Research of CRM/ERP Integrated Systems for New Materials SMEs with Scattered Customers

Kai Yang, Wu Zhao, Jun-song Zhang, and Xiao-long Li

Abstract Customer relationship management (CRM) is inseparable from enterprise development, customizable CRM software of small and medium-sized enterprises (SMEs) has become a trend for the problems in scale and standardization, especially for these SMEs in sophisticated technology. In the paper, a CRM and ERP integration system is proposed by the application in a new material company. Because of the combination with the competition in the market and the company's operation situation, the personalized enterprise workflow is presented by special needs in this company. Moreover, the methods of modular design and the functionality integration theory of CRM and ERP are made the system user friendly and scientifically. By the integration of these modules, the system has met the business needs in the special processes in relevant department.

Keywords CRM • SMEs • Modular design • Demand analysis • Functionality integrated theory of CRM and ERP

1 Introduction

Along with social progress and the development of world economic integration, the competition among enterprises is increasingly fierce, The traditional business model of a fundamental change occurred, Enterprise competition developed from "product-centric" to "customer-centric". Due to the rapid development and applications of the technology of computer, communication and network, to choose products and services become more and more easy. In this case, how to build and maintain customer relationships, how to improve customer satisfaction and

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loyalty and ultimately improve the competitiveness of enterprises has become an important issue that was placed in front of the corporate [1]. CRM is a method to acquire customers, and increase the number of profitable customers too [2]. The earliest CRM originated in the United States, primarily focus on customer segmentation management. Now it has become a leading, customer-centric business management theory, and it is also a kind of specific software and implementation methods to improve the income of enterprises by improve customer satisfaction via the information technology [3]. Since 1999 Gartner Group Inc put forward the concept of CRM, the CRM market has been in a state of an explosive growth. In recent years, foreign CRM industry has been a very high level of development. The domestic market, by contrast, has great potential, but lack of heat in enterprise users.

After the trend set off by CRM in large enterprises, today's development for supporting vendors has gradually become mainly by the large quantities of demand of SMEs. Significantly different from China's large enterprises in the areas of management, finance, human resources and market, SMEs' generally management tools is relatively backward and the sales management is not standard [4]. Although there are number of CRM software on the market, and be constrained by the normalization process of large enterprises, but few truly fit the needs of the status of SMEs. The available CRM and SMEs has a low compatibility. CRM software market varies greatly, there are many difficulties and problems, but the reality is not whether to use the CRM system or not, but how to make good use of CRM [5]. Thus in a few years ago, the development of the CRM software for SMEs has become a hot research topic in the research and development, the research and development about on-demand CRM plays an important role in the theoretical development and practical application of the CRM of SMEs. Requirements of sophisticated science and technology enterprises is one of the most complex requirements, they have unique difficulties and problems of their own. For those enterprises that have not or are considering establishing ERP, CRM building process must be taken into account the integration of the two [6–9].

The targeted company in this paper is a sophisticated technology company professional in R & D and product new materials tape. As there are many differences in the characteristics of industry and types of customer, the construction of information systems is more difficult than that in other industries. The company's workflow conflict is due to internal demand, it's difficult to regulate. The trials of CRM software failed to meet the demand. The article firstly discussed the CRM and ERP theory of SMEs, CRM and ERP combining design concept, etc. Then analysis to understand the business development status and contradictions of demands, and conduct a in-depth study about the development of CRM for new materials R & D technical SMEs. Through a detailed demand analysis for customers to establish their precise needs, use the modular design method, summed up the specifications for the target enterprises business processes, create unique software functional modules, meet the demand for design CRM for the special needs of technology-intensive enterprises. This paper has presented functional integration of ERP and

CRM system On the basis of requirements, there is no existent border between them, and the functions that business needs belong to ERP in the software have been implemented, such as internal processes function, security function.

2 Demand Analysis of CRM System

Functional requirements analysis for the system [10, 11]: the company has just been established, it is still in the growth stage, and it is in the first place in China that capable of producing Teflon tape. It belongs to technology-intensive small and medium-sized enterprise, the company conducted its own R & D team to research and development, its products are sold at home and abroad, over a very wide range of applications. Its main business is in the form of B2B, primarily for the enterprise. Its customers add the company's products into their own products, and then sold to other customers or enterprises to win profits or access to services. The company's customers have some characters, such as across the country, scattered, less demand for the products, but because of the strong competition for the company's products, the customers' demand are very stable. There are also the limitations of development for CRM system from previous analysis. The company had tried several CRM systems, their basic CRM functionality can be used, such as customer information management, sales management, but some functionality nominally exists are not available. Including, but not limited to, the following question: No person in charge of storage and no product unique number in Warehouse Management module. Their software operating authority function greatly does not comply with the requirements of the company, there is no strict and clear distinguished permission, any user can access software could operate most of the functionality, it is not conducive to the hierarchical management of software functionality within the enterprise. Most software do not reflect the work process, even if there is, they also can not fit reality, the much-needed processes of software process management are handling of complaints, after-sales, finding and managing sales opportunities, out-put and in-put of sales and warehouse management, contract approval process and so on. In summary, the problems of the company can be grouped into the following broad categories: (1) Difficult to regulate processes: Notwithstanding the company have its own set of work processes, with the widening of businesses and organizations, the process has not been documented yet, and the company itself still belongs to small and medium-sized enterprise, operational flexibility, this cause the phenomenon that it is not easy to regulate the workflow to integrity and unity; (2) The company's Sophisticated technology need to be kept confidential, but had to present their Non-confidential personnel access to the company's confidential technology by go through the sales process or production processes. This is the company's internal contradictions.

Demands analysis for the company: to communicate with the warehouse management, sales staff, sales logistic personnel, sales manager, general manager and other personnel, get the demand and comprehensive consider the characteristics of

the industry. According to the process we need to have the following functions: (1) the contract need to be very clear comply with the process of company's organization approval, sign and save; (2) handling problems in Sales: Pre-sales opportunity process, complaint handling in sale and after-sales service, records, submitted, solve, archive of complaints, etc.; (3) management for customer rebate, commission statistics; (4) the need to add warehouse management, Integrated software product management and storage management into the CRM software to facilitate staff operating as multiple roles; (5) other process details. In addition, the permission settings of the software are divided strictly in accordance with the direction of the workflow. Demand of other aspects: Before propose CRM solution, we must not only ensuring the functionality of CRM software to meet the functional requirements of the enterprise, but also taking into account to ensure that consistent with the development plan of enterprises. In general, to achieve to be an economic, practical, targeted quality program, firstly CRM of SME needs to be with features like simple, easy-to-use, short implementation cycle, easy maintenance, etc. [12]. The company's products are in less product range, easy to manage, with a small amount of data. In the longer term there is no demand for remote operation, therefore there is no special needs for system performance and system data.

After the demand analysis, we determined toward or contents, the details of the functional requirements and permission requirements of the business processes. Drawn the detailed understanding of the results of demands analysis into the specific needs of illustration, and add the privileges assigned demand. Now cite the analysis results of the specific needs of the customer management, as Fig. 1.

The figure integrates a variety of customer-related information needed by company into several function points. Each key point contains detailed functional classification and description. The figure shows the links with the various functional points, among them the customer data register basic information of customers who deal with our company, the function block content which is the foundation for managing the others information of customer, mutual jumps to other function blocks which are all linked by the basic function block. So that you can open quotation, contracts, complaints and other information in the sales process via the customer data being viewed.

3 Modular Expression the System

After develop business processes clearly, using modular design method to conduct block design [13], to be fully prepared for the establishment of workflow management [14, 15]. The module design reduce the complexity, make it easy to maintain, modify, the parallel development of different parts which the support system is easier to implement, that will help to improve product quality, shorten the design time of the system, which will help the software replacement. Main ways to design

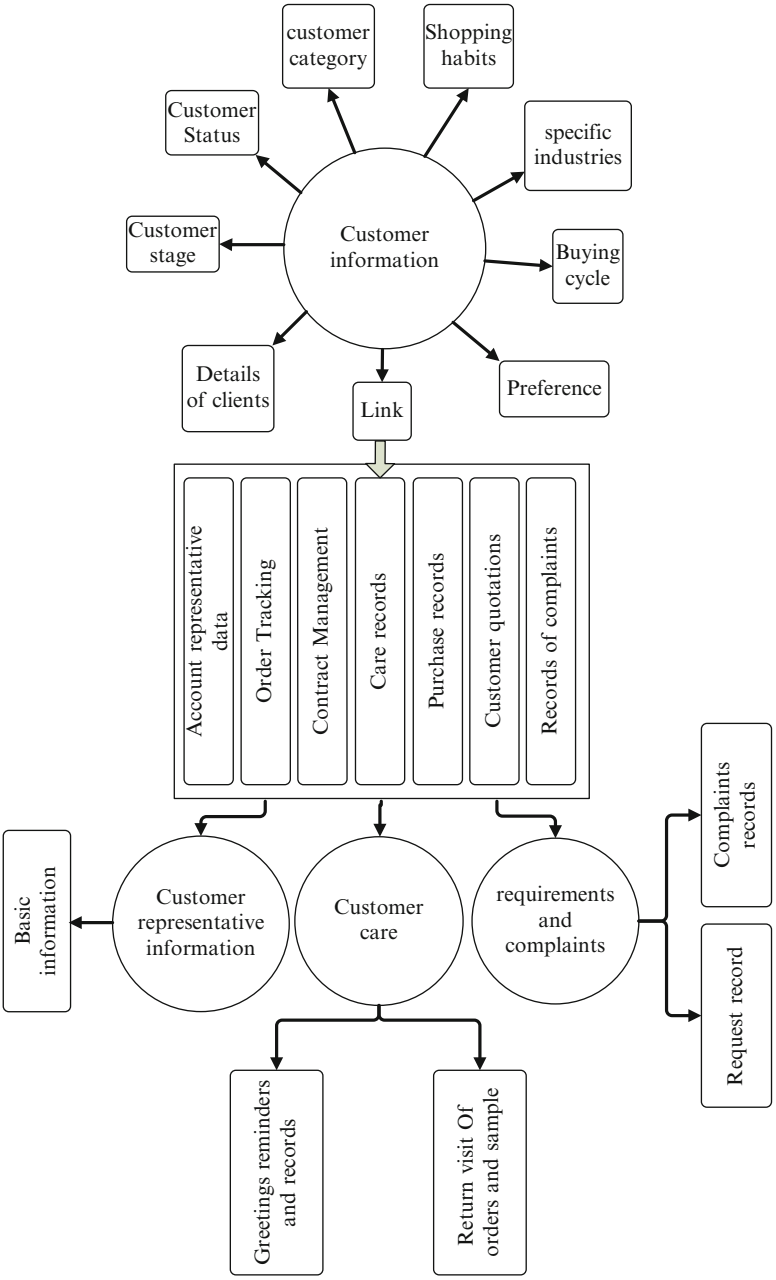

Fig. 1 Illustrations on the specific needs of the customer management

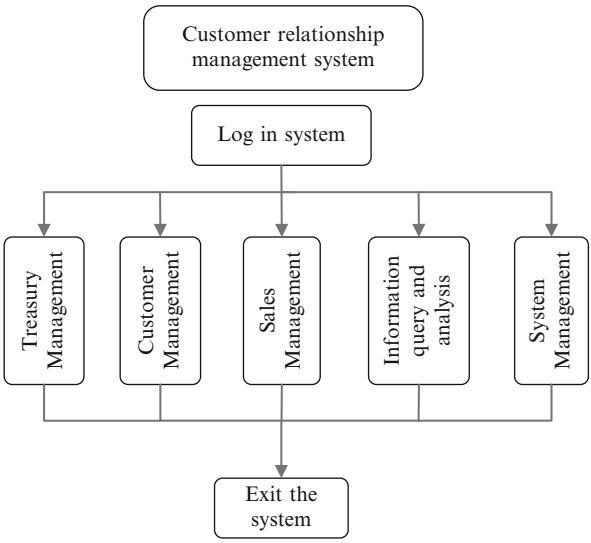

Fig. 2 Customer relationship management module

modularized: (1) cross-series modular design; (2) vertical range of modular design; (3) a full range of modular design. In this paper, we choose the cross-series modular design. Use the existing CRM software modules develop deformation products without changing its main parameters. Replace or add modules in the original type software, generate suitable CRM software for the new materials company. The design principles are: to make products keep high precision, stable performance, simple structure, low cost based on the meet of the requirements of products, module structure and links between modules should be as simple as possible, standardized.

We establish the following modules from business process analysis and management needs: (1) system management module: landing permissions settings, assign permissions management; (2) Customer management service modules: Customers detailed basic information, customer shopping habits, customers VIP level management, customer care reminders, customer visits, customer suggestions records, customer complaints, etc.; (3) Warehouse management module: contains the storage process and product management processes, can contact the production update product demand at any time; (4) Information query and analyze module: connotation data mining, data analysis; Containing both sales back office performance combined with ERP, summary report statistics, facilitate the management of the company to appraisal employee performance and rapid response to sales data; (5) Sales management module: includes sales management in pre-sales opportunity marketing and in sales, order tracking included in the process, after-sales management, contract management, and other content.

The established customer relationship management module, as shown in Fig. 2:

The first two modules are the type of basic function module of CRM; the last three modules belong to modules combined with function of ERP. Use the function to make the CRM software modules extracted from ERP system, as shown in Fig. 3.

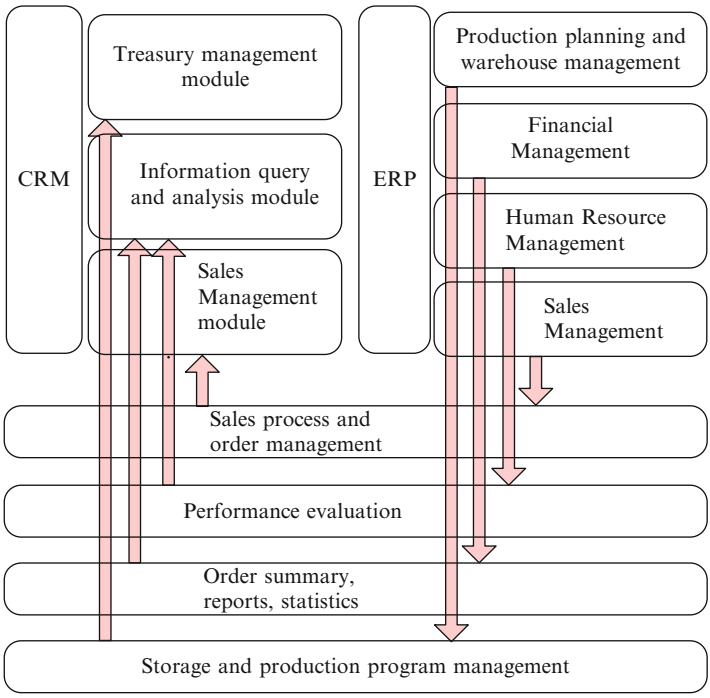

Fig. 3 Relationships between CRM and ERP

Other design issues: Selected development tools according to the requirements and modular design: The CRM software design of this article selects the popular programming language C#, It includes single inheritance, interfaces, almost the same syntax with Java, and the same process that compiled into intermediate code and Re-run, it also draws on the characteristics of the Delphi, directly integrated with COM (Component Object Model), it's safe, stable, it has powerful operability, elegant syntax style, features innovative in language, convenient Programming Oriented Component. The system architecture using C/S structure, it has the advantage of simple operation, easy management, high efficiency, small server-side pressure, high security and other advantages. Choose Visual Studio 2008 for programming tools. We select SQL SERVER2005 for database tools; it has the ease-of-use, scalability for distributed organizations, the data warehouse function for decision support, closely associated integration with a number of other server software, good value for money. The choices of the above tools are suitable in this case.

After conceptual design, convey the demand for the company's by the visual form through the thinking of the understanding and distinguish between the objective world via conception, judgment, reasoning, and argumentation. Build customer information table, product information table and any other forms that

needed, establish the linkages between the form, According to the specific database management system, a variety of storage structures and access methods rely on the physical design measures of specific computer architecture, choose the most appropriate physical storage structures, access methods and access paths for specific application task.

4 Conclusions

Up to now, CRM has been paid much attention to the constantly ongoing exploration. This paper is for a technologically sophisticated, internal demand contradictions, functional requirements do not match with the existing CRM system software in the market, emerging small and medium-sized new materials enterprises, use the modular design approach, successful implement the software design by lot of detailed demand analysis at prophase. Its structure is simple, targeted, and full-featured; achieve the workflow management, in line with the current software development trends of integration design of CRM and ERP.

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