

# Study on SMEs Business Process Reengineering in E-commerce Environment

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**Abstract** –The purpose of this article is to study the concrete way for small to medium enterprises(SMEs) to reengineer its business process in the E-commerce environment. Following the organization structure design principle, the concrete countermeasures of reengineering business process are proposed from the following aspects. From the aspect of organization structure, re-integrate the existing department, outstanding information department function; from the aspect of decision making mechanism, empower to workers sufficiently; from the aspect of organization run, establish the trust mechanism, information share mechanism, principal-agent mechanism and benefit share mechanism. Finally, the validity of proposed reengineering project has been verified through an actual example.

**Keywords** –countermeasures; E-commerce; Process reengineering; SMEs

## 1. Introduction

With the electronic commerce widespread applied in enterprise management, there has been a new tendency to use the electronic commerce reform enterprise management. The electronic commerce application is not merely simply graft the enterprise service on the Internet. Enterprise should guarantee the operation flow is correct before introducing information technology. As an information technology, its application should have the destructive effect to the enterprise old work rules, its true strength is not only to do the former activities well, but also to break through some original acquiescence and prescript and create one brand-new method of work to make the management pattern connect with international convention. This is the real reason why it requests the enterprise to carry through BPR before the use of electronic commerce.

Since Hamer proposed the concept of BPR, many scholars have made a large number of studies, including modeling methods, implementation strategies. To SMEs business process reengineering, Li studied supply chain process reengineering of a small enterprise, but not general, Wu and Wang analyzed possible problems in reengineering SMEs business process, Li proposed reengineering project that focuses on three aspects of organization building, institution building and working methods feasible for SMEs informationization, Peng analyzed the necessity and critical success factors of SME business process reengineering, I.P. Tatsiopoulos

proposed a structured methodology for the evaluation of alternative Electronic Commerce technologies to be introduced into SMEs' every-day business practices, Zhang Yunbo built fuzzy comprehensive evaluation model, Liu Yuanhui proposed BPR method From organizational structure, Sun Xiaoying proposed use Entity-activity relationships to reengineering the SMEs.

Above study results only apply the basic principles of the BPR in SMEs, emphasis on the theoretical level, lack of specific reengineering methods. This paper will present the specific business process reengineering methods to SMEs in the e-commerce environment.

## 2. The present situation of the electronic commerce application in SMEs

Comparing with the big ones, the SMEs not only have the demerits such as slight size, short fund, worse product competitive ability, insufficient human resources information and laggard management, but also have the predominance such as young, flexible operation mechanism, market vigor and specialized production. They are important constituents in national economy.

According to the data in 36th annual meeting of World Entrepot Association, SMEs make 60% contribution to GDP, 68% to export total value, 69% to import total value, 40% to revenue in China. There are 3.65 million SMEs and 2.8 million individual businesses in China, which occupy 99.6% the sum of enterprises. They have

many advantages that the big ones can not compare with, such as absorbing labor force, flourishing economy, low enter barrier in new industry. Therefore, SMEs must sober and objectively analyze their own superiority; the opportunity and the challenge that provided by globalization and strengthen strong and avoid weakness, participate in the competition positively, and strengthen own core competitive ability. But, the general level of the electronic commerce application in SMEs is low in China. According to statistical result, only 10% of the domestic SMEs basically realized the electronic commerce informationization, 70% enterprise still were in the step of study and fumbling, 20% enterprise just constructed a website on the Internet and made the advertisement. Limited by management idea, operating condition and staff quality, most of SMEs lack information technicians, purchase ability is limited and the use environment is worse. Not only the internal network are not totally realized, but also the advanced manufacture technology and the information technology are seldom used in the business process.

### 3. Strategic construction for to realize BPR under d-commerce environment

From the strategy point of view, BPR should focus on long term, the overall situation and relationship among connection movement and development. Face to the undetermined department function, the short process chain and the short of resource, the problem is how BPR should design its core business flow. Enterprise is an open system in the changing environment, therefore BPR should set up its strategy according to the environment and the characteristics of SMEs.

#### 3.1. Reestablish The Interior Function Department

Under the electronic commerce environment, some traditional departments should be cut off and some traditional departments will transfer its center on net and some new departments will appear in the enterprise. For example, for the existence of Internet, information center will become the important department because of the high importance of discriminate and dispose information. We should establish a special department to build and manage enterprise's website because the connection with outsides, company visualize and service quality become more and more important. As for the traditional production department, it will focus on customers and achieve AM, Customization Manufacturing, and stride space-time manufacturing with the aids of Internet and Intranet. The collaboration between departments in production system and between production system and sale system will make production and sale more effective and more abstemious and realize management modernization. And the existence of Internet makes it possible to eliminate space with time, that is, realize zero stock by accurate and fast information circulation.

#### 3.2. Moving Down Decision-making Point

Under the electronic commerce environment, enterprise's organization mechanism response to the market demand must be quick, exact and good. SMEs in our country have the point of centralization of company power and the business status relies on proprietor's quality and experience. The proprietor's business idea and decision-making ability influence the enterprise's business strategy directly. In this kind of situation, the executor, inspector and decision-maker in most of enterprises are separated strictly. It is an assumption based on tradition, namely the workers have not time and no willing to inspect the process and they have not enough ability to deal with their information knowledge self. This assumption forms the base of pyramid management model. Showed in fig. 1.

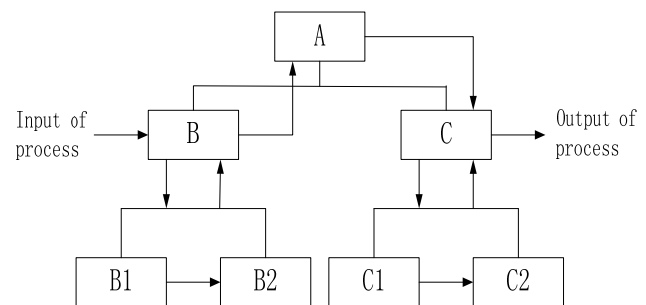


Fig.1 Pyramid Style Organization Process Chart

To locate the decision-making point at the executing place through control program in the business process is the key point and the difficult point. Bring information processing into these information practical works is the most important job. That's to say let the bed staff complete the information processing work themselves and let them self-control and self- decision and optimize the entire process to the mechanism that don't need to rely on proprietor.

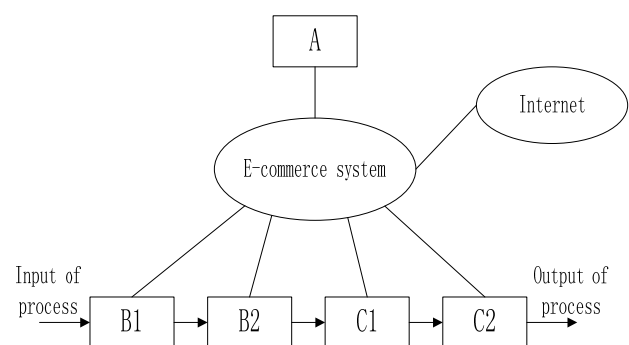


Fig.2 More Effective Organization Process Chart Under the E-Commerce Environment

Characteristics of this organization structure(fig. 2) are shown as the following:

- 1) The organization of the enterprise shows a flat style, the number of the intermediate managers will be reduced and more effective.
- 2) As a result of existence of Internet and Intranet, there are more communicate opportunity for ion to top-managers and base-managers, this enables the

organization structure gradually to favor the distribution and the network.

3) Under the electronic commerce environment enterprise structure will be able to achieve centralization and decentralization, the balance between stability and flexibility, and then, exert the superiority of the overall system.

4) A new Enterprises' Organization form called Virtual Enterprise can be formed. This kind of structure can keep single enterprise's flexibility and independence and integrate the former dispersive factors such as technology, human-resource and management into one effective and fast system.

### **3.3. Rebuilding the Organization Operation Mechanism**

With the development of productive force and intense competition, the enterprise will remain invincible in market only by establishing stable supply-chain alliance. To SMEs, it is a worth researching problem that how to enable them be a stable node in the supply chain which means to be accepted by a supply chain alliance and cooperate with upstream firms and downstream firms. To solve this problem, the author thought SMEs should rebuild the organization operation mechanism as the following:

#### **3.3.1. Establishing trust mechanism**

The supply chain cooperation relationship is formed in the environment of integrative supply chain union and forms between ones with specifically aims behalf. The cooperator in a supply chain would not foresee the future fully and subscribe contract in the market environment which the chance written in water. In building supply chain strategy alliance, the cooperation based on trust is the essential idea and the trust mechanism is the basic of realizing the supply chain conformity and cooperative operation. In the famous "Prisoner's Dilemma", the two prisoners can only get rewards simultaneously under the condition of trust. In the process of supply chain conformity management, trust is one kind of strategic resource, it can effectively promote the division and cooperation, reduce the transaction cost and strengthen respective core competitive advantage.

The trust mechanism establishment, the trust relationship continues and development should based on Common Vision. First, choosing the point to cut into and appealing along a common value master line. The company can establish common value chain and enterprise trust and cooperate relationship by do SCORE. In addition, the union member's honest cooperation, the opening communication and the together question solution are the basic prerequisite.

#### **3.3.2. Information sharing mechanism**

In order to make the supply chain synchronization, the frequency of information alternation among supply chain enterprises is much more than that of traditional ones. Therefore, we must change the point-to-point information communication way under the traditional chain feedback mechanism and change serial structure into parallel structure information communication process and establish network information feedback mechanism. By establishing unified information sharing network platform, omni-directional network information sharing can be realized which provides a highly effective information communication and harmonious cooperate operation environment for the main body of supply chain alliance. Thus, the pitch point enterprise may make accurate and quick decision about production and stock according to its downstream firms' ordering information and consumers demand forecasting information. This is good to the whole supply chain to realize JIT purchase, JIT production and JIT delivery.

#### **3.3.3. Principal-agent mechanism**

From one point in multi-echelon supply chain, information asymmetry exists between the supply side and demand side in supply chain. On the one hand, the upstream supplier may make wrong service commitment because of the lack of certain ability to provide some kinds of services. The downstream ones and some customers with poor information can't recognize supplier's ability and make Adverse Selection. On the other hand, for lacking the active oversight, the suppliers maybe not take the whole supply chain benefit maximization but its own benefit maximization as the standard and adopt deceitful behavior, namely existing Moral Hazard problem. Obviously, the relationship between supplier and customer shows the dissymmetry and the imperfection of contract. The relationship between the two sides has strict Principal-agent relationship in economics. This determines that building supply chain alliance is a behavior of " nonzero and cooperate games". SMEs can research the relationship between the node enterprises in supply chain based on Principal-agency theory and build the restraint mechanism urge all of them abide by their commitment. They can design supply chain contract and arrange system by some invigorative ways and castigatory restrict methods such as sharing the risk, giving prices discount, increasing the order batch flexibility, income sharing and benefit compensating, etc. The moral risk of hidden action and information by eliminate the client (generally is manufacturer and core enterprise), worried agent (generally is supplier or dealer) make the agent pursue own effectiveness maximization at the same time promote the Principal's benefit maximum, that is to say, realize the benefit uniformity on both sides.

#### **3.3.4. Income sharing mechanism**

The partners' fair sharing of the exceed repayment should be realized by clearly marking the value and benefit gained by reducing the cost and the stock and using resources highly effectively.

## 4. The case analysis of BPR utilized in SMEs

### 4.1. The Situation of BS company Before BPR

BS Company is a medium-size private company whose business is machine-finishing, which means it takes external cooperation task from other companies. It was established in 1900, heretofore, the year turnover approximately is 50 million RMB, the number of staff is about 280 and it has machine-machining workshop, operation department, storehouse management department, finance department and purchasing department, etc. The production process type is small batch and multi-varieties, namely put up immediate production according to the order's technical requirement and generally does not have massive repeated production and little stock.

In early time, the company is small and business is simplex. Various departments' horizontal function and the differentiation degree of production process are not obvious. There isn't too many interdependent and uncertain questions and the staff mutual recognition degree is high, the illegibility is low and the degree of privities among the staff is high. It never has fault situation in product quality and delivery time after getting an order from a customer. Along with the business growth and expansion, the volume of company interior information processing and the degree of business complex are increasing. The interdependent uncertainty and illegibility between internal members begin to upgrade. The company establishes a list as the main mechanism among the various units. The business process is shown in fig. 3.

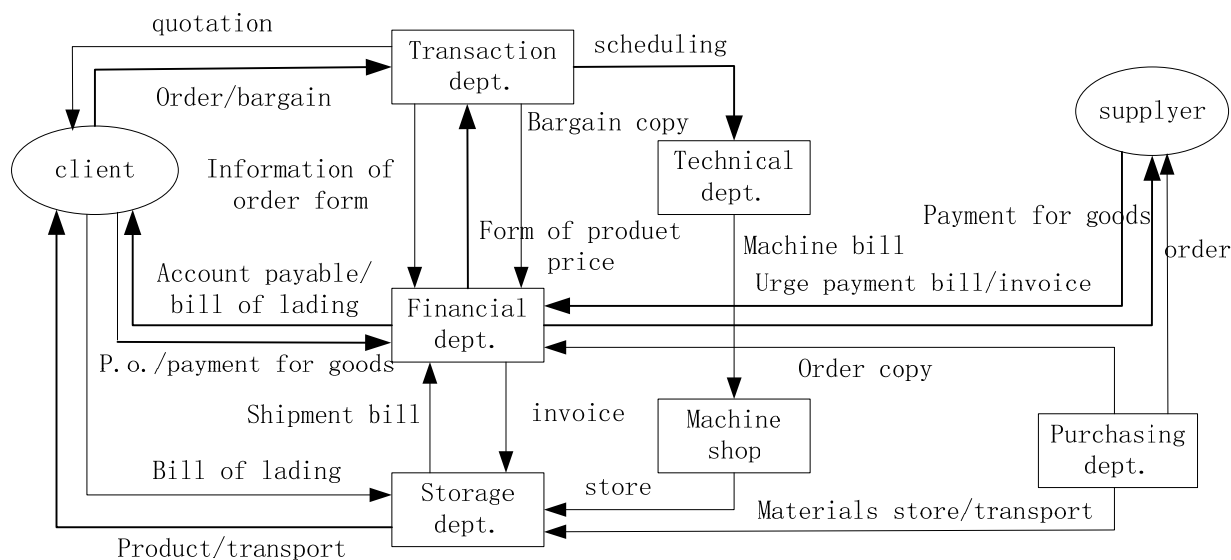


Fig.3. The Business Process Before BPR

The client need negotiate with transaction department, storage management department, finance department and transportation department and need to deal with various bills and documents, such as order intention, quotation, bargain, account payable, bill of lading and invoice, etc. The process is very trivial and lead time is long. It is very inconvenient for the client, which may result in client losing.

### 4.2. New Process Design

Facing this situation, the BS decision-maker decided to carry through BPR and redesign contract by information technology to fit for the new process in e-commerce environment. The process is shown in fig. 4.

This process has the characteristics as follow.

#### 4.2.1. More rapid response to the customer

Merge different duties and works in the past. For instance, in the past, to sign a bargain must through the following steps: order intention→quotation→bargain. Because of the particularity of machine-machining department, transaction department can not quote immediately. It can only quote after finance department check the cost of the sample. This kind of bargain spends 2 days at least. Therefore, BS set up a special bargain process team that is responsible for bargain signing. The members come from transaction department, finance department and technical department and unrenegade form is adopted. It introduces advanced CAD/CAM, simulation system and cost estimate system to work in flow operation to save time and reduce management cost. This process reduces the lead time from 2 days to 30 minutes and improves working efficiency enormously.

#### 4.2.2. Down moving and dispersing the decision-making point

The BPR simplifies the process not only on horizontal aspect but also in vertical aspect, that is to say, the team members have the responsibility to entire process, thus they have decision-making power to the process.

#### 4.2.3. Using parallel process to exceed organization boundary

In the traditional process, we must start each step after the previous one is finished, but after BPR, we can dispose certain process parallelly. In e-commerce environment, the realized information sharing makes it

possible for marketing people to start the production's technical design after they collect enough information, instead of starting it only after finishing all the market research. This makes many work processes at the same time and saves a lot of time that has been loosed between two steps before. In most SMEs, at present, most works are composed of several continual parts, but these parts execute by several independent departments separately.

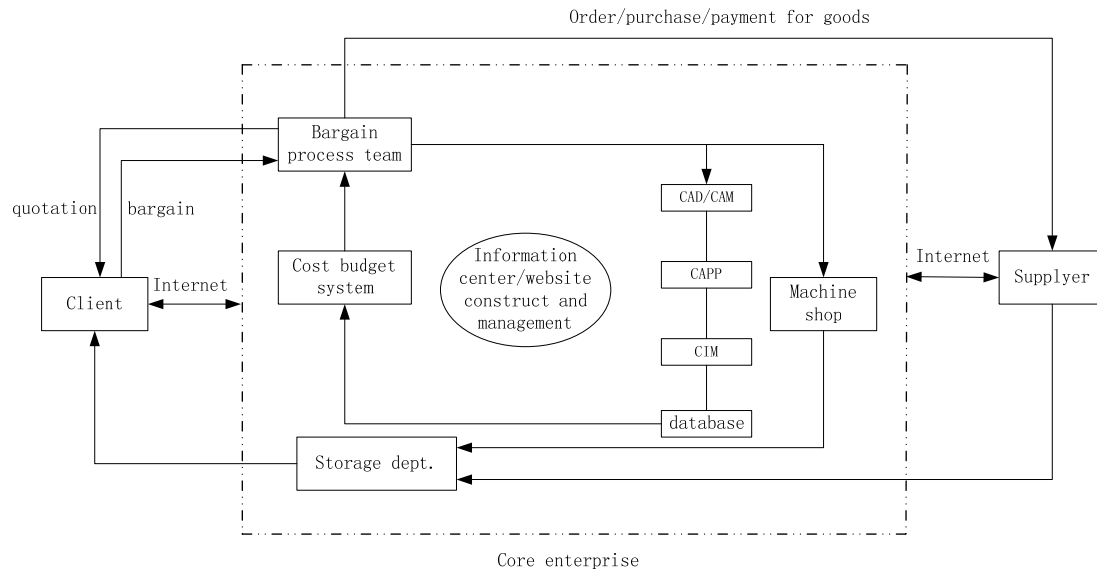


Fig.4 The New Process Based On E-Commerce

After BPR, the works may transform surmount the organization boundary, each work carry on in its most significant the place, thus save the time and reduce the cost.

#### 4.2.4. Using information technology to establish standard operational procedure and reduce the inspection and control

BS has established MIS in the whole company scope and has realized information sharing among departments. The decision-maker can have all of departments' information simultaneously and make it possible to synthesize using the centralization and power-dispersing system. It has established the standardized procedure and stressed the standard request in business processes time and way by information technology. This standard operational procedure is the enterprise activities' important benchmark. The significance is not on providing reference to operation but is propitious to reasonable thinking in making flow. BS also corrects its standard operational procedure regularly to fit the market, with the unceasing mutative competition environment.

## 5. Conclusions

The e-commerce creates lots of opportunities for SMEs, at the same time, alters the way of business operation. The BPR is the only way to carry out e-commerce to SMEs. It can only be successfully used in SMEs under the condition that significant rebuilding and innovation are

made in organizational structure, decision-making mode and supply chain management.

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