



CHAPTER II

PROJECT DESCRIPTION

2.1 Rationale

Regional Medical Science Center-Chonburi (RMSc CB), a governmental agency under the Department of Medical Science (DMSc) of the Ministry of Public Health, serves as the National Control Laboratory has responsibility for chemical physical and biological determinations involving a variety of substances for quality control of healthy products which used in the country and disease diagnosis. There are 4 sections within RMSc CB: Quality and Technical Development Section, Consumer Protection laboratory Section, Public Health laboratory Section, and Administrative Subsection.

The services currently available at RMSc CB are laboratory analysis service covering 2 main areas. The first area includes the consumer protection laboratory related issues; laboratory analyses of drug quality, herbal products, cosmetics, harmful and addictive substances, foods and medical instruments; and conducting the test and safety assessment of radiation generating equipment. The second area is the related public health laboratory includes pathological and toxicological laboratory investigations. The purposes are to prevent and control diseases or health threatening issues. The implementation of analysis has been performed according to the international laboratory quality system, ISO/IEC 17025 (The International Organization

for Standardization/ The International Electro technical Commission 17025: 1999) in order to ensure that the quality of analytical results conforms to the international standard. The ISO/IEC 17025 standards are the criteria set for both testing and calibration laboratories, which will certify that any laboratories, which have met these criteria, have been operated with a quality assurance system. (Jongdee Wongpinairat, 2000)

In 2001, RMSc CB applied for the ISO/IEC 17025 accreditation. The nonconformance to the quality assurance system was found in the area of inventory management particularly in inventory control. The inventory scientific equipment control involve keeping detailed record on each piece of equipment, including such information were serial numbers, date the equipment was purchased, price, location, agency etc. The control and maintenance of scientific equipment supplies according to the quality assurance system had not been in place. The actual coding numbers labeled on scientific equipment were still the old numbers that were not matched with the number in the record of durable articles developed in 2001. Some equipment had not even been labeled with any numbers at all (Table 2.1). This was not compliant to the quality assurance inventory control according to SENAC system (Scientific Equipment Name and Coding number system). The SENAC system is the program for registration the inventory scientific equipment.

Table 2.1: Number and percentage of equipment coding errors

Type of equipments	Number	Incorrect coding		No labeled	
		numbers			
		No.	%	No.	%
Scientific equipment	240	58	24.2	64	26.7
Computer durable articles	53	10	18.9	43	81.1

Source: Monitoring and Inspection Report, RMSc-CB Scientific Equipment Inspection Committee, 2001

As the result, efforts were made to develop and improve the inventory management in order to achieve its efficiency and streamlining. The activity of inventory management system consisted of 5 steps: Need requirement, Purchasing system, Employment, Control system, and Distribution (Suna Siltertprasit , Siriporn Panpeng). Furthermore, it was also aimed to prevent the management from becoming the constraints for other related operations of the center. A working team was established to address these problems, comprising the Director of the RMSc CB, Head of Supply and Inventory Management Unit, Financial Officer, Quality Assurance Officer, computer officer and the researcher of this project. The working team conducted a study in effort to find solutions using SWOT analysis. The primary cause of problems was found to be the high number of purchasing per year (Table 2.2).

Table 2.2: Statistics of Supply and Equipment Purchase of RMsC CB in 2001

Type of equipment	Frequency of Purchases	Averaged frequency of Purchases Per Day	No. of Items
Scientific durable articles	8	0.02	8
Scientific supplies	120	0.38	390
Office supplies	514	1.41	1,132
Total	642	1.75	1,530

Source: RMsC CB Annual Report, 2001

Basing on the 642 times of purchases per year (averaged 1.75 times/day), requests for quotations were to be made 128 times per year in the process of purchasing scientific durable articles and supplies. This was averaged as 0.7 times/day. Therefore, contacts to suppliers were to be made once every other day. A period of at least 2 days was required for each purchase for the preparation of document, making contact with suppliers requesting quotations, and seeking approval for the purchase (each purchase required quotations from at least 2 suppliers). For office supplies in particular, the inventory officer was required to procure them for every unit. As shown in Table 2.2, the frequency of office supply purchase was as high as 514 times/year. The time required for going out of the office to do purchasing was averaged 1.4 times/day, each of which required at least 2 hours for traveling back and forth. As number of purchases became higher, the number of related actions to be undertaken in the process was higher accordingly. For examples, higher number of reports to be prepared and forwarded to related offices such as Policy and Plan Division of Department of Medical Sciences in Bangkok, Chonburi Provincial Office, etc.

The high number of purchases created various impacts. It delayed other activities of RMSc CB operations. Inventory Staff had to spend most of working time for the procurement of supplies. This time constraint had affected the inventory control. Scientific equipment had not been controlled by SENAC system of the quality assurance system. This problem presented during 1999-2001 but no actions were done. According to the RMSc CB's Vision in 2005, laboratory analysis should apply for ISO/IEC 17025 accreditation, Non-conformances have been found every time of the inspection for ISO/IEC 17025 accreditation of RMSc CB. More importantly, it had caused problems. Therefore, these problems had to be addressed as an urgent basis. This was based on the concept of work model according to "Open System Theory" of Robbins and Coulter, 1999, So that the working team was established to address the problems. They conducted a study in effort to find solution using SWOT analysis and solving problem.

Concepts and Approaches towards Problem Solving

As the inventory procurement portion of the supply and inventory management system had not been carried out in a systematic manner, and in order to solve all problems resulted from this situation, a plan was developed specifically for the inventory procurement. This was based on the concept of applying work model according to "Open System Theory" of Robbins and Coulter, 1999 to solve the problems of the organization. In this theory, inputs such as policies, personnel and technologies will be taken into the management process. Activities to be undertaken by personnel, the management of the system developed, and technologies will be incorporated as parts of the working process. Training sessions will be conducted for

personnel and a working guide will be developed as a manual for personnel to follow, which will increase their working skills and enhance their capabilities. The final outputs of this process, coupled with outside factors, will be the changes in activities of personnel and the servicing activities. Furthermore, budget planning can be carried out more systematically. The outputs in the final stage of this system will help evaluate the process and provide feedback for further improvement of the inputs. Areas for improvement of such inputs may include the ones resulted from changes of outside factors e.g. changes in policies, regulations and procedures, all of which can impacts on the management system (Siriwan Serirat et. al., 1997), as shown in Figure2.1.

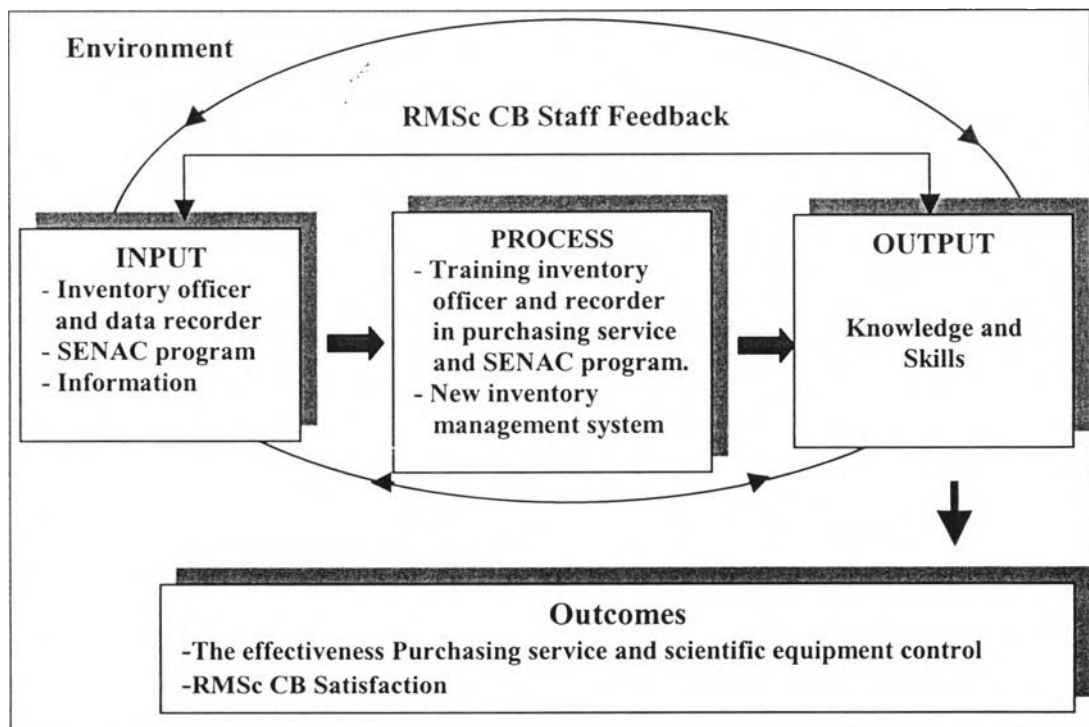


Figure 2.1: The organization as an open system (Robbins & Coulter, 1999)

2.2 Goal and Objectives

The goal of the project is to enhance the effectiveness of inventory management system of RMSc CB through the development of inventory procurement; inventory control; and improvement of related staff performance in order to achieve the following objectives.

1. To increase inventory staff knowledge and skills in inventory management.
2. To reduce the office supply purchases frequency by 50 percent by 2003.
3. To reduce the number of scientific equipment coding errors by 10 percent by 2003.
4. To increase the level of RMSc CB staff's satisfaction with inventory management system.

2.3 Methodology

2.3.1 Participants

- 2.3.1.1 Two Inventory staffs comprised of inventory officer and assistant
- 2.3.1.2 Director of RMSc CB – oversaw the performance, and provided advice to, the Working Group for the Development of RMSc CB.
- 2.3.1.3 Working Teams for the Development of RMSc CB – comprised of 5 members including the Head of Inventory Management Unit, Financial Officer, Computer Officer, Quality Assurance

Officer and the researcher. The functions of these members were divided their task.

2.3.1.4 Twenty-one persons–RMSc CB staff who work related to inventory management unit.

2.3.2 Implementation Methods

Implementation methods were divided into 3 phases: preparation, implementation and evaluation.

Phase 1: Preparation

This preparation phase was to study problems and identify approaches for the improvement of inventory management in aspects of the procurement of goods and services and the record control of scientific durable articles. There were 4 steps in this phase.

1. Reviewing Existent Working System: In this step, the working team (Head of Inventory Management Unit, Financial Officer and Quality Assurance Officer) reviewed the inventory management system and all documents related to the inventory procurement and inventory control. They also reviewed relevant regulations issued by the Office of the Prime Minister and Quality Assurance Management Manual that were applicable for the improvement of inventory management system.

2. **Planning and Goal setting:** The Director of RMsC CB, the working team and the inventory staff hold meetings together to set goals and make plans base on the results of the reviews mentioned in the first step. The meeting was also aimed to define training needs for staffs.

The data obtained through the review and the statistics on procurement of goods and services of RMsC CB in 2001 were compiled and submitted to director of RMsC CB to plan for finding ways of improvement. The plan was then developed to incorporate with training for inventory officer and the assistant. In the plan for improvement also included the development of standard manual for procurement of goods and services and the users' manual SENAC program to record the scientific equipment coding numbers. The aim was to reduce the office supply purchases frequency by 50 percent and the number of equipment coding errors by 10 percent by 2003

3. Designing and Developing Supply and Inventory Management

System: To facilitate the process of developing a new system, operational process and procedures were defined, documented and updated, especially the ones that played significant roles in operational control over inventory management system. The Head of Inventory Management Unit revised existent documents or designed new documents basing on the comments obtained from the review group.

The operational controlling factor for overall activities that significantly affected the organizational performance was the requirements set in the ISO/IEC 17025. To ensure that these requirements would be met, operating methods and procedures had to be written down for all activities. This would provide consistency regardless of staff changes, and would have clear ideas about job responsibilities that they would be accountable for inventory management system.

Work Manuals: This would be used as the guide for undertaking all tasks in the inventory procurement and inventory control. The Head of Inventory Management Unit was responsible to develop these work manuals to create clarity in each step of supply procurement and inventory control in accordance with the Quality Manual (QM).

The key manuals/handbooks of Inventory Management Unit included the ones as below:

- 1. Manual for Procurement of Goods and Services:** This would provide all personnel in Inventory Management Unit and the head of each section with the details of all procedures in various methods of procurements. It also included right steps to be taken, supplied with official blank forms, according to the Regulations on Inventory Management system issued by the Office of the Prime Minister (Pirat Sangtin, 1992), and revised versions thereafter. This way, all related personnel would have a written document to refer to and take into practice towards the same directions. The flow chart displaying all necessary steps of the procurement of goods and services was developed and displayed for all staff to follow.

2. Handbook of assigning and control of scientific equipment coding

number: This would provide information on categorization of equipment clearly with their current code numbers, locations, and statuses to all work units for the purpose of maintaining the conditions of the equipment and preventing their relocations. The inventory management personnel could use this as the data for entering the coding number for scientific equipment using SENAC Program under the supervision of the Head of Inventory Management Unit.

3. Users' Manual for SENAC Program:

This was the software program used for recording the code number of scientific equipment. The manual provided all details ranging from getting the access to the program, entering all data and how to exit from the program. Relevant flow chart was developed as reference in each work unit. Computer Officer was responsible for training staff how to use the program and the Head of Inventory Management Unit oversaw all these activities.

During the implementation of the procurement project procurement procedure was added two steps: 1) Stock checking and using computer for entering and storing the data about the stock of supplies to make it more convenient for determining the quantity of supplies to be purchased. 2) Making a purchase plan every 3 months distribute supplies by types and categories, and by work units requesting for the purchase, to determine the details of purchase plan and set a specific time for each purchase.

Phase 2: Implementation Phase

Implementation period ranged for 6 months.

1. **Training** inventory officer and the assistant were trained how to use SENAC Program to assign the code for scientific equipment. This was conducted on a basis of on-the-job training (Schermerhorn, 1996) together with used SENAC program manual for one day (2 hrs) /week consecutively for one month by computer officer. It was aimed that they could acquire skills of using computer following the users' manual for SENAC Program provided.

The following are the summary of training:

First week focused on introducing inventory staffs to the basic computer and SENAC program manual. The inventory staffs were introduced to Windows, Microsoft office, and were then introduced to SENAC program manual.

Second week and third week, the trainer gave an introductory presentation on using SENAC program to record, add, edit, delete and print out data. The staffs were asked to do data processing to ensure they understood the processed involved.

Fourth Week, the inventory staff were testes their knowledge regarding the SENAC program.

2. **Test new system.** The revised system was implemented on a trial basis for a period of 2 months. An announcement was made about the adoption of newly developed manual for the procurement of goods and services, stock checking and

inventory control, which would be implemented by inventory staffs. All work units were notified about the new process and were requested to follow new procedures step by step. The inventory control through the assignment of coding numbers to scientific equipment was carried out according to the newly developed manual. Work performances of inventory officer and the assistant were monitored to ensure that they were carried out following the newly developed manual as well.

Phase 3: Monitoring and Evaluation

1. Monitoring

1.1 Monitoring inventory control system

The assignment of coding number for scientific equipment was monitored to ensure that it was carried out as planned and within a given timeframe. For any emerged delays or in cases that the registrations of equipment in accordance with the plan were not feasible, problems and obstacles were recorded for further finding of solutions or revision of the plan. Head of Inventory Management Unit and the Quality Assurance officer monitored the registration entry of scientific equipment using SENAC program by inventory officer and the assistant on a weekly basis. This was conducted by testing performance skills using the skill test throughout the period of 4 weeks of the one-month training. After the training completion, an observatory monitoring was conducted one more time in order to verify the results of the training. The content of the training was reviewed with inventory staff and their performances were checked once a month to ensure that they had confidence in performing their jobs.

1.2 Monitoring Inventory Procurement Procedure

This monitoring was aimed to ensure that the procurements were carried out in accordance with the procedures agreed by all sections. For any mistakes made in the procurements or any procurement that were not carried out in line with the defined procedures, the Inventory Officer had to report them to the Head of the Unit. This was an effort to collect all procurement data of 2002 to compare with the ones of 2001.

1.3 Recording Implementation Outcomes

The Head of Inventory management Unit recorded the implementation outcomes in all aspects of the procurement of goods and services in order to learn about the progress of the implementation gain the big picture and find solutions for any emerged problems in a timely manner.

2. Evaluation:

Firstly, work performances in regard to the procurements of goods and services were evaluated to find out whether they were carried out in responsive to actual needs. This evaluation was carried out by asking inventory management personnel, service recipients of inventory management unit, the Head of inventory management unit, and Quality assurance officer through the procurement data obtained for the year 2002.

Secondly, the inventory control was evaluated by assessing the skills of the inventory officer and the assistant who were trained about the registration of coding number for scientific equipment using SENAC Program. The assessment was conducted to find out whether they were able to use the program and entry all data completely. They were asked to answer the questions related to the checklist of the registration procedures as a part of the assessment.

Finally, the satisfaction of RMSc CB staff whose works related to inventory management was evaluated by using questionnaire in pre-test and post-test.

2.4 Expected Outcomes

1. Work performances of RMSc CB are carried out in accordance with the quality assurance system and become creditable and reliable for other agencies.
2. The inventory management system is efficient in all aspects and it can support analysis activities of RMSc CB properly and precisely.
3. Annual budget of RMSc CB can be prepared correctly in a timely and cost-effective manner.

2.6 Project Budget

Budget Category	Phase I	Phase II	Total (Baht)
1. <u>Personnel</u>	In-kind	In-kind	In-kind
Inventory officer	contribution	contribution	contribution
Data recorder	from RMSc	from RMSc	from RMSc
Committee.	CB	CB	CB
2. <u>Equipment and materials for training</u>			
Manuals/handbooks of Supply and Inventory Management Unit		2,500	2,500
Training material	3,000		3,000
Lunch/snacks	1,500		1,500
3. <u>Administration/logistics</u>			
Transportation and communication	1,500	1,500	3,000
Project document	3,000		3,000
Other logistics	2,000	2,000	4,000
4. <u>Field expenses</u>		1,500	1,500
5. <u>Incentives</u>			
Lunch/incentive	2,000	2,500	4,500
6. <u>Monitoring and Evaluation</u>			
Pre-posttest evaluation	500		500
Monitoring		2,500	2,500
Final evaluation		1,500	1,500
7. <u>Other incidental expenses</u>	2,000	2,000	4,000
Total	15,500	16,000	31,500