

Construction Strategies of ERP System based on a project type: A case study

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1. Introduction

In recently, government has been supporting informational businesses to help business management for small and midsize manufacturers. The domestic small and midsize manufacturers are already maximizing their effectiveness by finding and sharing intangible value through standardization, consolidation, linking, real-time sharing of information by utilizing a measure of any management reforms. And they are setting up SW tools that are required within the company under the protection and support of the government. As a case study, firm A is a domestic small manufacturer in our nation. Infrastructure of this firm was prepared from 2010, an informational system was not built because of the critical financial status. This firm wants to manage company affairs as registration, budget, planning, ordering, entering the shed, etc for all projects, and to share business data related to the workflow. Therefore, a system that maximizes its operational efficiency through actual cost analysis and profit analysis to increase work efficiency and to minimize overlap management of business and data loss, etc is needed. In this paper, we introduce the building strategies of ERP System based on a project type in firm A.

2. Construction strategy of ERP system for a small- and medium-sized firm

Research group Gartner defined ERP system as an application system that supports business functions in company for the first time[1]. In short, ERP supports all business processes within purchasing, production, sales, accounting, human resources, etc, and shares mutually all information occurred through these processes, and supports rapid decision making[4]. Methodologies to construct existing SW system can be classified into generally six steps; preliminary stage, analysis phase, building stage, implementing stage, end stage, etc[2]. Compared to the good and bad points about these existing methodologies to build systems, methodologies to build ERP system that ERP package can be customized for a small manufacturer were introduced in domestic[3][5]. A methodology includes preliminary diagnosis, analysis, deduction of many problems and any improved ideas, implementation, operation, informational level evaluation, etc and is a method that customises moderately ERP package to a small manufacturer. In this paper, we use a building methodology of ERP system for Korea's small corporations, and suggest a software building methodology that users and developers complete the system from the first stage of development to construction of a system continuously by mutual conversation. Because the informational level assessment process is a process after ERP system is built, we describe about the building strategy of ERP, but omit the informational level assessment process in this paper.

3. Construction strategy of ERP System based on a project type

3.1. Prediagnosis and Analysis phase

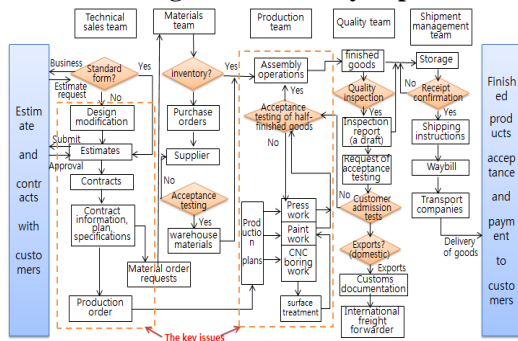


Figure 1. Current business process flowchart

[Table 1] Problems and improvements in current

Items	Problems	Improvement plans
Sales	1. Lack of information sharing about the production progress and customer response	1. Management of the whole process from order to delivery for each project due to building of information system
Manag	2. Lack of real-time progress information about business	2. A/S's rapid response and quick processing analysis by an internet-based information system
ement	3. Demand of management about A/S's business	3. Application of sales-related information about clients, items, unit prices, sales, etc by information system.
	4. A slow estimate- business and time- consuming to write estimate-business.	4. Establishment of LOT management about products, raw materials and subsidiary materials, and systematic management of A/S.
Develop	1. Plans to write BOM and to manage items information by new design.	1. Automatic generation of BOM in design drawings and construction of an information management system about items.
Manag	2. Management of added items and costs by design changes and errors.	2. Calculation management about added items and costs by design changes and errors
ement	3. Management of history matters about items and BOM by design changes.	3. Construction of a history management system about items and BOM by design changes.
Purchasing	1. Accurate materials list and improvement of purchase plans according to products.	1. Making plans of the necessary materials for corresponding system by writing and modifying BOM according to products.
Manag	2. Improvement plans to manage the common materials for every project.	2. Construction of order management and warehouse management system for every project.
ement	3. Improvement plans of LOT management about raw materials and subsidiary materials.	3. Management for every project in case of inventory and production about common materials.
Production	1. Difficulties managing delivery time about outsourcing process products.	1. Construction of the outsourcing management system and materials management system
Manag	2. Difficulties estimating materials needed to produce and of inventory control.	2. Maintenance of items information and creation of accurate BOM
ement	3. Difficulties processing the rapid production business about the changed production design.	3. Delivery of materials and accurate production through the work instructions
	4. Difficulties measuring progress, understanding processes, and responding quickly in delivery delays.	4. Calculation of materials requirements through a management program
	5. Difficulties managing accurate production schedule and the actual report by processes.	5. Construction of the fast response system in the progress and changes for every project

Firm A specializes in manufacturing platen heat exchangers. Firm A was trained to do in-company informational education and set up an infra environment (a file server, small ERP, in-house network, etc in recently). The utilization level of SW in this firm is low because workers are currently using excel, office package, small ERP, etc. Figure 1 displays a flowchart of current business process. The sales department writes cost estimates and contracts, and sends job orders to the production team. After the production team assembles materials that received from the purchasing department and completes products through press work, paint work, CNC work, etc. After a quality team checks products and supplies to customers the final products. Table 1 represents several problems and improvements from the course of all business processes. According to these improvements, this firm will definitely try to improve all business processes and to raise its productivity through the construction of ERP system and an informational business.

3.2. New business flow(To-Be)

Figure 2 displays a new business flowchart from improvement plans of table 1. The sales department registers an estimate management, an estimate control, orders management, delivery management, contracts and earned value, etc about a project. The purchase material department manages order,

inventory, a purchase request form, materials, export, purchase analysis, etc for each project. The production department manages design/production plans, calculation of lack materials, production request forms, work orders, work diaries, re-inspection, investment status management for design preparation, progress notes, cost management, etc.

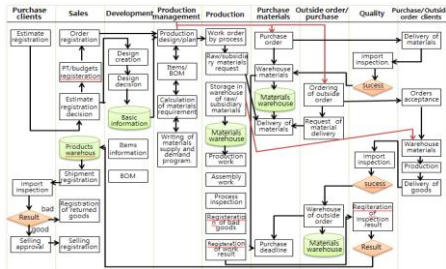


Figure 2. A new businesses flowchart



Figure 3. Configuration of a new ERP system

3.3. Construction strategy of the proposal system

Network configuration are composed of server, client and network, etc. Server environments are composed of main processor(intel xeon 2GHz), main memory(4GB), disk drives(150GB, SATA, SCSI, SAS), network (10/100/1000 Base T), O/S(MS windows server) and MS SQL server, client environment consists of O/S(microsoft windows), main processor(pentium-4 4.0GHz) and main memory(1 GB), etc and network environment consists of internet:ADSL, cable, modem, 10/100Mbps, etc.

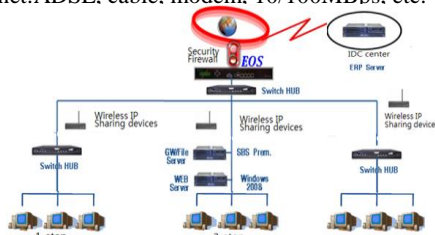


Figure 4. Network configuration

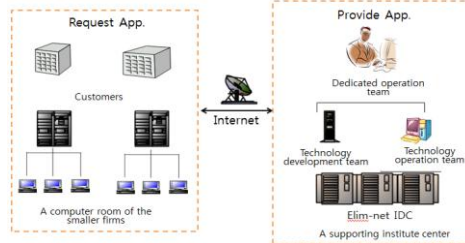


Figure 5. Co-Location method

3.4. Operation strategy of system

Because firm A has some difficult economic conditions, it's good to receive government funding for informational projects of the small and medium business administration. After building an informational system, it's good to receive a lot of help from information technology professionals and to adopt on-site method that the customer's requirements are processed quickly until the system is stabilized. If an informational system gets into the stabilizing phase, because of the possibilities of smooth communication with customers and service engineers, it's good to use remote approach that this system can be operated by a remote control function. In the high stabilizing phase, this company moves the informational system that is built on customer site to IDC center and chooses a co-location method that can support more efficient management and operation.

4. Expected effects and conclusion

In case of construction of ERP system, the expected effects are divided into two categories; qualitative effects and quantitative effects.

1) Qualitative effects : It is possible to search real time information related to business, estimate, order, purchase, production instruction, etc. Each department can figure out materials, inventory status for every project, can delete duplicate tasks, can save waiting time, and can share useful information with staff members easily and quickly.

2) Quantitative effects: Table 2 displays the quantitative effects before and after the construction of ERP system. So, if this system is introduced in firm A, this company can expect to raise productivity through standardization, integration, collaboration, real-time processing of tasks, etc. Because all departments can share more accurately information and can process quickly business, the competitiveness of this firm will really be enhanced. Therefore, in order to survive domestically and internationally in the competitive market, construction of ERP system based on a project type is required.

5. References

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[Table 2] Quantitative effects

Items	Before	After	Expected value(%)
Processing time of estimation and design for each project	2/1	1.5/1	25% increase
Confirmation time of operating procedures for each project	0.5/1	0.2/1	60% decrease
Measuring time of inventory about consuming materials	8/1	2/1	75% decrease
Waiting time of preparation and assembly of materials	12/1	6/1	50% increase
Writing time of the analysis data for sale / production stock	11/1	4/1	75% increase
Reduction time of manual work and duplicate business	8/1	2/1	75% increase
Movement time of materials, semimanufactured goods and finished goods	8/1	4/1	50% decrease
Reduction of simple repetitive tasks	8/1	4/1	50% decrease