

# On Bill of Knowledge Resources during ERP Implementation

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**Abstract.** It is the key of whether the ERP system can be applied successfully to definitude, organize and manage the knowledge resources during ERP implementation scientifically. In this paper, we use the analyzing method of project management to formulate the basic plan of ERP implementation. Based on that, we analyze the required knowledge according to the phases of ERP implementation, elaborate the knowledge from many angles, and form the bill of knowledge resources. This will help enterprises to make the knowledge resources plan during ERP implementation, guide their practice, and increase the success rate and efficiency of ERP implementation.

**Keywords:** *Enterprise resource planning, Knowledge management, Project management*

## 1. INTRODUCTION

ERP (Enterprise Resource Planning) is an administrative thinking and method of modern enterprises. It is market and customer demand-oriented, to optimize resource allocation and eliminate all the null and void labor and resources in the process of production and operation, so as to achieve the organic integration of information flow, material flow, capital flow, value flow and the business flow [1]. Nevertheless, the success rate of ERP Implementation is not very high. How to implement ERP successfully has always been a difficult problem confusing enterprises, software vendors and consulting firms.

In this paper, we firstly establish a plan for the implementation of the project mainly according to the basal processes of ERP Implementation for enterprises, using the theory of project management. Basing on that, we extract the different knowledge resources required in each stage of implementation from the perspective of knowledge management, then illustrate them from various angles, and bring forward the concept of bill of knowledge resources during ERP Implementation with a detailed plan for acquiring and applying the knowledge.

## 2. THE FLOW AND THE INITIAL SCHEDULE OF ERP IMPLEMENTATION

We usually manage ERP implementation as a project, which can be divided into two phases, the preparation phase and the implementation phase [2]. Given the implementation phase is the main part of the lifecycle of ERP implementation, we focused our study on this stage. Following the theory of project management, we set down the initial schedule of ERP implementation, as shown in figure 1. The width of the blue rectangle in the figure denotes the relative length of time, the beginning and the end of each process.

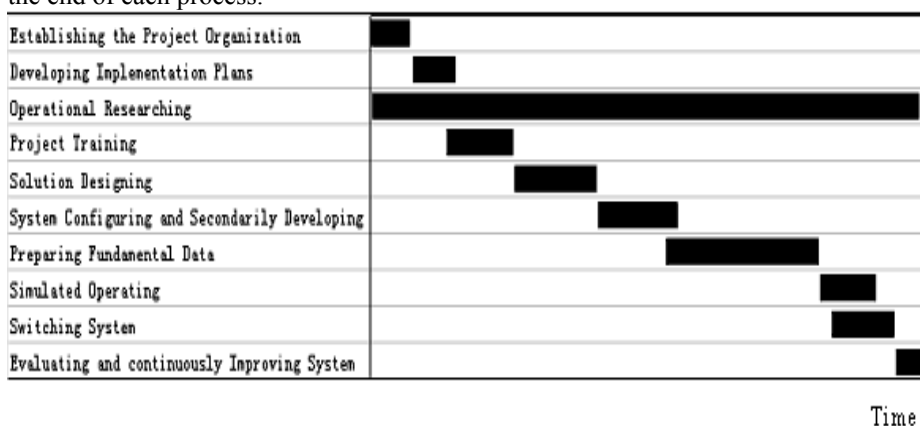


Figure 5. Initial Schedule of ERP Implementation

## 3. BILL OF KNOWLEDGE RESOURCES

Figure 1 clearly shows the key processes of ERP implementation and correlations of these processes. In the following paragraphs, we will point out the main knowledge that is required by the enterprises during ERP implementation, elaborate the knowledge from various angles of view, and finally form the bill of knowledge resources.

### 3.1 Establishing the Project Organization

According to the actions during ERP implementation, we divide the organization of the project into three levels, the leading group, the implementing group and the applying group. The required knowledge is as follows:

#### 3.1.1 Project Management Knowledge

The project management in this phase mainly involves human resource management. We fractionalize the work using the method of Work Breakdown Structure (WBS), and manage human resource according to the requirements of the

fractionized work as well as the employees' competence, which requires a project manager with rich experience.

### **3.2 Developing Implementation Plans**

In this phase we should make out the concrete plans for the following implementation. The required knowledge is as follows:

#### **3.2.1 Project Management Knowledge**

Firstly, we should definitude the object of the project and the exact implementation range. Then we can map out the schedule of the project with sufficient estimations of the changes and risks that may occur, and the consulting firm should bring forward a prevention solution. Therefore, this knowledge is partly from the enterprise and partly from the consulting firms.

#### **3.2.2 Financing Management Knowledge**

According to the initial cost and budget plan and the schedule of the whole project, we make out the concrete plan for controlling the cost and the budget. Although we can get this knowledge from books, it is impossible to master it during the short time of setting down the implementation plans. Therefore, enterprises require the accountants who have mastered the knowledge.

#### **3.2.3 Computer Software Application Knowledge**

With the help of computer software assistant tools, we can break down the work, make out schedules, manage human resource, work out the concrete implementation plans and follow up the execution. For instance, the Microsoft Project is one of the most useful tools. Similarly with the knowledge of financing management, this requires the excellent technicians.

### **3.3 Operational Researching**

Operational Researching is a process that enterprises and cooperators (consulting firms, software vendors) join together to understand the business flow of enterprises. The required knowledge is as follows:

#### **3.3.1 Human Resource Management Knowledge**

In this part, our emphasis is the investigation and analysis. We should be clear about the organizational structure, jobs offered and responsibilities of each department to make sure the following work can go smoothly.

#### **3.3.2 Business Flow Knowledge**

We should accurately identify the business of the enterprises, make the business flow clear, and collect relevant bills of document, report forms, etc. A little part of the knowledge is apparent, which we can get from books. But the main part depends on the accumulated experience of relevant staffs.

### **3.3.3 Investigation Knowledge**

We should choose the appropriate one according to the circumstances. And the execution processes require skills. Therefore, the investigators with rich experience are required.

### **3.3.4 Document Management Knowledge**

After investigations and repeated discussions with the departments, we will gain the business flow documents of each department, such as ledger, receivables, payables, assets, stocks, distributions, etc, then compile them and make reports of current business situations, in order to make good data preparations for the following work.

## **3.4 Project Training**

ERP is a normative system. However, only with our management, it can work effectively. The training has two meanings, education and exercises. The former emphasizes particularly on principles and conceptions, mainly explaining “why we should work in this way, what are necessities, what are benefits”. The later emphasizes particularly on application methods, mainly explaining “how to do”. The required knowledge is as follows:

### **3.4.1 Training Management Knowledge**

The training is supported by consulting firms and software vendors. The implementing group should be trained about the functions of the software; the applying group should be trained about manipulating techniques. At the same time, the training should be carried out step by step.

### **3.4.2 Expert's Thinking and Experience**

The experts who are invited as training instructors can pour the required knowledge and skills into relevant staffs in different degrees. This embodies the progress of knowledge transfer.

## **3.5 Solution Designing**

Basing on the third phase, an appropriate solution scheme should be designed according to the current circumstances and future demands. The required knowledge is as follows:

### **3.5.1 Organizational structure of the Enterprise Knowledge**

Enterprises should optimize and rebuild their organizational structures rationally according to the characteristics of their business, including administrative levels, business functions, etc, to make their business implementation more effective.

### **3.5.2 Business Requirements Knowledge**

In this phase, we should definitude enterprises' different business requirements, match them with the functions of the software, decide whether to make a secondary development, and form the complete solution scheme. Therefore, the knowledge we

need emphasize investigation. And we should pay attention to the accuracy of the materials.

### **3.5.3 BPI or BPR knowledge**

ERP implementation should be combined with BPI or BPR. We should build a rational and orderly administrative system, organizational structure, and working methods to operate the implementation smooth. The knowledge required is usually from consulting firms, with cooperation with the enterprises.

### **3.5.4 Professional Consulting Skills**

Implementing consultants should guide the project teams to make practical simulations under a testing environment, train all members about the application of the software, discuss the feasibilities of different schemes, and report results to the leading group to be examined and approved.

## **3.6 System Configuring and Secondarily Developing**

To install the system, the users should firstly set users' privileges and other basic information, and then secondarily develop or improve and reorganize the business process according to the designed solutions. The required knowledge is as follows:

### **3.6.1 Software System Application Knowledge**

Technical staffs from software vendors are required to assist business staffs to install the system and set parameters according to the concrete conditions of the enterprise.

### **3.6.2 Secondary Development Knowledge**

When the software and the actual situations do not match, and the former may be polished less easily to match the latter, we should secondarily develop the system. In this situation, the knowledge required is mainly from software vendors who will make specific solutions for the secondary development.

### **3.6.3 Business Process Reorganization (BPI) Knowledge**

Once small-scale secondary development of the software can not solve this problem, the business process of the enterprise should be reorganized. The relevant knowledge is mainly from consulting firms, who will guide the implementation by virtue of their experience wealth.

## **3.7 Preparing Fundamental Data**

The preliminary data preparation is a key to guarantee correct operations of the system. Relevant knowledge includes the extraction of the basic data, transaction data entry, data coding, the use of information technology tools and the progress of project management.

### **3.7.1 Fundamental Data Extracting Knowledge**

The fundamental data includes basic material information, product structure information or BOM, product process, accounting subjects, basic staff information, customer data, vendor data, etc. To avoid data leakage, the work should be completed by the enterprise itself. In addition, attention should also be paid to the accuracy and integrality of the data.

### **3.7.2 Transaction Data Entry Knowledge**

Transaction data includes sales orders, purchase orders, inventory information, financial information, etc. And these dynamic data should be formally input in the system switching stage.

### **3.7.3 Data Coding Knowledge**

Every item of data to be input into the computer should be classified and coded. Usually, this is done by consulting firms.

### **3.7.4 Information Technology Tools Using Knowledge**

Information technology tools will significantly increase the efficiency to manage the massive data. It's up to the enterprise itself to choose an information technology tool and recruit or train related operators.

### **3.7.5 The Progress of Project Management Knowledge**

In the data preparation phase, the benefit of the new system is not notable. Therefore, it should be shortened by a restraint system in the enterprise.

## **3.8 Simulated Operating**

After the customization or secondary development, a practical operation simulation is necessary, including the software functions simulation, the practical operation simulation and the parallel operation. The relevant knowledge includes system testing and document management.

### **3.8.1 System Testing Knowledge**

During the testing stage, users should hear software vendors detailing the functional parameters of the system and input representative data to maximize the testing scope of the system. At the same time, software vendors should correct the system faults arising from bugs. Therefore, this work should be completed by the enterprise with supports from software vendors.

### **3.8.2 Document Management Knowledge**

Archive the records of the simulated operation process, which can offer the basis for further improvements. Accuracy and integrity is still the basic principles in this phase.

## **3.9 Switching System**

The running of the ERP system is a switching process, during which the new one gradually replaces the old one. The required knowledge is as follows:

### **3.9.1 Switching Modes Choosing Knowledge**

According to the actual situations of the simulated operation, there are three switching ways, direct, parallel, and grading. As a highly integrated system, the direct one may be the best choice considering the integration of information. Even for the grading one, business processes should not be split to avoid destroying information integration. To ensure a smooth switching work, it should be completed under the guidance of consulting firms.

### **3.10 Evaluating and Continuously Improving the System**

After the system runs successfully and sustains a period of stable operation, we should evaluate and continuously amend the system to make it more effective. The relevant knowledge includes project evaluation and BPI.

#### **3.10.1 Project Evaluation Knowledge**

We can evaluate the operation from many aspects, such as the integration of the systems, the rationalization of business processes, dynamic performance monitoring, and the continued improvement in management, etc. What's more, as an asset of the enterprise, return of investment should be taken into account. In order to ensure the validity of the evaluation results, enterprises should hire professionals to complete the work.

#### **3.10.2 BPR Knowledge**

To improve the efficiency of the system, enterprises should firstly achieve automations with human resource liberated, and then improve its business processes, optimize them or even make some major and fundamental changes, which can be called BPR.

## **4. HOW TO GET THE KNOWLEDGE RESOURCES ABOVE**

According to Armstrong and Novins, enterprises should not only concern with the content of the knowledge but also distinguish them according to their sources and characteristics.

To enable enterprises to obtain relevant knowledge more easily, we sum up three major sources for the knowledge above, consulting firms, software vendors and enterprises themselves, and divide the knowledge from two dimensions, sources of the knowledge and steps of ERP Implementation. The results are shown in table 1.

**Table 1. Knowledge Resources List**

Knowledge Resources		Knowledge Sources		
		ERP Consulting Firms	ERP Vendors	User Enterprises
Steps of the ERP Implementation	Establishing the Project Organization	Project Management		
	Developing Implementation Plans	1. Project Management		Financial Management
		2. Computer Software Applications		
	Operational Researching	Investigation		1. Human Resources Management 2. Business Process 3. Document Management
	Project Training	1. Training Management	1. Training Management	
		2. Expert's Thinking and Experience	2. Expert's Thinking and Experience	
	Solution Designing	1. BPI or BPR Knowledge		1. Organizational Structure of the Enterprise
		2. Professional Consulting Skills		2. Enterprise Business Needs
	System Configuring and Secondly Developing	BPR Knowledge	1. Application of the Software System 2. Secondary Development	
	Preparing Fundamental Data	Data Coding		1. Fundamental Data Preparing 2. Transaction Data Entry 3. Information Technology Tools Using 4. Progress of the Project Management
Simulated Operating		System Testing	1. System Testing 2. Document Management	
Switching System	Switching Modes Choosing			
Evaluating and continuously Improving System		Project Evaluation	BPR Knowledge	

## 5. CONCLUSIONS

Successful project management and knowledge management is prerequisite to a successful ERP implementation. In the paper, we apply the theory of project management and knowledge management synthetically. Based on the key processes of ERP implementation, we list the detailed knowledge required during the implementation, and form a bill of knowledge resources. The significance of this paper lies: Through providing such a bill of knowledge resources to enterprises which need to implement ERP system, it will make them definitely understand the knowledge required during implementation. And through illustrating the relevant



knowledge from different angles, it will help enterprises fully comprehend the knowledge and apply it better, and help build the knowledge system of ERP implementation and finally integrate it into the enterprise culture, which will improve the success rate of ERP implementation and bring greater competitive advantages and economic benefits for enterprises.

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