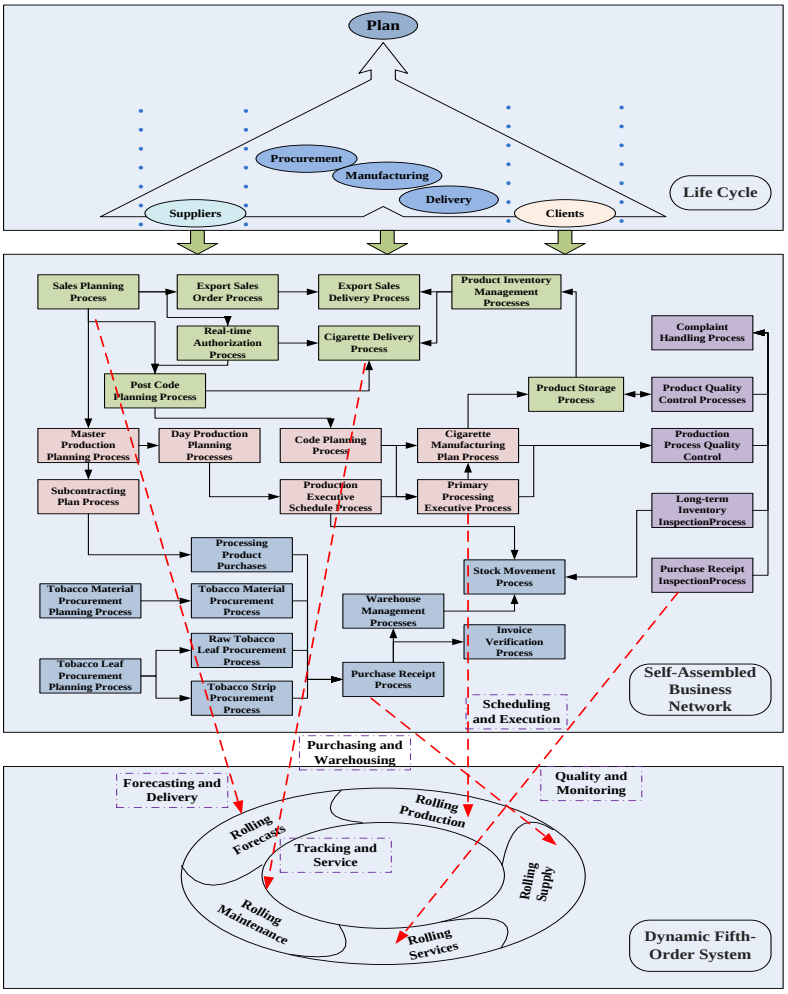

FIGURE 3 The self-assembled dynamic fifth-order business model

3.3 SUPPLY CHAIN MODEL BASED ON PUSH-PULL TYPE BUSINESS PROCESS

The meaning of the business process management is the business process can be automatic control and processing, make the enterprise to realize the automatic operation and management. It makes the enterprise can according to the actual situation of change and the demand of the market, to adjust the business process, improve the flexibility of enterprise business process. Business process management (BPM) provides a broad range of facilities to enact and manage operational business processes. Increasingly, more and more organizations use BPM techniques and tools to promote business effectiveness and efficiency [1, 2]. BPM Not only covers the traditional "Work flow" of the processes to pass, process monitoring the scope of, usually in order to Internet way to achieve information transmission, data synchronization, the business monitoring, and enterprise business processes' continued to upgrade optimization of, breaking the traditional "Work Flow" technology the bottleneck.

Business process models are abstract representations of business process, also is the abstract representation of the business process. Push-pull business process models from the establishment of the purposes is to achieve business process automation, the model includes not only the required number of discrete activities and their interconnected relationships, also define many other information, such as organizations, resources, data, roles, and relationships of these elements describe rules. Description of the activities and routing is the main content of the business process model, the process can be broken down to atomic activity, eventually routing nodes. Model is convenient, comprehensive and intuitive description of the process, help process optimization analysis, depends on the node type and semantics, semantic richness node will directly affect the ability to express the model.

According to the actual circumstances of the business process, proposed push-pull type business process model based on Petri nets. Petri nets have turned into one of the most widely used formalism for workflows model. Their expressive power and readability, especially in their high-level version, has proven sufficient to represent most of control-flow patterns of workflows [3]. The Petri net (PN) is a graphical and mathematical model tool that has such characteristics as concurrent, asynchronous, distributed, parallel, nondeterministic, and stochastic. It can be used to model and analyse various systems [4]. Petri nets have formal semantics definitions; graphical representations of

intuitive, graph theory and mathematical rigor phase support the theoretical advantages. Characteristic is that it focuses on the system changes, including changes of conditions, the result of the change and the inner link between changes. By analysing the business model and the operational characteristics of the supply chain, to form a single point model, multi-start model for business process model.

After business process model was constructed by using Petri nets, we using 6-R model (Role, Relationship, Regions, Resources, Risks, Reconfiguration) to describe the supply chain nodes and build supply chain model. According to the evolution of manufacturing systems models, different types of networked manufacturing system present the typical pattern for the corresponding. Network's important characteristic is its distribution characteristics and relationships between resources or ability. Follow this evolution path; the 6-R model defines the basic elements of a network, which provides a basic structure for the network design. In this model, Role, Relation-ship and Region mainly for the static structure, and describe the network's main static and operational characteristics. Resource, Risk and Reconfiguration mainly for dynamic structure, describe the performance of the network and the adaptive mechanism. Meanwhile, in each R, also includes many substructure properties.

The 6-R model as the Figure 4 shown, this model has a number of dimensions greater than three, better openness and interoperability, and also, its number of views can be determined according to their needs.

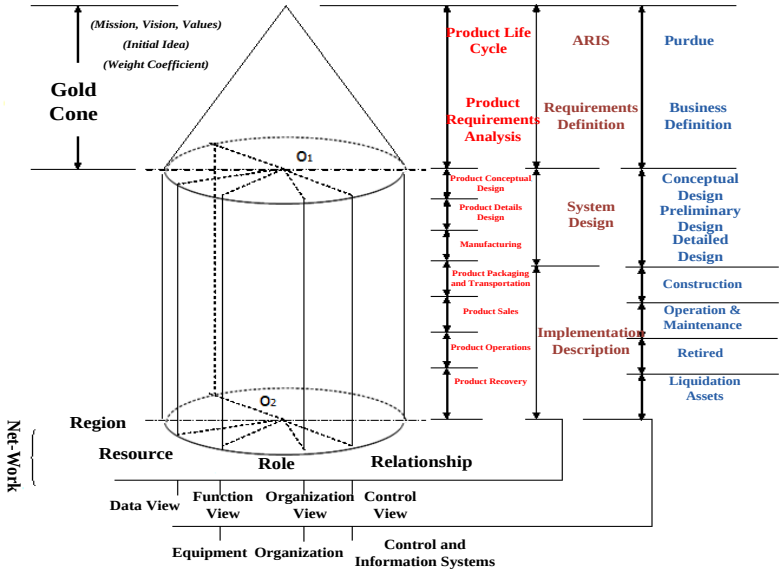

FIGURE 4 The 6-R supply chain model

The 6-R model provide new utility for enterprise supply chain node classification, description, publication, discovery and reuse, help enterprise from a new perspective of whole life cycle to re-examine its own position in the supply chain, optimize from each aspect, so as to speed up promote its sustainable development ability. It also can help enterprises optimize the integration of massive resources and other advantages of personalized, and make the enterprise in the unpredictable environment make agile response to rapidly changing markets and opportunities, the advantages of lower production costs, etc.

4 Integration information platform construction

4.1 APPLICATION ARCHITECTURE DESIGN

According to the National Bureau of standards, enterprise standards for requirements, to establish standard system of enterprise information resources, ensure application system integration architecture of advanced, stable, flexible, and guarantee data sharing timely, efficient and accurate.

Through the understanding of business operations and management requirements, based on enterprise business management model, analysis of the work of information technology. Under the condition of the core information system basically, the requirements for information platform focus on several aspects:

1) Information coverage to be more complete and information construction need to enterprise exterior supply chain.
2) Information management content to be more precise, in the supply chain must manage the smallest packaging unit.
3) To dig deeper into the data mining to improve data analysis capabilities, enhance the role of decision support information.
4) Further integration of various information systems; improve information management capacity and efficiency.

Enterprise put forward the information construction of three-tier architecture, respectively are control layer, manufacturing execution layer and enterprise management layer (see Figure 5).

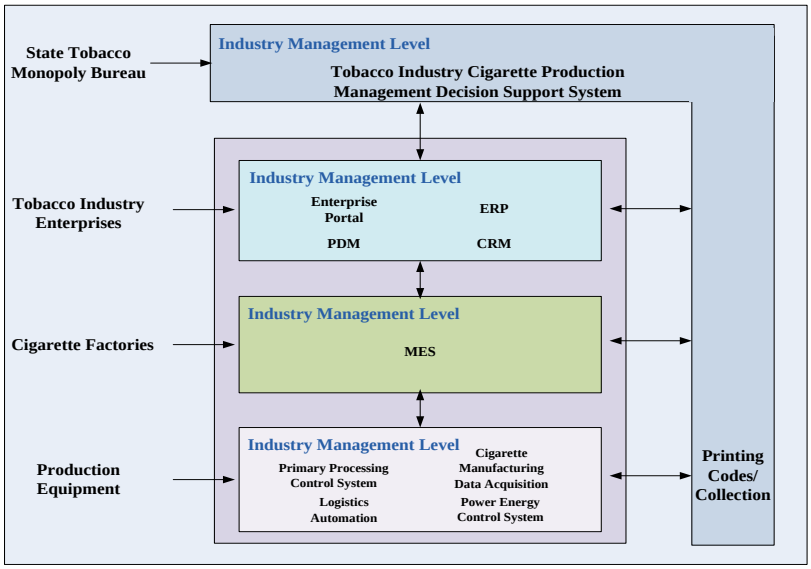

FIGURE 5 The three-tier architecture of the information construction

Enterprise Management Layer: Mainly includes that core systems construction in company, such as enterprise portal, ERP, PDM [5], CRM, and quality management system [6], etc. These application systems fully integrated enterprise logistics, information flow and capital flow, support the production and operation of enterprises.

Manufacturing Execution Layer: The core applications are manufacturing execution system, panoramic display technology embodied in flexible multi-specification, refinement, dynamic characteristics, comprehensive support production, quality, equipment, three major lines of business; achieve intelligent scheduling, digital equipment operation and maintenance, quality control, manufacturing process traceability, real-time performance analysis and integrated plant management.

Control Layer: Mainly includes primary processing control system, cigarette manufacturing department data acquisition, logistics automation and power energy control system. Implements the data collection automation, digital equipment operations, make data acquisition activity to realize scientific and rationalization and carry out the benefit maximization.

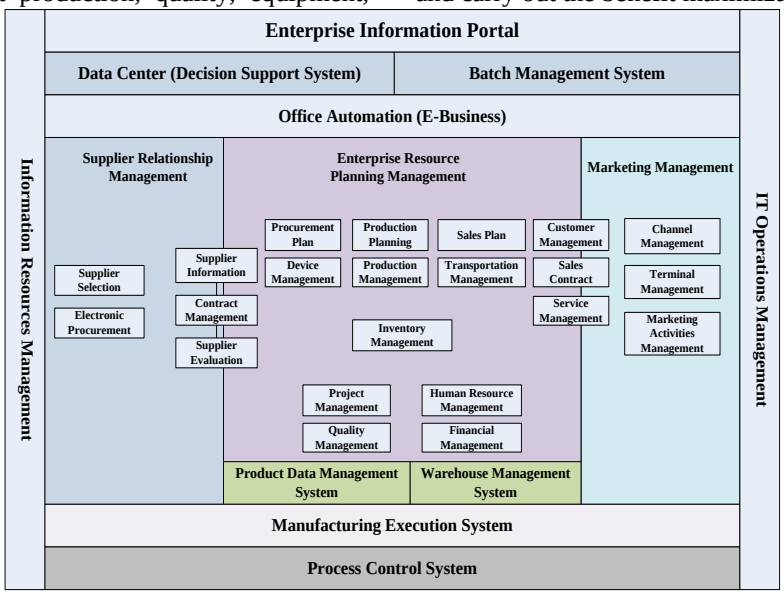

FIGURE 6 The application architecture design of the integration information platform

4.2 INTEGRATION ARCHITECTURE DESIGN

According to the actual system application and development trend of the future, design the overall top-level of information platform in enterprise. It must be meet the application system standardization, integration, visualization, real-time principles. At last, technical requirements mainly reflected in the following aspects: Introduction of data service bus and establishment of service-oriented enterprise technical architecture; Support heterogeneous systems, unified data storage management

and security management; On the basis of the data centre, and gradually establish decision auxiliary analysis system.

The integration information platform was constructed by using service oriented architecture (SOA) and SAP XI technology. SAP XI as the ESB transforms the formats of all data coming from source systems to realize the seamless integration among different systems. The service bus of SAP XI links different systems in enterprises and factories and realizes the seamless integration among multiple business systems of different levels. The application of information integration platform ensures the flexible and controllable information communication among application systems in enterprise at architectural level and solves the problems of information island, data quality and flow integration [7].

Enterprise adhere to the business requirements, and process and data integration planning, adoption of SOA architecture design, using the SAP XI (Exchange Infra-structure) as the enterprise service bus technology to form an integrated whole as shown Integration Architecture. The technical architecture mainly reflected in the following aspects, namely, with its special loose coupling, coarse granularity, reusability and interoperability, SOA has become the effective method of information resources integration management, and is the important development direction of realizing the fusion of tobacco industry information and IT industry. The essence of SOA is to integrate reusable services with distinct boundary and self-contained functions by the centralized management platform. The platform can link different services through the interfaces and the contracts defined among application services [8].

By using the SAP XI as the Enterprise Service Bus (ESB), and through by using the SOAP protocol and star-shape structure can realize the integration of various heterogeneous system. In the technical implementation, established star-shape connection with SAP XI as a central Hub, systems simply can make a connection with the SAP XI. In order to effectively avoid the sharp rise of complexity caused by the one-to-one connection between the middleware, system and system interconnect system integration.

Means for using the service transmission heterogeneous systems, rather than directly access each database, increase efficiency while also reducing the technical risk.

Using data bus technology has the advantage of architecture expansionary, the re-usability of data and ease of maintenance.

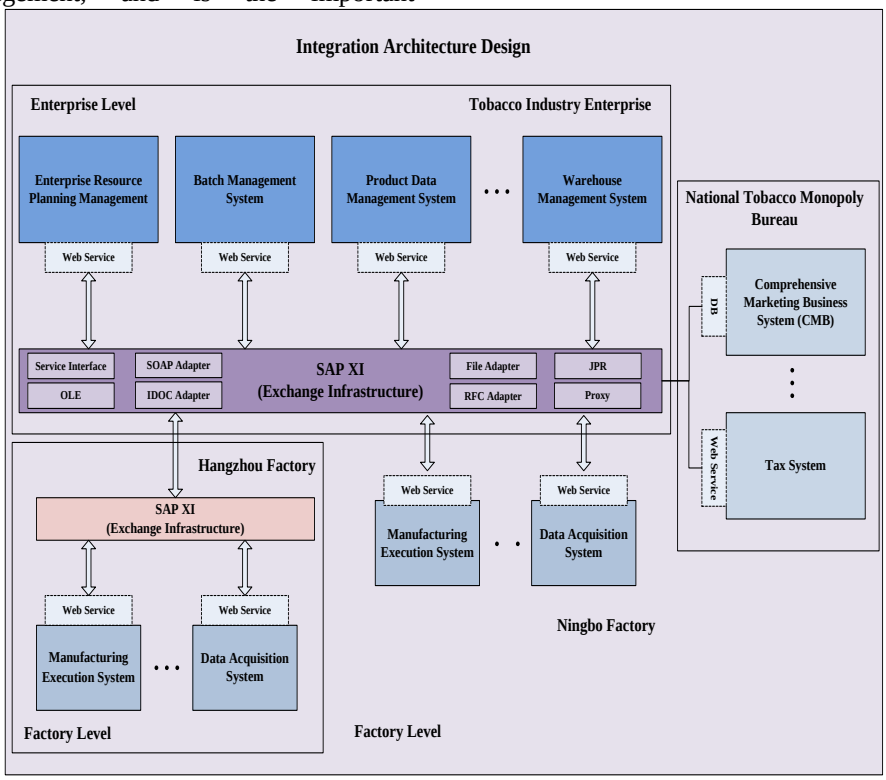

FIGURE 7 The integration architecture design of the integration information platform

5 Conclusions

In this paper, an integrated information platform for business and process engineering framework for synthesis and design in tobacco industry enterprise has been presented. The end goal of the integration information platform is to develop the information technology into the design, manufacture, marketing, procurement and so on each link, promote transformation and upgrading of enterprises, and build the modern tobacco industry enterprise. This paper illustrates the key business processes and builds the enterprise business model based on the self-assembled dynamic fifth-order business model. On the basis of the self-assembled

dynamic fifth-order business model, design and implement information integration platform, will promote the business management innovation and technology innovation with integration and development together, and improve enterprise's comprehensive competitiveness.

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