Thinking on the Equipment Acquisition Process Reengineering

Xi Li and Zhuang. Chang
Academy of equipment, Beijing, China
Email: {Juice758530, Changzh_study} @163.com

***Abstract*—Business process reengineering is to redesign the key work or process of the enterprises. Analyze and summarize the theory or the experience of the business process reengineering, put forward the thinking of the equipment acquisition process reengineering, and then discuss the use of the equipment acquisition process reengineering, finally analyze the process of implementation, and also the characteristic of the new equipment acquisition process.**

***Index Terms*—equipment acquisition, business process *reengineering,* equipment acquisition process reengineering**

I. Introduction

As information technology continues to develop, the world economy has entered the information age, and is moving toward the direction of globalization steadily. In this trend, the last operating mode limits the development of enterprises. To reduce costs and remain competitive, enterprises began to change philosophy, and to reform the traditional organizational structure and business processes, business process reengineering (BPR) booms gradually. Equipment acquisition departments and manufacturing units conform to this trend, began to conduct business process reengineering, which targets are to reduce production costs, improve application efficiency, thus it triggers the thinking of equipment acquisition process reengineer.

II. The Connotation of Business Process Reengineering

A. Business Process Reengineering

Defining the business process, domestic and foreign scholars expand all around six process elements: input resources, activities, structure, output, customers, and value. American scholar Hammer considered business process reengineering as "fundamental business processes of the enterprise rethinking and radical redesign, which is to gain significant improvement in cost, quality, service and speed and other aspects". Business process recycling "should not just simply automate the existing processes, we should forget it, and begin the new design, because the existing process is full of errors" [1]. Business process reengineering advocated business processes as the center, according to the tasks of process required form the functional departments. It is a systemic mode of thinking, uses the goal-oriented process performance metrics and overall optimization methods, and pursues the maximization of overall value added instead of a single optimal links and job tasks; enterprise business process reengineering advocate customer-oriented organizational change, its essence is to use the information technology for innovating the organizational management and operational processes, and it is the process of merging information technology and organizational management together [2]. Generally speaking, business process reengineering includes four core ideas: First, reconsider basic problems; Second, completely redesign the process; third, the new business processes is remarkable; Fourth, focus on the most important elements of the process.

B. Equipment Acquisition Business Process Reengineering

Existing equipment acquisition business process is built on current equipment acquisition management system, and it is relatively reasonable. As the development of information technology and the reform of equipment acquisition system boost gradually, the existing process has been unable to meet the requirements. According to the business process reengineering theory, equipment acquisition business process reengineering, should be thoroughly equipment acquisition process reengineering, it is a fundamental reform of existing processes, and its purpose is to make equipment optimized in cost, productivity, quality control, producing schedule, and performance aspects. Equipment acquisition business process reengineering is a systematic project, it does not only optimize the traditional equipment acquisition processes organizational structure, but also transforms the single line into a parallel workflow with information technology, thus establishes the operating mode which corresponds to the long-term equipment acquisition development requiring [3]. Equipment acquisition business process reengineering, makes equipment acquisition decision-making department drafting the relevant measures and methods are more accurate, which breaks the ice between different acquisition units, promotes the interior information exchanging, improves the enthusiasm of operational staff, and makes the equipment life-cycle management is more reasonable. Equipment acquisition business process reengineering reduces the cost of equipment development and production, and improves efficiency.

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III. The Characteristic of Equipment Acquisition Business Process Reengineering

In the condition of information technology, after carrying out the business process reengineering, the equipment acquisition business process should be with the following characteristics:

1) Strengthen the extensive application of modeling and simulation technology. The main results of equipment acquisition activities will be validated virtually by modeling and simulation technology, which ensures the quality of equipment acquisition activities.
2) Widely use the virtual organizations, concurrent engineering and other theoretical approaches, which simplify the equipment acquisition organization and management procedures, reduce errors, shorten cycle, improve quality and efficiency, and ultimately improve the economic efficiency.
3) Strengthen the equipment acquisition feedback loop, which not only ensure the combination of all aspects of equipment acquisition, but also ensure the mission requirements, equipment requirements, technical solutions, design, and process plan are fully implemented, finally make the equipment development, production, and using meet the requirement of army training and fighting.
4) Use the method of combining virtual test and the real test, which not only reduces the workload of test equipment, reducing test costs, but also improve the scientificity of experimental verification.

IV. The Implementation of Equipment Acquisition Business Process Reengineering

Implementation of equipment acquisition business process reengineering, in general, should be made important progress in the following areas:

1) Improve the efficiency of information transferring in inter-departments which participate in the equipment acquisition activities, the management department could develop more accurate and effective decision;
2) Decrease the equipment acquisition barriers between the internal members; reduce the degree of bureaucratic;
3) Break the constraint of the old rules; encourage the enthusiasm and creativity of participants;
4) Make the product quality control be more reasonable. Therefore, the implementation of equipment acquisition business processes reengineering should comply with the following principles and ideas:

A. The Principle of Implementation

The first principle of business process reengineering is top-down design and bottom-up of the implementation, and equipment acquisition business process reengineering should also follow the top-down design and bottom-up implementation principle [4]. There are five principles when implementing:

1) Establish effective leadership mechanism during the system planning, such as set up special leading group or offices;
2) Understand and participate the specific work when equipment acquisition business executive staff take part in the process reengineering, and strengthen communication with each other;
3) Understand the requirements of equipment acquisition business process reengineering, seize the main problem;
4) Analyze the costs and benefits, so that the new business processes can save costs and improve efficiency;
5) Emphasis the information collection, reduce the duplication of the same information, avoid errors collection.

B. Ideas of Implementation

Equipment acquisition business process reengineering should first change equipment acquisition process management philosophy, form the new information strategy, change organization, form the new business process systems [5]. According to Grove on business process reengineering theory, equipment acquisition business process reengineering is divided into three levels: strategic planning, the generation of new processes, and using of the process to the acquisition activities, these three levels can be further divided into five stages:

1) Phase of planning. Because the possible risks of this strategic project, the implementation of BPR should be supported by equipment acquisition strategic level, and set up special leading group and executive team, and survey the status of equipment acquisition business processes of current.
2) Design phase. This phase should consider all the requirements of equipment life cycle, which is planning, development, manufacturing, testing and evaluation, validation, deployment, use, security, training and decommissioning process for all current and future needs.
3) Modeling phase. Turn the needs and requirements into the system's integrated design and then build the model.
4) BPR implementation phase. At this stage, the compatibility, interoperability and integration of all functional interfaces and physical interfaces should be realized, and ensure that the system definition and design reflect all elements of the system (hardware, software, facilities, personnel and information) requirements.
5) Evaluation and optimization phase of equipment acquisition business process reengineering. At this stage, when the new equipment acquisition business processes implemented, it should be monitored, and assess the effect of operating and implemented conditions, identify the problems

and summary these problems, aim at these problems, improve the new equipment acquisition business process, then submit the final report to the equipment acquisition strategy official.

C. Steps of Implementation

Based the five stages of the implementation summarized, equipment acquisition business process reengineering implementation steps are as follows:

First phase is the planning. Appoint the leader and establish a dedicated project team, prepare for the management staff the BPR case to obtain their support for business process reengineering project; survey the business processes of the industry status, communicate and exchanges extensively with the executives and managers in order to understand the actual business; research on related books and periodicals to understand industry trends and look for best practices; records at a high level of current processes and related data, find the gaps between current process and strategic business objective; form the preliminary list of existing problems; communicate with supervisors of the commission and key senior managers; deeply understand the process reality site or participate in academic exchanges for the new concept of process reengineering; obtain useful information from outside experts and consultants. Through these activities, the project team identify the industry's current needs and future needs, conform the main problems to be solved and the strategic direction of process reengineering, determine business process reengineering scopes and objectives, develop project plans, including short-term plans and long-term development strategy.

Second is the design stage. This phase is to conduct detailed design for business processes and organizational model. For the theoretical issues raised by last planning stage, the relevant executive personnel will summary of them, establish ideal scene which accurately describes the equipment acquisition business processes, then define the needs of information technology for new business processes and organizational structures; addition, during the design process it is important to pay attention to that as far as possible analyze the short-term results and long-term benefits separately.

The third stage is modeling. Design the organizational structure model which matched the new processes, compare this model with the running business process, choose advantages, then form the new integrated process model and define the new model, describe these processes with the flow chart and detailed define the new task roles; according to the designed process models, establish information systems that could support the new business processes to operate, and implement the small-scale experiments.

The fourth stage is implementation. This phase is mainly re-establish new business processes to match the organizational structure, communicate with specific implementation personnel about the new process, plan and implement change management plan; formulate phased implementation plan and put it into reality; draft training programs of new business processes and information systems for staff, which complete the implementation of business process reengineering.

The fifth stage is the evaluation optimization. At this stage, write the acquisition process reengineering costs and benefits analysis report, form a clear return on investment analysis report, assess the effect of the implementation, operational time, the number of information flow and other factors of new processes; assess the influence of process and organizational reengineering for specific using personnel; define key business performance index, and conduct periodic evaluation, according to the evaluation results, improve the new process continuously; submit final reports to the project management personnel for accredited.

V. The Conclusion

The theory of business process reengineering from be proposed to be accepted now in enterprises for more than two decades, but in the field of equipment acquisition is still a new theory, and the implementation of equipment acquisition process reengineering conforms to the developing trend of equipment acquisition with information technology. Based the business process reengineering theory and practical experience, form the following points of implementation of equipment acquisition business process reengineering:

First, the information technology is a fundamental power to change the business process, advanced information technology support equipment acquisition business process reengineering, without information technology, process reengineering could not be carried out smoothly, design and model phase of reengineering will not develop fluently, the information technology is an important guarantee of process reengineer. To promote the smooth implementation of BPR, it should balance between the new processes and the information technology.

Second, the equipment acquisition business process reengineering theory itself is not perfect, the use of relevant theories and methods as well as model building also not mature enough to implement, there are still many problems in practice, the immaturity of theory will bring difficulties to the implementation of equipment acquisition process reengineering. There should be correct theoretically understanding of business process reengineering, which need to focus on the aspects of integrating with management theories, such as concurrent engineering theory, information management theory, total quality management theory and so on. To make sure the equipment acquisition business process reengineering develop effectively, we should understand the connotation of equipment acquisition business process reengineering theory correctly, and constantly learn and explore in practice.

Third, the implementation of equipment acquisition business process reengineering is an evolutionary process, and also it is a concurrent engineering which need evaluation and optimization at the same time of transformation, therefore there should be integrated

control and evaluation systems in this process; in the meantime, this process should combine the equipment acquisition strategic planning, ensure does not occur problems in every aspect of the acquisition business process reengineering, which is very significant to improve the efficiency of equipment acquisition, and promote the development of equipment acquisition with information technology.

REFERENCES

[1] Y. S. Fan. "Information management strategy and methods," Beijing: Tsinghua University Press. 2008.

[2] F. X. Gao, "Information resource planning-information technology infrastructure," Beijing: Tsinghua University Press, 2002.

[3] N. Li, "Chinese urban information-based development and evaluation," Shanghai Jiaotong University Press. 2009.05

[4] X. Y. Wang, "Study of life cycle perspective based enterprise information resources planning," *IEEE Journal of Intelligence*, June 2011.

[5] Z. Q. You and S. J. Li, "Enterprise information technology theory and case," Beijing, Machinery Industry Press, June 2005.

LI Xi was born in Mianyang city, Sichuan province, China. She graduated from Academy of Equipment in 2003, and she also had her postgraduate degree in equipment acquisition at the same academy in December, 2008. Since 2010, she has studied for her doctor degree in equipment acquisition at Academy of Equipment in Beijing.

She worked in Academy of Equipment after graduated as an Assistant Teacher from 2003 to 2006, after she had her postgraduate degree, she worked in the same academy as a Teacher during 2009, and she delivered the paper of "The new thought of U.S. military performance based services acquisition" in *China Government Procurement*. Now her current research interest is the development of equipment acquisition with information technology, and previous interest is the regulations of equipment acquisition.

Chang Zhuang was born on April 9th 1982, in Miluo County, Hunan Province, China. He was award the marine and equipment engineering Master's degree at Navy University of Engineering in Wuhan, China, at December 2009. And he now is a researcher studying for a Doctor's degree in equipment management at the Academy of Equipment in Beijing, China.

He has been almost engaged in equipment researches for 10 years. His researches include Integrated Warship Damage-Control Training Systems, Decision Fusion theory for Multi-source Remote-Sensing Information, Green Procurement of weapons and equipment and so on. Currently, He is doing researches in equipment trainings.