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Research on Operating Mechanism of Collaborative Commerce Based on Business Intelligence System ——An Analysis of the Application of Business Intelligence in Retail Enterprises

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Abstract: As a new management idea generated in the electronic commerce environment, collaborative commerce extend the range of business administration from a single enterprise to business partners. Business intelligence helps enterprises integrate data efficiently, and then turn the data into valuable information for enterprises, thus making the enterprise acquire knowledge and improve the ability of enterprise management and decision-making. The collaborative mechanism based on the business intelligence system makes the generation of information more intelligent and initiative. This paper identifies the operating mechanism of collaborative commerce based on business intelligence system, and we explore the application of business intelligence system in the retail industry.

Keywords: collaborative commerce, business Intelligence system, operating mechanism, retail industry

1. INTRODUCTION

With the growth of the economic globalization, business environment is showing a tendency of information, personal consumption, and production process complexity. Enterprises need to face the severe competition more than ever. It is impossible to become the industry leader in all the business. Only by cooperating with other excellent upstream and downstream enterprises in the industry, establishing a strategic alliance and realizing the complementary advantages, can enterprises adapt to the competitive environment of mass production, enhance market competitiveness and achieve win-win. In this situation, the collaborative commerce becomes the new business model today.

Collaborative commerce is a kind of collaborative competition and win - win business operation mode and the basic thought is based on market and customer demand. This business operation mode can achieve the effective planning and control of the whole supply chain information flow, logistics, capital flow, business flow and value flow in order to connect customers, research and development center, suppliers, manufacturers and service providers into a complete chain structure, thereby creating a competitive strategic alliance. Business intelligence can help enterprise integrate data efficiently and convert the integrated data into the information that is valuable to the enterprises. The use of business intelligence can make the enterprises gain knowledge and improve the ability of enterprise management decision. A large amount of domestic and international experience shows that the implementation of business intelligence is an effective means to improve the effectiveness and operation of collaborative commerce and guide the enterprises to make scientific decision.

2. THE CONCEPT OF BUSINESS INTELLIGENCE TECHNOLOGY AND THE CORE TECHNOLOGY

The term business intelligence was first proposed in 1989 by Howard Dresner, which describes a series of concepts and methods and support business decisions by applying supporting system. Business intelligence provides analysis methods of collecting, managing, and analyzing the data, then converts these data into useful information and distributes throughout the enterprise, thus improving the quality of business decisions. These data include not only orders, inventory, trading accounts, customer and supplier information in the enterprise

business systems, but also relevant information of the industry, competitors and enterprise external environment.

Technically, the focus of the business intelligence technology is data analysis. It involves some techniques including data warehouse, on-line analytical processing (OLAP) tools and data mining. Business intelligence analysis process contains extraction, transformation and load, namely, ETL procedure. Useful information is extracted from enterprise operation system first and then cleaned up to ensure correctness of data. The data are merged into the data warehouse of enterprises through the process of ETL, then analyzed and processed by the query and analysis tools, data mining tools and OLAP tools. Consequently, the information is turned into the knowledge of decision making, and then presented to managers to help them make smart business decisions. The basic structure of business intelligence is shown in figure 1.

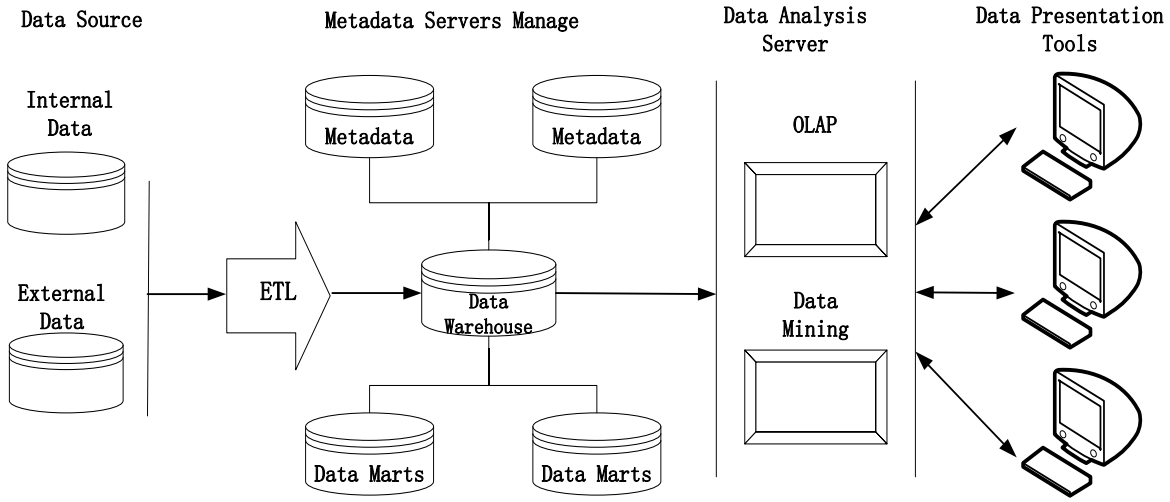

Figure 1. The basic structure of business intelligence

As can be seen from the figure, the data warehouse is the basis of business intelligence .Moreover, the OLAP and data mining are two different types of data appreciation operation on the data warehouse. Therefore data warehouse, OLAP and data mining are three pillars of business intelligence for enterprises.

It can explain the current situation and prospects of development of the product by users concerned about the extent of BI vendors. The following figure is the result of the survey about the major BI vendors. Large domestic enterprises are still the main use of IBM(Cognos、SPSS)、Oracle(Hyperion)、SAP(Business Objects).

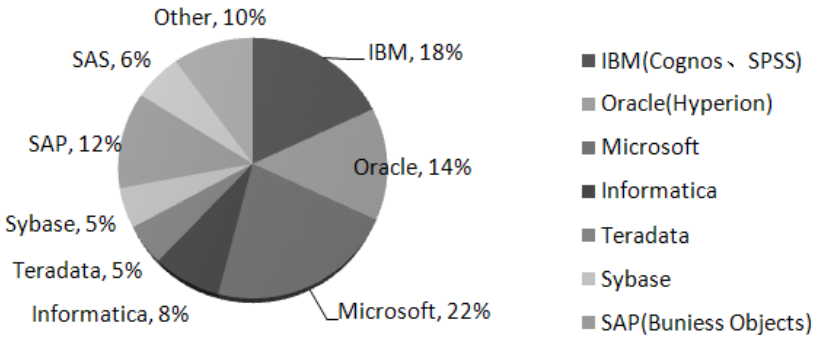

Figure 2. BI vendors proportion of concern users in China

3. MECHANISM OF COLLABORATIVE COMMERCE BASED ON BUSINESS INTELLIGENCE

At present, the business intelligence is an application solution or management thought rather than a kind of software products or tools. The information platform based on business intelligence brings a matter of

cooperative work to the operating model of business management. This article focuses on requirements, products and customers and researches mechanism of collaborative commerce based on business intelligence.

3.1 Requirement-Oriented mechanism of collaborative commerce based on business intelligence

Demand is the key factor of influencing enterprise's profit-making prospect and the acquisition of demand is a process of interaction between the two sides, which involves two main aspects, the market and users. Business intelligence system enables the enterprise to have a broader, more comprehensive perspective on the market and users. Cross-platform intelligent system based on information technology is capable of integrating a wide range of business information and sorting out preliminary requirements from a large amount of clues clues on demand. Requirement-oriented collaborative mechanism requires not only dig out the key problem from the various information sources but also provide advantageous basis for formulating correct demand plan. Accordingly, it needs an analysis and decision of real-time operating information, and then automates some general business problems processes according to some recognized programs. It help corporate decision makers predict various situations. These predictions include:

1. Changes in product price
2. Information of existing and potential market
3. User situations, especially special customers

Operation pattern is shown in the chart below:

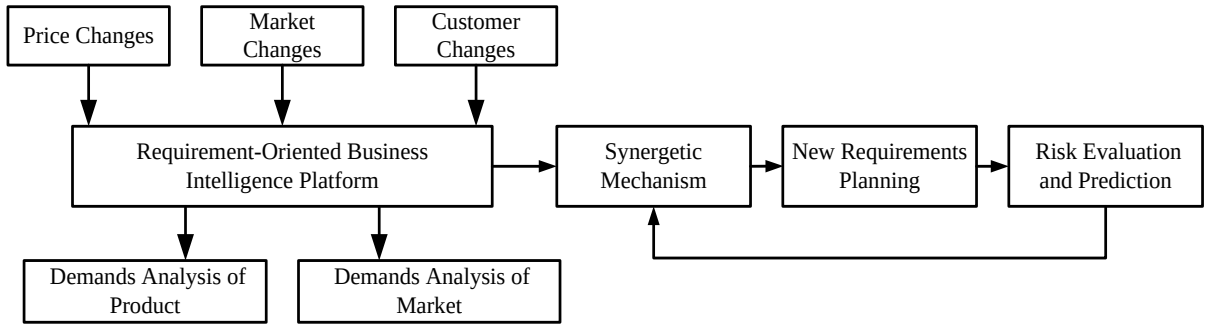

Figure 3. Requirement-Oriented mechanism of collaborative commerce

Requirement-Oriented business intelligence platform can integrate data by business Intelligence software in time according to the business information changes of price, market and customer, then get the analysis results of analysis result the current products and business opportunities. Enterprises can develop a mathematical model by using the business intelligence system, which involves some Business indicators such as inventory, product sales, profit rate, should yield rate, sales, inventory, market shares and business risks. The mathematical model can be used to reflect enterprise's overall operating and help managers get the relevant information of different departments and business processes. Business intelligence system also helps establish collaborative mechanism according to the analysis result, thus assisting in drawing up a new production demand plan. After that, managers can conduct risk assessment and prediction in order to guide future plans.

3.2 Product-oriented mechanism of collaborative commerce based on business intelligence

Cooperating with upstream and downstream enterprise and making best use of resource become the only choice for contemporary enterprise. Enterprise shall establish an efficient mechanism to achieve collaborative commerce with the upstream and downstream partners. In terms of the upstream providers, enterprises are able to provide data and information of original m materials, especially allow providers to manage their inventory in order to reduce the inaccuracy of providers' marketing forecasting. Enterprises can also get the price changes of

raw material, technology and quality information, and even can participate in product design to meet the needs of customers better. In terms of the downstream distributors, enterprises can provide inventory and production information of finished product and help distributors response to customer demand in time. Meanwhile, enterprises can obtain inventory and customer demand changes information to adjust their production strategy quickly.

The application of business intelligence system can successfully realize the dynamic cooperative process, keenly observe the changes in the sales situation and timely inform the enterprise decision-makers the information gained from the business intelligence system. In addition, the analysis result is provided to help managers make and adjust strategic business decisions. Decision-makers can adopt some strategic such as:

1. Formulate the corresponding product strategy and sales promotion planning scheme according to the relation between sales data and external environment factor.

2. Establish strategic alliance with upstream and downstream enterprises to realize reasonable allocation of production and sales resources.

Operation pattern is shown in the figure 4:

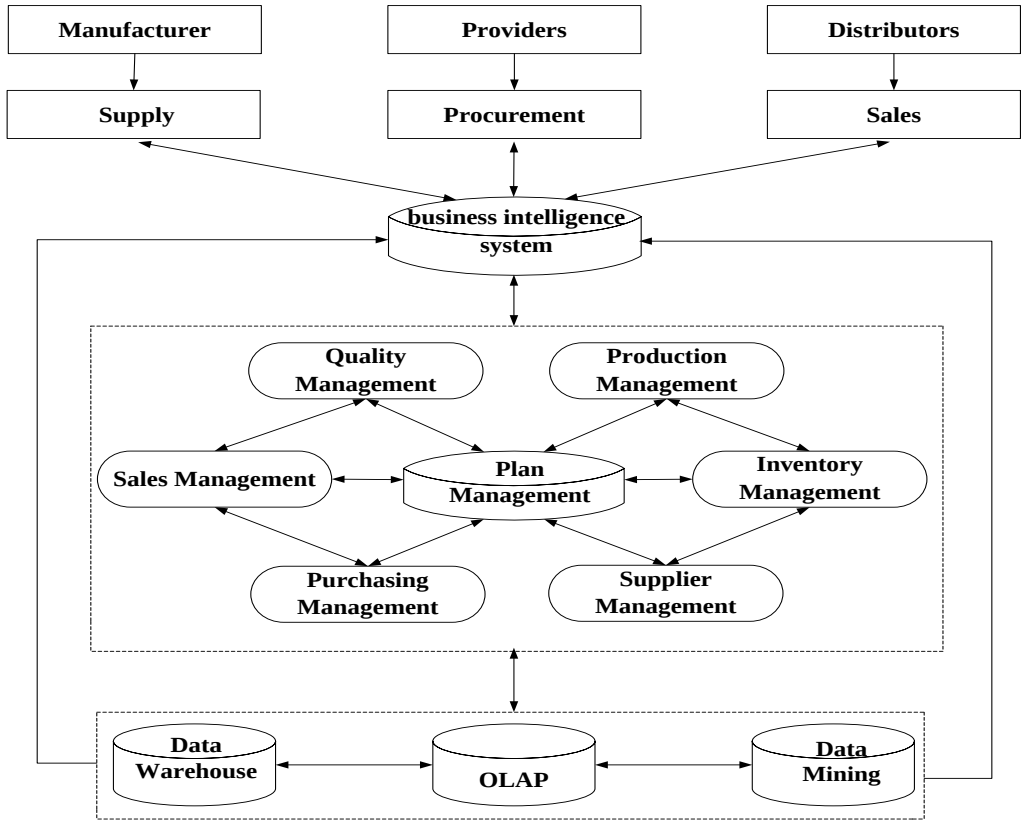

Figure 4. Produce-Oriented mechanism of collaborative commerce

The produce-oriented cooperative process based on business intelligence system is dynamic and interactive. Every link of the system should be structuralized and interconnected in order to achieve mutual cooperation.

3.3 Customer-oriented mechanism of collaborative commerce based on business intelligence

Customer-oriented mechanism of collaborative commerce mainly focuses on establishing a efficient customer management system to coordinate and distinguish customer relations, then carry out the corresponding strategy. Business intelligence provides a series of customer-oriented data analysis method for retaining existing customers, developing new customers in order to ensure the marketing share of the company increase steadily in

the industry.

Business intelligence can be used to establish customer files and analyze the customer information and requirement. In addition, it can be employed to classify customers according to different sex, age and occupation, and then the results may assist in understanding consumer psychology of different level, different sex, different age and different cultures, thus taking preferential measures in terms of the importance of the customer.

Business intelligence can also help enterprises develop potential customer, forecast the variation tendency of consumers, according to the changes of customer type and business income, and provide the basis for conducting marketing campaign. In this way , customers and resources can be integrated by analyzing customer type, customer loyalty and customer creditworthiness, thereby enabling enterprises to find more collaborative opportunities. The application of business intelligence can greatly improve the flexibility of enterprise handling customer group collaborative relationship.

4. THE APPLICATION OF BUSINESS INTELLIGENCE SYSTEM IN RETAIL INDUSTRYHAT

Great changes have taken place in the retail industry after information technology widely penetrated into retail industry. The data warehouse of retail industry collects a large amount of the original transaction data, which includes the original sales data on the front end equipment, such as point-of-sale machine and scanister, and inventory data of every store. The business intelligence technology will turn data into information, and then turn into knowledge to optimize traditional purchasing method through the automatic data acquisition technology. Optimal order quantity, optimum product mix and appropriate way of displaying goods can be formulated by mining data from massive accumulated original data. In addition, the business intelligence technology can also help retail enterprises reduce the storage cost and precisely analyze market opportunities.

After many years of investment and development, retail enterprises has experienced a developing course from point-of-sale machine system used by sales counter to the MIS system and OA system, and to business intelligence system. The entire retail enterprises have realized information operations from bottom sales to middle management, and to high-level decision-making. Figure 4 shows the information model of retail industry.

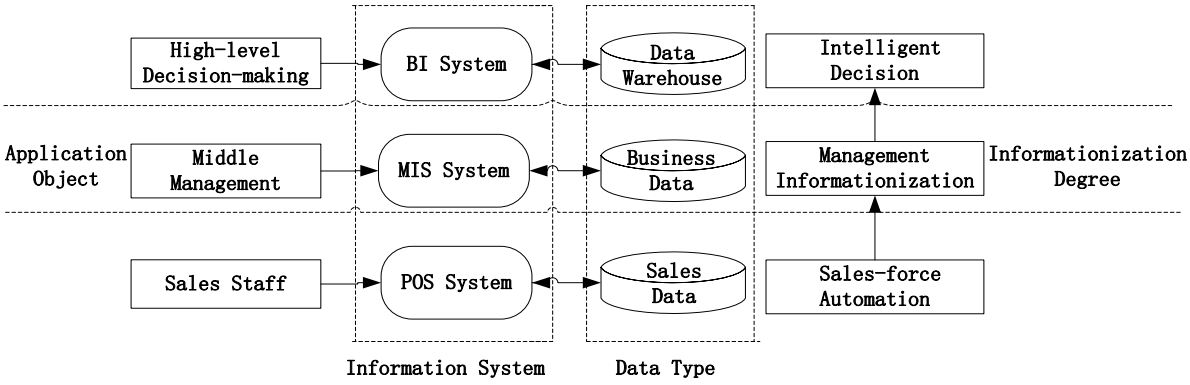

Figure 4. Information model information model of retail industry

A perfect business intelligence system for retail industry should have the following basic functions：

(1) Business plan: new product introduction plan, merchandise plan, commodity purchase plan, fund utilization plan and commodity sales promotion plan;

(2) Product configuration: commodity category distribution, commodity prices, brand, production place and business practice distribution;

(3) Procurement techniques: new product introduction technique, commodity purchase technique,

commodity elimination technique and supplier elimination technique;

(4) Sales analysis: sales promotion activity analysis, promote sales quantitative analysis, commodity price adjustment analysis, commodity sales ABC analysis, commodity sales performance analysis, unsold commodity analysis and commodity sales contribution rate analysis;

(5) Inventory analysis: Replenishment situation analysis, inventory carry rate analysis, inventory capacity analysis, inventory caustic excessive analysis, inventory warning analysis and guarantee period analysis;

(6) Fund analysis: pay status analysis, promotion fund analysis, procurement fund analysis, and marketplace cost analysis;

(7) Customer analysis: general customer analysis and VIP analysis.

Retail enterprise information system produces precious information for decision support, including goods structure, Sales, inventory and clients information. The role of business intelligence is to highly generalize and summarize all kinds of data in order to form enterprise management situation analysis reports for enterprises and senior policymakers to make efficient strategic decisions.

5. CONCLUSIONS

The operating mechanism of collaborative commerce based on business intelligence system is actually a decision-making mechanism. It makes enterprises achieve synergistic effect among the internal departments, enterprise and customers and form a collaborative model. All business chain members could realize collaborated procurement, collaborative product design, product production, product distribution and product delivery under unified planning in order to achieve information sharing and business collaboration among all enterprises in business chain.

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