Study on Business Process Navigation System "A-BPNS"

Ryosuke Mihara, Aoyama Gakuin University, Japan
Mari Nakamura, Aoyama Gakuin University, Japan
Manabu Yamaji, Aoyama Gakuin University, Japan
Kakuro Amasaka, Aoyama Gakuin University, Japan

ABSTRACT

In this paper, the author proposes a systematic approach to visualizing the progress of business processes (changes in people, goods, information, and costs) and seeks to build A-BPNS (Ama-lab's Business Process Navigation System), a diagnostic system that enables the timely implementation of the necessary measures. Case studies are presented covering general business in research and manufacturing development and design, where the system has been applied with significant results.

Keywords: navigation system, networking system, business flow, diagnostic system, research, development design

INTRODUCTION

The actual tasks involved in business have become highly specialized. Work often relies heavily upon the intuition and expertise of several people working in numerous divisions, with few people having more than an implicit knowledge of the job. Moreover, the various divisions differ in their approach, which means that specific tasks at the project level are not properly coordinated and the methodology is largely decided by those in charge.

The visualization of business processes is essential to understanding the significance of a job and being able to successfully perform the required tasks. By being constantly aware of potential problems and closely examining processes where such problems have been visualized, it is possible for companies to continuously improve their processes, thereby creating new values.

Furthermore, the visualization of business processes is essential in speeding up the problem-solving process. By making it possible for anyone to quickly and easily find out how a job is progressing, potential problems can be uncovered at an early stage so that effective measures can be devised and implemented without delay.

Thus, the author set about conceptualizing a diagnostic system that enables processes to be visualized while the work is actually in progress, making it possible for changes in the job's status and relevant costs to be seen at a glance and the necessary measures to be promptly put in place.

PROPOSED BUSINESS PROCESS NAVIGATION SYSTEM

Categorization of Business Processes

Conventional business processes can be categorized according to the following three ranks.

Rank 1: Simple work with no fluctuations in costs and delivery periods.
Rank 2: General work with significant fluctuations in costs and delivery periods.
Rank 3: Value-creating work with even greater fluctuations in costs and delivery periods.

In terms of the volume of work involved, rank 1 (simple work) and rank 3 (value-creating work) make up a relatively small proportion of a company's business. Rank 2 (general work), on the other hand, constitutes the vast majority of the work. Implementing daily improvements to the processes involved in general work and working efficiently in this area is therefore essential to the successful running of a company.

Recently, in particular, demand for value-creating work (rank 3) is increasing for both manufacturing and non-manufacturing businesses. In order to stimulate this kind of work, it is important to understand the business significance of general work and create new values by working efficiently and effectively in this area.

Thus, this paper deals with general work (rank 2). The author has aimed to create a business process navigation system primarily for the research industry, which is fundamental to the business world, and is currently developing this system across the development and design aspects of manufacturing.

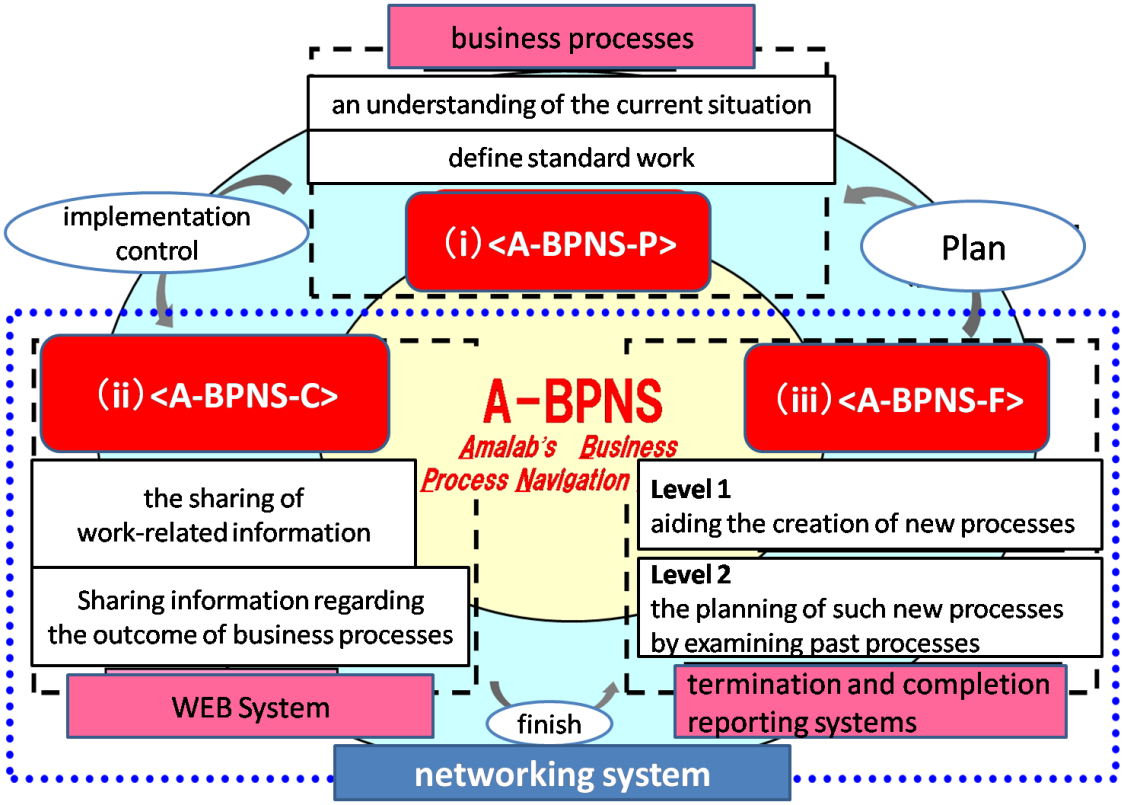

Figure 1: Conceptual Model for A-BPNS

Conceptual model for A-BPNS

Figure 1 shows a conceptual model for A-BPNS.

- Creating business processes at the planning stage makes it possible to gain an understanding of the current situation, define standard work, and carefully examine the business processes involved.
- In terms of implementation control, the sharing of work-related information further enables the sharing of product information such as the characteristics of products (results of the work) and the groups responsible for them throughout the company.

- Sharing information regarding the outcome of business processes enables evaluation at the process level, rather than based solely on the overall success or failure and final results of a project. Budgets can be managed in real time, correlating estimates with actual usage.
- Two levels of reports are produced with termination and completion reporting systems. Level 1 reports provide an overall summary of the work on A4 paper. Level 2 reports cover the observation of changes in people, goods, information, and costs from start to completion of the project.
- The abstracted process overviews provided by level 1 reports ensure that conceptualization is not restricted when planning subsequent projects, thereby aiding the creation of new processes. When this is not possible using level 1 reports, level 2 reports aid the planning of such new processes by examining past processes.

Creation of a Networking System for A-BPNS

Figure 2 shows the A-BPNS networking system. When a project starts, the specification requirements for the project are recorded in a database. For order taking, this information may come from divisions involved in customer negotiations, while for development of brand products it may come from those involved in product planning. The information can then be used by the relevant divisions for business flow creation, job categorization, and setting of standard times for each job based on actual measurements and feedback.

It is important, here, to ensure that agreement is obtained from those actually doing the work when setting standard times. Coercive attempts by management to set unreasonable standard times can actually obstruct the work, defeating the object of setting the times in the first place.

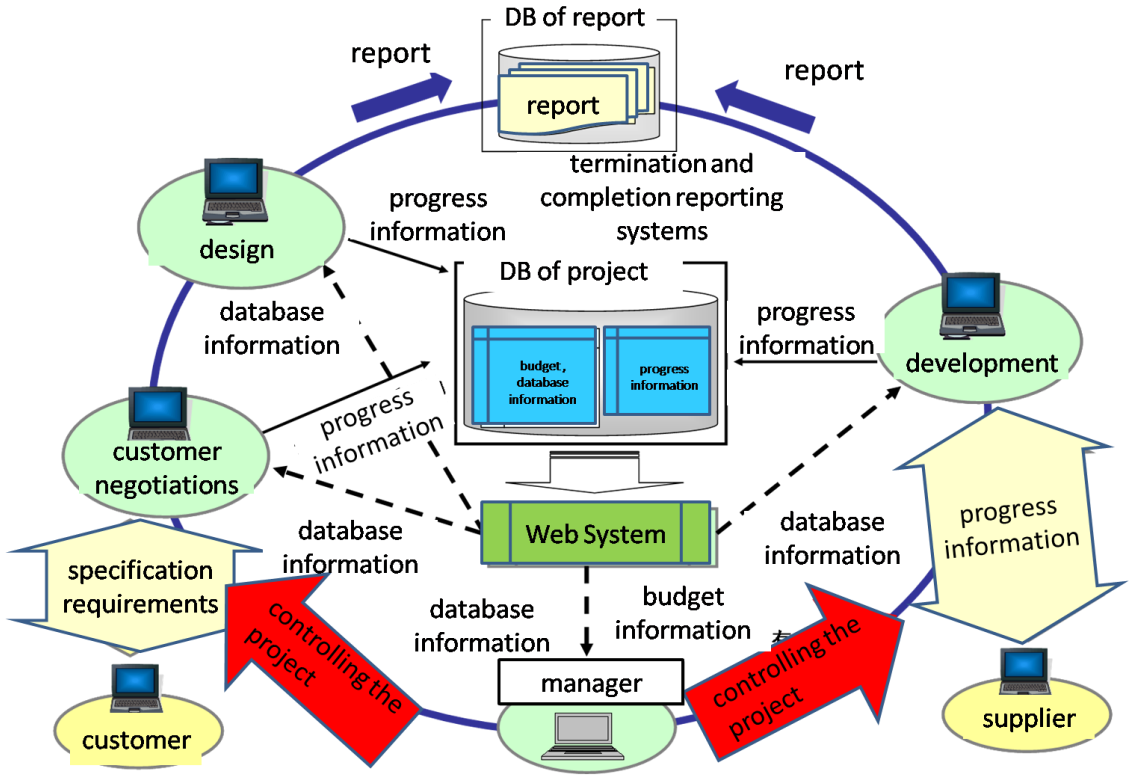

Figure 2: A-BPNS networking system

Subsequently, the actual times taken are recorded as the project progresses. The standard times and actual times can then be displayed together for comparison, enabling the data to be used to determine and manage the progress of the project. Where progress would conventionally be managed using methods unique to those in charge, this system enables progress information to be visualized and made readily available to the relevant managers and executives. This also greatly simplifies the writing of weekly reports.

By controlling the movement of people (availability of human resources) in each division via a database, it is possible to properly coordinate with other divisions. Efficient schedule management for upper level managers, in particular, is vital while a project is in progress as it can help to minimize downtime while waiting for pending authorization.

In terms of budget management, the total actual costs can be calculated by multiplying the hourly cost by the number of hours taken. This is represented on a graph together with the total budget (the hourly cost multiplied by the standard times).

After the project is finished, the whole set of tasks is considered complete when completion reports corresponding to levels 1 and 2 have been created and recorded in a database. The database information recorded while the project was in progress is made available on a special intranet website. Building such a network stimulates internal communication and aids managers and executives in controlling the project through management of the business processes involved.

Creation of Business Process Flows

The creation of business process flows is important in visualizing business processes. Information that was conventionally only implicit, such as the flow of people, goods, information, costs, and processes can be made explicit. This enables job categorization and aids the creation of a database for managing information on standard work definitions and progress status. Figure 3 shows an actual example of business flow creation.

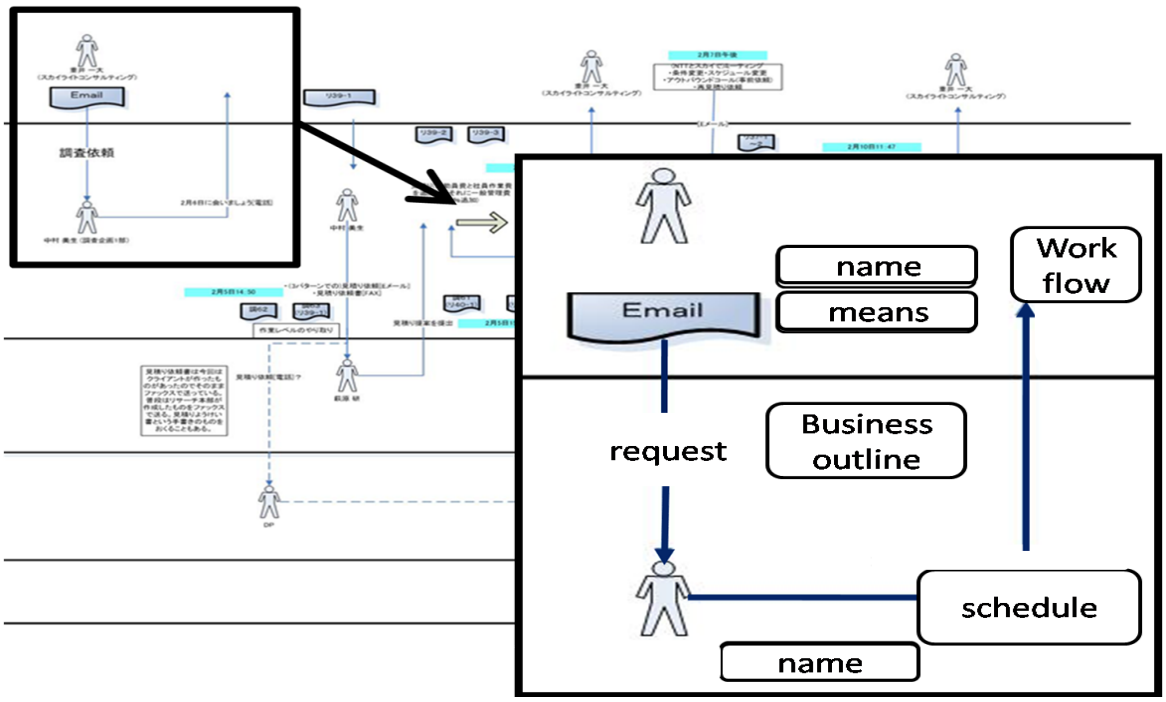

Figure 3: an actual example of business flow creation

Creation of A Diagnostic System

A budget management database enables real-time budget usage to be tracked against the original budget estimate so that it can be determined accordingly whether the actual cost of the project is likely to exceed the budget. Furthermore, if the details of both estimated and actual costs are recorded, it is possible to implement measures to absorb additional costs that arise. If the cost of the project is determined likely to exceed the budget, improvement measures such as streamlining of subsequent tasks can be implemented to control the overall cost.

CASE STUDIES

Visualization of Business in Research

This case study demonstrates how business processes involved in research were managed by visualizing the flow of people, goods, information, costs, and processes, including the flow of information through email and telephone communication unique to the field of research.

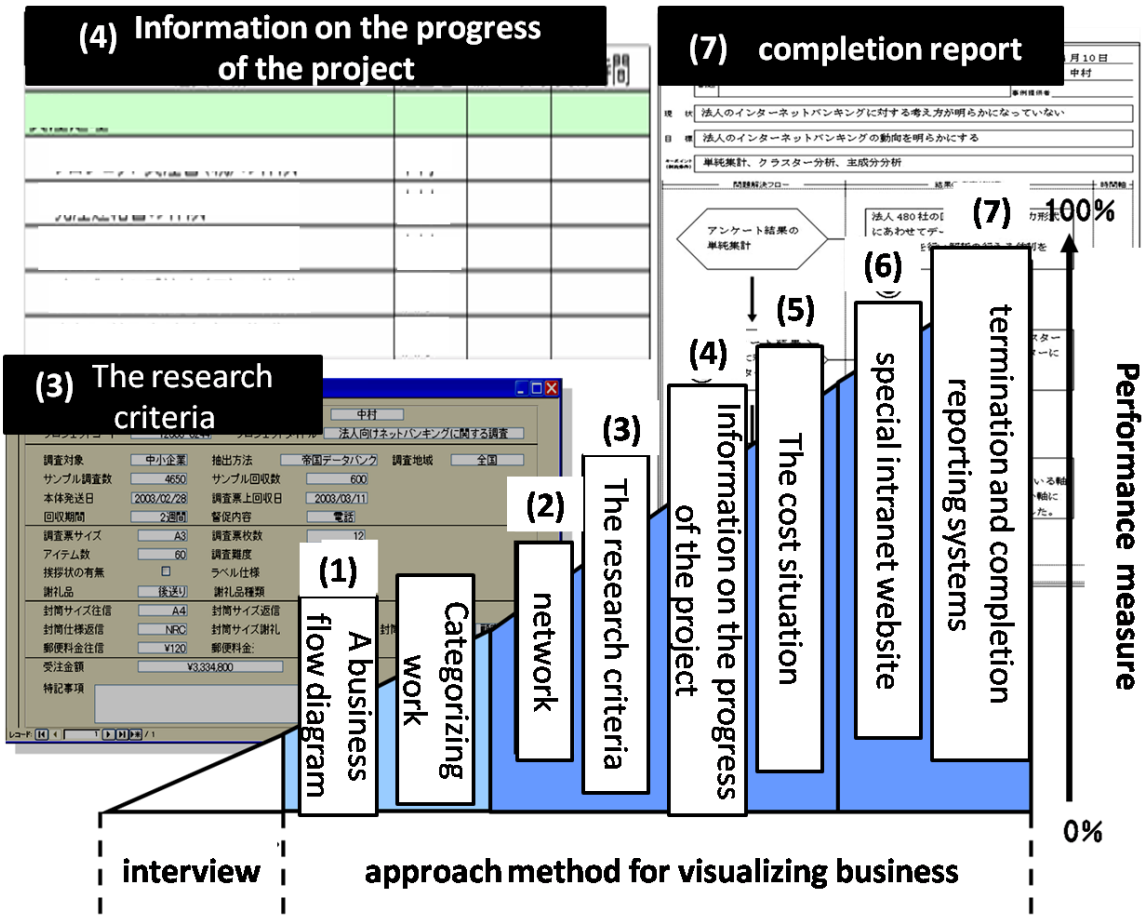

Figure 4: approach method for visualizing business in the field of research

Figure 4 illustrates the approach method for visualizing business in the field of research. The steps taken are as follows.

- A business flow diagram (figure 3) was created to explicitly clarify and redefine the business processes involved. Then, the work was categorized according to 12 job types unique to the research industry, including order processing (determining research requirements and budget), research preparation, and dealing with clients.
- A network was built in order to facilitate project management. This network included research planning division, statistics division, managers and executives, clients, and contractors.
- The research criteria were recorded in the database as soon as the project started.
- Information on the progress of the project was continually recorded.
- The cost situation was shown in real time (figure 5), giving standard times for each of the 12 job categories and total actual costs in order to visualize the predicted total costs and the total budget. The cost awareness of employees was improved by incorporating cost reductions achieved into incentive plans.
- The data from steps (3) through (5) was made available on a special intranet website and instructions were given for improvements as necessary.
- Lastly, a completion report was recorded in a database. Three report levels were devised for the completion report utilization system. Level 1 shows the balance of income and expenditure, level 2 shows progress status and summarizes relevant problems, and level 3 shows the problem-solving process (analysis methods and work flow) and summarizes countermeasures and new findings. These brief and simple completion reports aid section chiefs and executives in quickly gaining an overview of projects.

This system has been adopted for research projects and is still being used, having received a very positive evaluation.

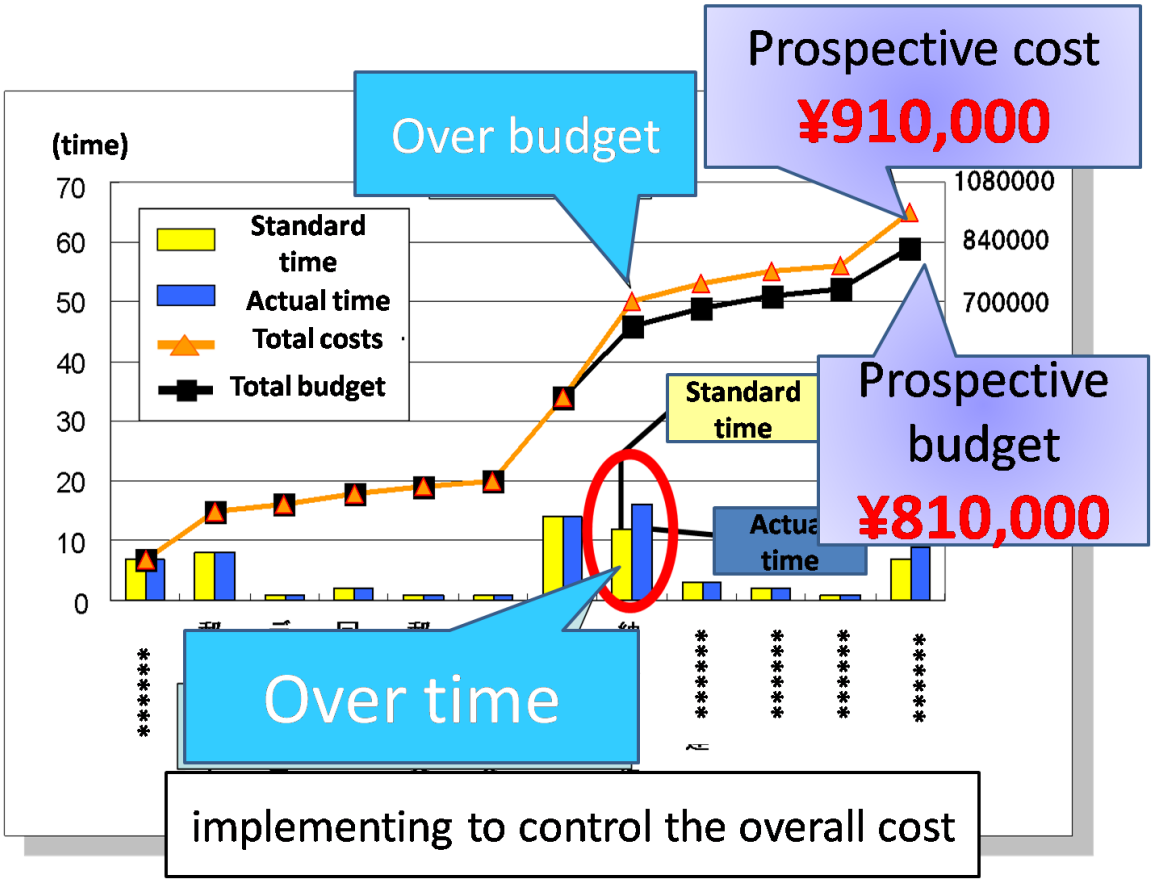

Figure 5: The example of cost situation

Development and Design of A Business Navigation System

The same steps were followed as for the previous case study. In step ①, a business flow diagram appropriate to development and design work in the manufacturing industry was created and the jobs involved were categorized. The work of each division involved in the whole product development process was redefined and the business flow was visualized in terms of people, goods, information, and cost in order to facilitate judgments that previously relied upon experience.

The design review process, which is widely used in the manufacturing industry during development and design, was utilized in the categorization of jobs. Design review is an effective management method involving confirmation at each milestone of a project where several divisions are required to work in parallel in order to complete the project. Using this process when categorizing jobs enables real-time standards to be implemented in accordance with the actual progress of each division involved.

CONCLUSION

In this paper, the author proposed a systematic approach to visualizing the progress of business processes (changes in people, goods, information, and costs) and sought to build A-BPNS (Ama-lab's Business Process Navigation System), a diagnostic system that enables the timely implementation of the necessary measures. Case studies were presented covering general business in research and manufacturing development and design, where the system had been applied with significant results.

AUTHOR INFORMATION

Ryosuke Mihara is a graduate student of the College of Science and Engineering at Aoyama Gakuin University.

Mari Nakamura received her Master of Engineering degree from the College of Science and Engineering at Aoyama Gakuin University.

Manabu Yamaji is a research associate in the College of Science and Engineering at Aoyama Gakuin University, Japan. He received his Master of Engineering degree in Graduate School of Information Systems at University of Electro-Communications in 1999. His current research and teaching interests are in the general area of production engineering. In particular, he is interested in Total Quality Management, Computer Aided Engineering.

Kakuro Amasaka is a Professor in the College of Science and Engineering at Aoyama Gakuin University, Japan. He received his Ph.D. degree in Precision Mechanical and System Engineering, Statistics and Quality Control at Hiroshima University in 1997. His current research and teaching interests are in the general area of production engineering. In particular, he is interested in New JIT. He is a member of POMS and EurOMA.

REFERENCES

1. K. Amasaka, (2005), Constructing a Customer Science Application System "CS-CIANS"- Development of a Global Strategic Vehicle "Lexus" Utilizing New JIT –, *WSEAS Transactions on Business and Economics*, 2(3), 135-142.
2. K. Amasaka, (2003), Development of "Science TQM", A New Principle of Quality Management, *International Journal of Production Research*, 42 (17), 3691-3706.
3. Atsushi Kubota, Kouji Okada, Kouji Sekiguchi, Fumito Imanoya, (2005), A Case of Business Process Innovation for Product Development in Semiconductor and Integrated Circuit Business, *Journal of the Society of Project Management*, 7(3), 38-43.
4. Paul D. Larson, Stephen G. Kerr, (2007), Integration of Process Management Tools to Support TQM Implementation: ISO9000 and Activity-based Costing, *Total Quality Management*, 18(1-2), 201-207
5. Richard Yu-Yuan Hung, Tsungting Chung, Bella Ya-Hui Lien, (2007), Organizational Process Alignment and Dynamic Capabilities in High-Tech Industry, *Total Quality Management*, 18(9), 1023-1034

6. David James Bryde, (2003), Modeling project management performance, *International Journal of Quality & Reliability Management*, 20(2), 229-254.
7. Maria-Isabel Sanchez-Segura Misanche, Javier Garcia, Antonio Amescua, Fuensanta Medina-Dominguez, Arturo Mora-Soto, (2008), A Study on How Software Engineering Supports Projects Management, Innovative Techniques in Instruction Technology, *E-learning, E-assessment, and Education*, Springer, 161-165.
8. Wuliang Peng, Rui Lu, Chengen Wang, (2007), An Enterprise-Wide Project Quality Management System in Manufacturing Industry, *Research and Practical Issues of Enterprise Information Systems* Vol. 2, 1335-1346.

NOTES