

Research on Implementation Path and Strategies of Enterprise's Mobile Informatization

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Abstract—Mobile informatization as its real-time, mobility, personal characteristics is changing the operating mode of enterprise, and enterprises are gradually moving into the mobile informatization. This paper introduces an analysis method (IEB) based on focused three-layer structure. Through analysis of industry characteristics and sensitivity to mobile informatization, enterprise itself and specific business processes, it ultimately determines the implementation path and strategies of mobile informatization. In the end, the paper takes a pharmaceutical enterprise as an example, using IEB method proposed in this paper to make its implementation path and strategies of mobile informatization.

Index Terms—Mobile informatization; Implementing Path; Strategies; Industry Sensitivity

I. INTRODUCTION

In the past few decades, informatization has become the trends of world's economic and social development. Information technology is changing the operating mode of production, operation and management in enterprises by its characteristics of efficient, fast and low-cost. Enterprises are also adapted to the revolution, change the traditional business management model, make full use of information resources and improve the economic efficiency and competitiveness by implementation of informatization.

Information technology develops continuous from radio to TV, and then to the emergence of the internet, and has brought a revolution to people's lives and social production. Now, with the development of network technology especially for wireless network and the popularity of mobile communications equipment, merging of internet, mobile communication technology and other technologies become a tendency, and activities of enterprise management and business is running on mobile internet now, which trigger deep-seated changes of production, marketing, management and other fields in enterprises, and bring new business opportunities and challenges to enterprises. Facing with the new environment, enterprises must dare to implement not only informatization, but also mobile informatization [3].

However, mobile informatization is not achieved overnight and suitable for all enterprises and businesses. It requires detailed analyses of enterprise business

environment, internal resources, mobility needs of business, difficulties of implementation, technical preparation, etc. After that, we can make implementation path and strategies of mobile informatization which are tally with the actual situation of enterprise.

II. THE CONCEPT AND CHARACTERISTICS OF MOBILE INFORMATIZATION

A. Concept of Mobile Informatization

From the popular concept, mobile informatization is the process that using phone, PDA and other handheld devices, via the integration of telecommunications and internet technology to realize mobile application of government and enterprises, finally to achieve the purpose of working anytime, anywhere.

B. Characteristics of Mobile Informatization

There are already many scholars have summarized definitions and characteristics of mobile informatization. On this paper, author conclude the unique business advantages and value of mobile informatization to three key attributes, which are differ from existing informatization technology based on fixed-line, as shown in figure-1:

- Real-time: mobile users can access to services and enjoy the timely information anytime and anywhere.
- Mobility: mobile devices are easy to carry and not limited to fixed lines.
- Individuals: mobile devices belong to individuals, and they can realize peer-to-peer marketing application.

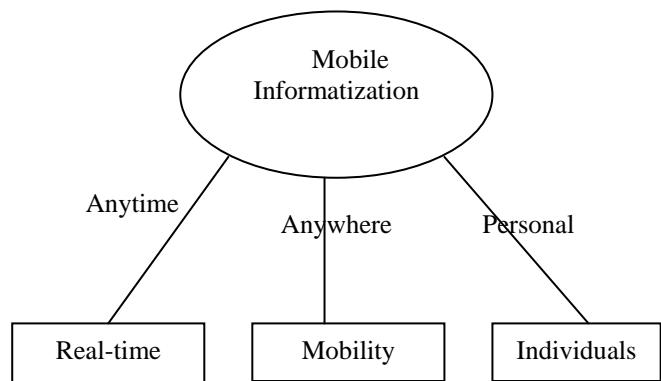


Figure 1. Characteristics of Mobile Informatization

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C. Development of Mobile Informatization in China

At present, China's mobile users reached over 400 million, which means there are great business opportunities for implementation of mobile informatization in enterprise. As the world's biggest mobile communications market, by the end of 2007, the number of mobile end-users is more than 600 million in China, which is one-fifth of the world's three billion mobile users, the number of Chinese mobile phone users in 2006 with than 16.7 percent growth, 28.9 percent of internet users have used mobile phones to access internet; these mobile phone users are foundation of mobile informatization applications. A research report issued by CCW Research in 2007 show China's mobile informatization market has amounted to RMB14.7 billion Yuan, up 31.3 percent year on year; and the main impetus for such a growth comes from the development of mobile commerce and mobile applications of government affairs [8].

III. ENTERPRISE'S MOBILE INFORMATIZATION APPLICATION

Enterprise's mobile informatization is a process that integrates enterprise businesses with mobile businesses and extends e-flow to personal mobile terminals by using the wireless network, achieves the interaction of enterprise application server with mobile terminal. The basic characteristics of enterprise's mobile informatization are getting and managing information portable, anytime and anywhere.

With cell phones as the carrier, mobile informatization bring enterprises many advantages including low costs, flexible applicant, free from restrictions in terms of time and zone, so it will commendably satisfy the demands of general enterprises, small-and medium-sized enterprises.

At present, there is more and more enterprises pay attention to mobile informatization. Accord to a survey of enterprises in several large cities of China by mobile Internet, 58% of surveyed enterprises would like to try the application of wireless internet technology; and mobile informatization solutions are gradually change from simple horizontal application such as group messaging, blessing, notice remind at the beginning, to in-depth vertical services as shift logistics, sales, management and so on. Although the market has great potential, but mobile informatization is still at the initial stage in China, some enterprises feel puzzled and most of mobile applications are just in the pilot level. There is still a long period to sophisticated mobile informatization applications.

Looking at current enterprise applications of mobile informatization, which can be divided into the following three types by evaluation of implementation difficulties, network connection type and information complexity:

The first type: mobile office applications for staffs. Applications of this type include Mobile Email, Personal Information Management, Wireless Internet/Intranet Access, SMS and Group Messaging, Mobile Office Collaboration System; all of them are almost typical

horizontal applications that suitable for low-bandwidth network and less interaction with client.

The second type: supportive mobile applications for customers, including field sales and sales-related employees. Some applications such as Task Assignment and Scheduling (Mobile Marketing Systems and Mobile Customer Relationship Management System), Mobile Data Collection and Inventory Inquiry System belong to this type; they can be defined typical vertical applications which relate to specific industries and processes.

The third type: the more complex application of mobile ERP and mobile SCM face to customers. As professional vertical applications, they can transmit detailed inventory, information of parts available, step-by-step diagnostic and repair instructions, client/equipment or purchase records to the front desk employees. This type of application requires a higher bandwidth network and advanced terminal equipment for transmission of abundant information [1].

IV. IMPLEMENTATION PATH AND STRATEGIES OF ENTERPRISE MOBILE INFORMATIZATION

The age of mobile informatization has come. Facing with this new mobile technology and new mobile applications, enterprises should be positively, utilize new technologies and new applications for their environment, they would keep costs down and improve efficiency, rapid response to wide range needs of customer and enhance competitiveness.

As industry characters, enterprise internal conditions and business needs are different, the demands of mobile informatization also will be different, so it is necessary to analyze each enterprise in detail and then determine its implementation path of mobile informatization. First, distinguish from the industry affiliation; due to the characteristics of various industries are not the same, their focus of concerns and invest mobile informatization are different. Second, analysis the internal department of enterprise; evaluate those business units of enterprise which are suitable for mobile informatization applications, and determine the priority order and key departments of implementation with considering resource limitations. Finally, focus on business processes; analyze main business processes in enterprises to get implementation path of mobile informatization, which is also considering business demands, difficulties of implementation and preparation of technical.

According to this thinking, the paper puts forward a three-layer method of determining the implementation path of mobile informatization for enterprises which is based on Industry/Enterprise/Business (IEB). That is, first of all, analysis the industry characters and industry sensitivity of informatization; secondly, focus on the enterprise internal, analysis the demands and applicability of mobility in every departments; finally, determine the implementation path of business considering actual resource, difficulties of operation and key demands of business. The method is shown in Figure-2.

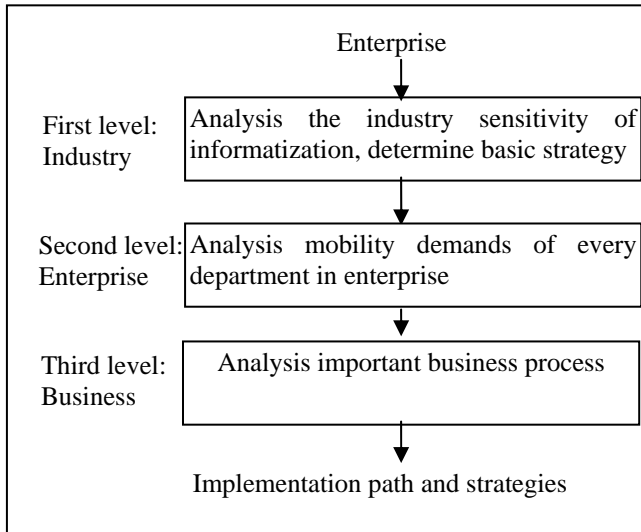


Figure 2. IEB Method

A. Analysis Industry Sensitivity and Determine the Basic Strategy of the Industry

Each industry has its own characteristics, and the response and adaptive way of the wireless network may be different, so the adaptive degree of industry is called industry sensitivity. The sensitivity can be judged by the speed and depth adapting to wireless network. Speed refers to how fast the enterprise can be reconstructed by network, in other words, network application condition in this industry, it is usually measured by the proportion of network investment, number of enterprises access internet, online transaction volume ratio and other indicators. The depth refers to the scope of transformation in the industry by network, that is, the quality of network application; it is usually measured by the transformation condition of the supply chain, such as effect of transformation and scope of applications.

Measured by industry sensitivity above, all industries can be divided into four types: the destructive type, complementary type, adaptive type and unresponsive type. As shown in Figure 3

Depth ↑	
Adaptive Industry Delivery Industry Fast Circulation Industry Manufacturing Industry Government	Destructive Industry Insurance and Securities Company Banking Media Industry
Unresponsive Industry Construction Industry Agriculture	Complementary Industry Publishing Industry Tourism, Retailing Entertainment Industry
Speed →	

Figure 3. Industry Sensitivity

Destructive Industry refers to those industries whose core business can run on wireless or wired network and can be fast reformed, such as the securities industry. Enterprise in destructive industry often have better information environment, and as a result of its core business running on network, enterprises must develop related wireless network-based services and products. Therefore, enterprises of this type must analyze the influence of wireless applications on enterprise strategy, then focus on a series of reforms, and promote mobile informatization applications as soon as possible.

Complementary industry means those companies which can quickly develop new business by making use of advantage of mobile devices, and these new business based on wireless network and traditional business can be mutual promoting, such as the entertainment industry.

Adaptive industry is that the industry can be profoundly transformed and improved by taking advantage of wireless network; however, the pace of transformation will be relatively slow, such as the distribution industry.

For adaptation and complementary industries, they already have some informatization foundation, no matter the top manager nor bottom tier employees in enterprises, all staffs have recognized the positive effect of computer and information technology application, and most important is that they have mastered some technology and talent reserves. Therefore they should continue to promote the construction of informatization; meanwhile, they should use new mobile applications such as Mobile Office, Mobile Email, Mobile Customer Management applications and other supportive applications to improve the flexible and adaptive of organizations, shorten distance between market and customers, better integrate internal processes and connect "Information Island" by wireless network.

Unresponsive industry refers to those which don't have high requirement of information and strong will to reform, and they wouldn't be deeply affected by outside environment. Although businesses in these industries can get better support and improvement by wireless network, but the process will be slowly, such as agriculture industry. As to enterprises of unresponsive industry, informatization level of them is not enough and they are lack of management systems and high quality staffs, network has little influence on their products and cost. Therefore enterprises in this type should focus on future development, mainly set up internal information system to meet the needs of information dissemination and sharing. Some types of Mobile Office System for staffs will be adaptive and they can reduce costs and improve efficiency of enterprises [1].

B. Focus on Enterprise Internal

After analysis of industry sensitivity, the strategic direction and focus of mobile informatization in this industry can be confirmed. So main purpose of this layer is to analyze different business needs for mobility considering the actual situation of enterprises, then determine those key departments which need and adapt to mobile informatization.

Each enterprise has different mobility demands because of different business process. On this basis, the paper take some of the key general departments in enterprise as the evaluation objects, mainly including: office working, marketing department, produce and

manufacture, research and development, supply chain and logistics and purchasing department, and take real-time, mobility, individual mobility and complexity of implementation as indicators, the evaluation table as follow Table-I.

TABLE I. EVALUATION OF DEPARTMENTS TO MOBILE INFORMATIZATION

Department Evaluation Index		Office Working	Marketing Department	Produce and Manufacture	Research and Development	Supply Chain and Logistic	Purchasing Department
		Real-time	high	high	medium	low	high
Mobility demands	Mobility	medium	high	low	low	medium	medium
	Individual	high	high	low	low	low	medium
Complexity of implementation		low	low	high	medium	medium	medium

According to the evaluation table above, which gives a comprehensive consideration of current resources of enterprises, priority and key department of implementation of enterprise's mobile informatization is proposed. Generally speaking, most enterprises would choose dairy office working and marketing department with low complexity of implementation and higher mobility demand as a starting point for mobile enterprise applications. Secondly, in accordance with the effect and feedback of implementation, mobile application could gradually be applied to supply chain, purchasing department, in which demand of mobility and complexity is medium; Finally, the whole enterprise will reformed by using of mobile information technology, so that all departments, all businesses can take advantage of mobile technology to get highly effective and real-time information acquisition and processing, that is, realize mobile informatization in whole enterprise.

C. Analysis of Specific Business Processes in Enterprise to Determine the Operational Implementation Path

The purpose of this level is to analyze business processes in enterprise, and determine scope and implementation path of business process reforming by mobile informatization in accord with the actual condition of enterprises.

At this level, analysis focuses on the difficulties of development and implementation for specific business processes, some businesses can be carried out and implemented in current informatization environment, but other businesses are dependent on a higher level of informatization which need large-scale transformation; and there are some of applications which are hard to develop because of lacking technical strength, but there are other applications that are very simple. Such as remote accessing, e-mail and related applications are easy to develop, but others enterprise applications like ERP and CRM are difficult to develop and implement due to particularity of every enterprise. So we can determine the

implementation path and key of business by in-depth analysis and a comprehensive consideration of demands and developing difficulty of process in enterprise.

At last, the paper takes a pharmaceutical enterprise's mobile application as an example, which uses three-tier analysis method called IEB which is put forward above to determine its informatization path and strategies.

First of all, pharmaceutical industry can be ranged adaptive industry according to its characters, it can be profoundly transformed and improved by wireless network, but the pace maybe slowly, so mobile office applications for staffs such as mobile email and mobile office automation system, which are easy implemented, are adaptive at the first. Then some supportive mobile applications for customers can be extended gradually, which will enhance flexible and adaptability of organization quickly, shorten distance between market and customers, connect "Information Island".

The second step is to focus on enterprise internal department. According to evaluation table, marketing department is most urgent for mobile demands in current circumstances, and the complexity of implementation is not high, most important is that existing information systems and technology strength in the department are enough to support new mobile applications. Therefore, mobile informatization in the pharmaceutical enterprise should be implemented in marketing departments at first, and then be extended to purchasing, logistics, finance and other departments gradually.

Finally, determine the scope and implementation path of mobile informatization by analyzing specific business processes in marketing department. Through practical enterprise investigation of marketing department, there are some problems as follows: far away from market, information transfers slowly, so headquarters can't get accurate and timely market data; enterprise don't understand customer needs; marketing expenses increasing; region markets or branches of company lack

of coordination; every salesman possess customer information exclusively and trade transparency is low, so can not eliminate the incidents of misappropriating payment for goods and job hopping exist in sales staffs [7].

Thus marketing department should equip with mobile terminals for each customer representatives and sales staffs, and develop and implement mobile customer relationship management system (M-CRM), so either enterprise or sales can acquire and process information real-timely. The main functions of system should include: mobile data collection, mobile information inquiry, mobile sales management, personal scheduling, message automatic notification system and so on.

According three steps of analysis above, ultimately, implementation path and strategy of mobile informatization in pharmaceutical enterprises are formed. This enterprise should firstly implements Customer Relationship Management System which is most important at present, and provides some supportive applications which are easy to implement, such as Mobile Office, Mobile Email and so on, those can not only enhance flexible and adaptability of organization quickly, shorten distance between market and customers, but also provide experience to the follow-up complexity mobile application. After running smoothly for period of time, mobile infromatization can gradually be extended to production and financial system, and finally realize whole enterprise's mobile informatization.

V. ENDING WORDS

The continuous development of informatization technology and mobile terminal devices make us be increasingly aware of the temporary mobile era. Although current enterprise's mobile informatization is still not mature enough, it has become an irresistible trend and changes the survival way of customers and also the operate mode of enterprises. Mobile Informatization

utilizes mobile terminal's characteristics of real-time, mobility and personal so that enterprises will be able to access to information resources anytime, anywhere, which makes business activities be simpler, efficient, reliable, and better meet the increasingly diverse and personalized needs of consumers. This greatly enhances the operating efficiency and effectiveness of enterprises.

So enterprises must keep up with mobile trendy and development of new technology and applications, take reasonable and orderly implementation path of mobile informatization through in-depth analysis and evaluation of industry, enterprise and business process, so as to gradually improve the level of mobile informatization and enhance enterprise's competitiveness.

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