Research on Enterprises Process Reengineering Based on Informationization Stage Model

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Abstract:
Information technology has been considered as both a strategic catalyst and enabler of business process reengineering. To discusses the opportunities, policies and contents of the process reengineering bases on informationization stage model. This paper studies informationization stage models of former scholars, presents the enterprise informationization stage model in IT ages and analyzes each characteristic of one of its stage.

Keyword: enterprise informationization; stage model; process reengineering

1. Introduction

Business process reengineering (BPR) was presented by Hammer (1993) and Champpy (1993) in their literatures. In order to adapt the new cosmopolitan competition environment in the information technology epoch, enterprises must discard the traditional operating patterns and working methods, take new business and pattern in which workflow is the center and re-design the management. This new thinking shocked the management domain. The application of information technology raised the speed obtaining the data, and got convenience in collecting and analyzing the great deal of data. It also helped corporation taking science normative procedure and method, increased the decision-making efficiency and effectivity, shorted task period, and improved the business quality. Since then "business reengineering", "process reengineering" have became the hot topic of the enterprise and hot research of the science.

Reengineering got the high value in the enterprise of America and Europe. So did in domestic. The enterprise process reengineering obtained success in some case but at the same time, failed in others, it was not a miracle drug that guarantees to cure all diseases. Many scholars discussed reasons of the high failure rate.

Because the information technology was the core motive of the enterprise process reengineering, This paper thinks that the success of process reengineering was closed with the level of enterprise informationization based on constructing the enterprise informationization stage model in IT age. at the different stage of enterprise informationization, the opportunity, strategy and contents of the process reengineering are also different. It’s the key factors to distinguish its difference.

2. Enterprise informationization stage mode in IT age

Scholars which were abroad and in domestic carried on the research on the field of enterprise informationization stage model, many models were present. The most classic stage models were Nolan’s(1973) four stages model and six stage model(1979) Synnott’s(1988)four stages model, Mische’(1990) four stage model and others models in China. But with IT develops quickly, IT period renews acceleratedly, some models are not fit the actuality of the modern enterprise informationization development level. Some models design with bugs. Owing to this, this paper puts forward a stage model of modern enterprise informationization in IT ages.

2.1 The stage model of enterprise informationization

The stage model of enterprise informationization shows on figure 2-1, in the X vector direction, the enterprise informationization processes is divided into four stages:

T1: foundation application phase.
T2: application integration phase.
T3: corporation integration phase.
T4: social integration phase.

The different degree of manager stressed, capital investment, development policy of each enterprise, the time of each informationization phase were different. In the Y vector direction, it is an effectivity curve of enterprise informationization. The effectivity of information technology increases with the enterprise informationization development, The applied scope of its also spreads, and the enterprise gets more value.

F(t): Application Effectivity Function.
U: Application Effectivity of Information Technology.
T: Phase of Enterprise Information Development.

Viz. U=f(t), t>0 U is a increasing function.

2.2 Distinct criterion of the model

When study the informationization stage model, some scholars divided it according as the input and the effect of information systems, such as Nolan, Mische, Nagy Hanna; some scholars divided it according as the kind and the bound of information systems, such as Edworthy[7], Chang chegsuo, Zhu lixin[8] etc. In this paper the scope of application of information technology and the application effect of information technology is just a positive variable and a character, nor a classified basis. In order to find the classified basis of characteristics of informationization, the objective of the informationization must be concerned about, the data share and the high integration of logistics, movements of funds, and information flow are the objective of enterprise informationization. Thus the degree of integration of information technology and share of the data as the classified basis of the stage of informationization is more appropriate.

2.3 The characteristic of each stage of the model

Basic application stage (T1) is the stage of using computers to replace manual operations, is the applications local oriented and departmental oriented, such as office automation operation oriented and the computerized accounting affair oriented and Computer-aided design oriented, which is the starting point for the application of information technology. The application of this phase is mainly about department level, little of application integration and data sharing are involved. In this phase all systems which can accommodate the management needs of the business for a short time are independent of each other, but for the independence of data storage, heterogeneity of operating systems and databases, incompatibility of production, management, distribution and other nodes of the company, the information flow of the various departments is separated each other, the serious "Information Isolation Island" will be occur. The result is the larger of input of hardware and software, however, the lower of the rate of return on investment in information technology.

Application Integration stage (T2) is a stage that enterprise start to concern about "Isolated Islands of Information", the integration of interface, data, function were made to integrated, So Enterprise Information Systems of departments which utilize isomorphic or isomerous software and hardware can achieve the inter-departmental information sharing and operational synergies. At this stage, it also can
achieve the integration of capital, material and information by using computer and internet technology, all the business activities of the enterprise link together which can eliminate internal “Information Isolated Island” and then the efficiency of resource allocation and market competitiveness of the enterprise would be improved.

Enterprise Integration stage (T3) is the stage in which business process work together between corporation. In the enterprise the management based on the functions of the department is totally replaced by the work based on business process, shortening the production cycle according to the various production processes, increasing the controlling of product quality, improving the rate of products delivered on time, reducing production time and lowering production costs on the basis of quality assurance. Outside the enterprise, the integrated supply chain system were formed with the vendors, distributor and users, supply chain system and the production process control automation are integrated, the enterprises would achieve an integrated operation and get convenient in e-commerce, communication, electronic publishing and video conference and so on.

Social integration stage (T4) is the stage which information share is attained among the various sectors of society. The enterprises which leading by e-commerce comes into being a new business model integrated enterprise product design, production, marketing. With the value chain form, the enterprise keeps closely with collaborator(business partners, banking, taxation, customs, etc.) and makes a real-time interaction, nimble, combining the virtual reality system. The enterprise in this stage has became a considerable degree of maturity in the following aspects: network platform, the business processes, business model and the business environment. A network platform supported by intranet and internet provides a strong technology base for corporation. In the e-business processes, information flow takes the leading position, the flow of capital and information consists with each other. B2B, B2C, C2B, C2C and other e-business models were completely applied in forms. A relatively complete policy, laws, standards safety rules are designed by government. Which standardizes the enterprise behaviors and provide a good external environment.

3. Business process reengineering base on the model

The main purpose of Business Process Reengineering (BPR) is to improve the customer satisfaction and to raise the value of enterprise, It is a kind of management thought. According to many domestic and foreign data, more than 70% of BPR projects failed, so it is not suitable for each enterprise, the BPR implement accompanies with huge risk[9]. An analytical tool developed by Nolan. Norton Company(1993)[10] which could analyze the needs of reengineer and readiness of organization is good use for reference for enterprise business process reengineering. In this thesis the reengineering is considered according to the degree of the application of information technology in enterprises, that is in different information stages, the opportunities, strategy and content of Business Process Reengineer varies, and related content of the information technology investment are also different (Table 3-1).

<table>
<thead>
<tr>
<th>BPR stage</th>
<th>foundation application phase (T1)</th>
<th>application integration phase (T2)</th>
<th>corporation integration phase (T3)</th>
<th>social integration phase (T4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>opportunity</td>
<td>poor</td>
<td>good</td>
<td>Better</td>
<td>ordinary</td>
</tr>
<tr>
<td>Strategy selection</td>
<td>Process Improvement in departments</td>
<td>Reengineering of business process</td>
<td>Optimizing of business process</td>
<td>Appropriate adjustment</td>
</tr>
<tr>
<td>Range of BPR</td>
<td>The process in departments</td>
<td>The process in the enterprise</td>
<td>The process between enterprises</td>
<td>The process in related department</td>
</tr>
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<td>related fields of</td>
<td>OA, Department applications</td>
<td>MRPII, ERP, DSS</td>
<td>SCM, CRM</td>
<td>Electronic government</td>
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<tr>
<td>Information technology</td>
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In the foundation application phase, because of the lower level of informationization, the application is just in local or in department, systems which lack communication and data are independent of each other, little impact for enterprise is made by informationization. So the opportunity of Business Process Reengineering at this stage is not good enough, we can only do improvements of partial process in department of enterprise.

In application integration phase, enterprises achieve the integration of flow of capital, material and information, and link all aspects of the entire business. The application of information technology is gradually emerging, and having good effects on the organizational structure and business. In order to meet the integration needs of all sectors of business activities, it is necessary to restructure their businesses and starts BPR. So at this stage, it is the best chance to implement process reengineering. The entire enterprise is the scope of the recycling process, and re-designing and re-carding the process is the strategy.

In corporation integration phase, Enterprises achieve integration in business operations. Enterprises, suppliers, distributors and users form a supply chain; implement a software-based e-commerce platform. It's a better time for Business process reengineering. In content, it concerned about the business processes between enterprises, such as processing orders, supply, transportation and funds to pay for. In strategy, not a re-design process, but the optimization in the supply chain using system method. The associated field with the information technology is SCM, CRM and e-commerce.

In the social integration phase, it achieves information-sharing among the various sectors of society and enterprise. In this phase various collaborators (business partners, banking, taxation, customs, etc.) work closely together leading by e-commerce. Information-oriented, capital flow, information flow and logistics basically the same, mobile value-added, formed the business model for social integration. In this stage, the strategy of business process reengineering is aimed at optimizing the flow of information. In the recycling process, it is concerned about only part of collaborators and other related processes, and less involved in the key processes. The informationization related areas of Business Process Reengineering are electronic commerce and electronic government.

4. Conclusion

Business Process Reengineering brings new management ideas, and creates endless benefit for a number of enterprises. However, BPR is not a panacea. When reengineer the process, we should give full consideration to the reality of the situation and information technology enterprises in the application stage. Different capacity of enterprise, different initial conditions, the timing of business processes reengineering, the strategies and content are inevitably different. Based on the study of some of the enterprise information model stage, the information model in the IT era is put forward, and the characteristics of the stages are analyzed. At the same time, for BPR is closely related to information technology, the timing, strategy and content are discussed based on information model, expecting to bring our businesses some benefits in the information technology and business process reengineering.

References


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