

8-2. Personnel Administration

8-2-1. Basic Functions and the Data Processing Methods

8-2-1-1. General

The basic functions required for the information system concerning personnel administration are as already described in section 4-2-6. Matters to be considered for establishing this system could be summarized as follows.

- i. The data volume to be handled by this system will be quite large. Though the data volume is not so large as that of the system module for registration of enterprises, the data volume of this system module is one of the largest compared with other system modules.
- ii. The source data are mostly literal data rather than numeric data due to the nature of the information. Therefore, code conversion of the data into numeric data must be performed as much as possible for the efficient use of the computer processing equipment (especially for efficient information retrieval). This operation is partially computerized at this moment, and the code tables are already prepared.
- iii. The selection of the input items for this system of all of the personnel related information must be performed based on thorough consideration of the current and future requirements of its usage. The major reason for this is because of the large data volume of this operation and the complicated processing requirements

of the on-demand information retrieval so that it would not be easy to change the processing methods in the future.

- iv. Generally, the accumulated data volume of personnel history information is subject to variations for each staff member, which must be considered for the designing of the file.
- v. The function for on-demand information retrieval is suited for random access processing. Therefore, formation of the master file for personnel administration and design of the data structure must be considered bearing these facts in mind. Furthermore, the conditions for the information retrieval to be specified must also be considered to reflect the needs of the users in order to afford convenience for the information retrieval.
- vi. The main features would be the data items relating to personnel history records to be newly added to the input items for this system. Code design of the items should be formulated in accordance with the currently established code system. However, it must be carefully examined to see if the current code system will function effectively in regards to the new processing requirements of this system, such as information retrieval and tabulation. Examination and the necessary revisions of the code system should be performed at this time.

vii. Personnel affairs information are the basic information for an organization to make plans concerning their assigning of right persons in the right post and also as a basis for future recruiting of suitable new applicants. Therefore, accuracy of the data is required for the personnel administration system on a level meeting with standards for other operations. Therefore, a thorough consideration for the establishment of data check and data maintenance is required.

The information system for personnel administration can support the activities of the Head Office in the following manner when the system planning and the system development is performed in accordance with the considerations stated above.

- a. The current conditions of manpower capabilities of each office and operation unit can be checked on a regular basis.
- b. Checking and evaluation of the knowledges, technical know-how, and professional experience and other skills of the staff members could also be performed on a regular basis.
- c. This system can therefore support the regular activities relating to policy making for concrete planning of personnel affairs in both long and short terms such as personnel transfers, recruitment, and training.

- d. This system can support the actual daily activities relating to personnel administration, such as selecting suitable person for overseas training or for assignment to projects, by furnishing the necessary information whenever required.

As stated in the above, this system can function to support various activities of personnel planning and evaluation not only for the strategic decision making on a macro level but also the individual decision making at the micro level.

8-2-1-2. Flow of Input/Output Information

The flow of input/output information concerning the information system for personnel administration and how each operation unit plays their part in this system will be made clear. Flow of transactions and reports, and also the relation between each operation unit and the procedures, are summarized and illustrated. The detailed flow of computer processing is mentioned in the following section 8-2-1-3.

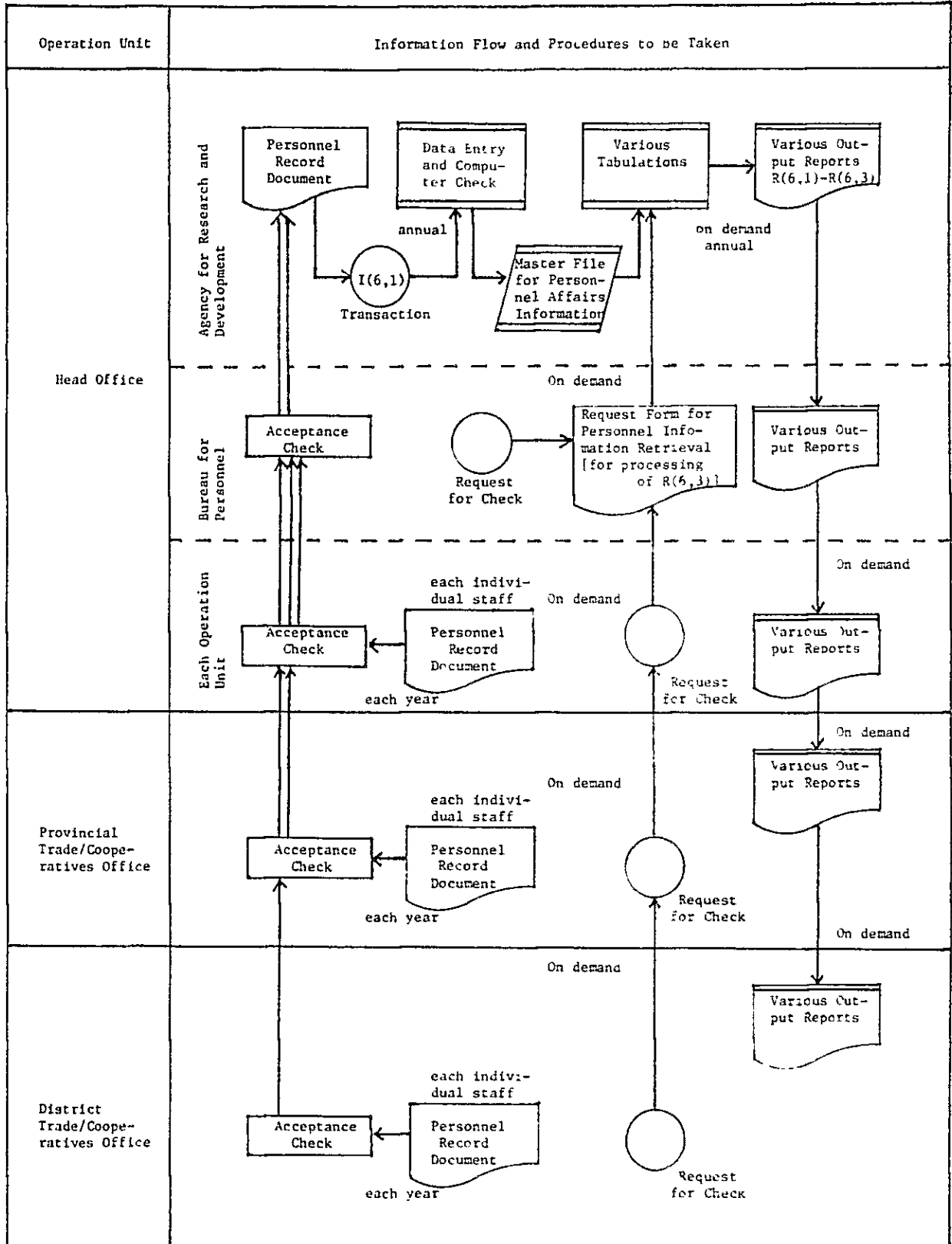
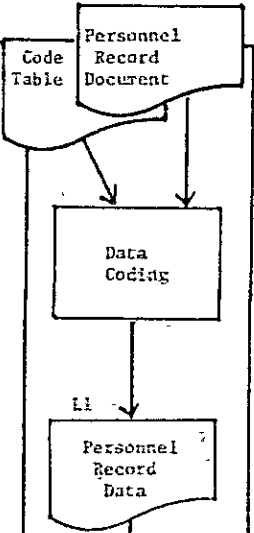
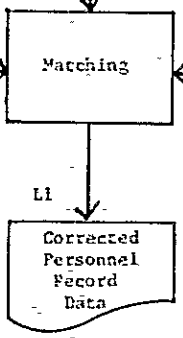


CHART: Flow of Input/Output Information

8-2-1-3. Computer Process Flow

The actual procedures required for the computer processing from the data entry to the reporting will be examined, and the detailed process flow is shown in the following charts.

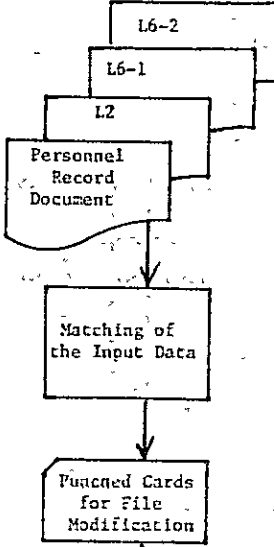
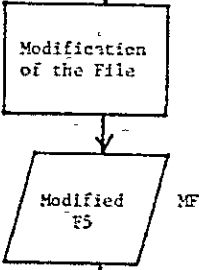
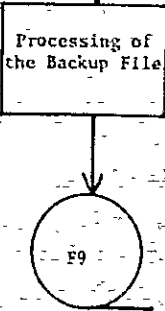
PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP1	Initial	 <pre> graph TD A[Personnel Record Document] --> B[Data Coding] C[Code Table] --> B B -- LI --> D[Personnel Record Data] </pre>	<p>The data obtained from personnel recorded documents will be posted to the coding sheet. Some of the data will require code conversion in accordance with the code table. Following is the data volume</p> <p>16,000 person x 2,000 c/ person = 32 MC</p>
MP2	Initial	 <pre> graph TD E[Personnel Record Data] --> F[Matching] F -- LI --> G[Corrected Personnel Record Data] </pre>	<p>Checking of personnel information posted to the coding sheet will be performed by collation by reading out. If any posting errors are found, it will be corrected on the coding sheet.</p>

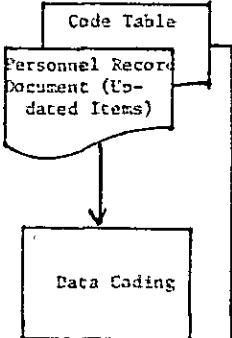
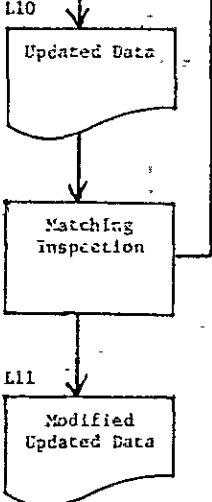
PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP3	Initial		Key operators are to perform data entry based on the corrected coding sheet by key-to-floppy disk unit. Approximately 32 floppy disks with capacity of 1 MB will be required.
CP4	Initial		To check all the data recorded to the floppy disk concerning personnel information and edit the data to form a master file to be recorded on disk packs. A list of error data will also be prepared.
CP5	Initial		To sort the data by offices, operation units, and employee number. If there are no errors in the processing of CP4, CP6, CP7, this sorted disk pack will become the master file for personnel administration. The data volume of this file is equal to MPI. Processing of MP9 will be performed next if the correct master file is completed.
CP6	Initial		To check the overlapping registered data, etc., and to output a list of error data. Also, a detail list of correct data will be processed.

PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP7	Initial	 <pre> graph TD A[Personnel Record Document] --> B[Matching of the Input Data] B --> C[Punched Cards for File Modification] </pre>	<p>Matching of all of the input data will be performed for checking. Also, checking of the error data recorded on FS will be performed. The error data items of the file will be modified.</p>
CPS	Initial	 <pre> graph TD A[Modification of the File] --> B[/Modified FS MF/] </pre>	<p>Punched cards for file modification will be arranged in the order by offices, operation units, employee numbers. FS will be modified in accordance with this information. This master file will be used as the input for the annual processing or processing of various reports at this time. This master file must be kept until the annual processing of the year after the next is performed.</p>
CP9	Initial	 <pre> graph TD A[Processing of the Backup File] --> B((P9)) </pre>	<p>Backup of the correct master file will be prepared on a magnetic tape. The physical volume of the input/output file required for this processing is performed to be prepared just in case of the troubles arising to the master file.</p>

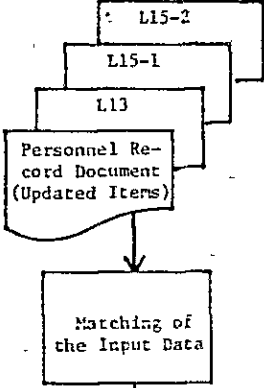
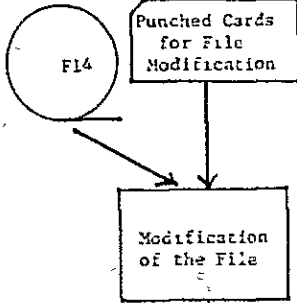
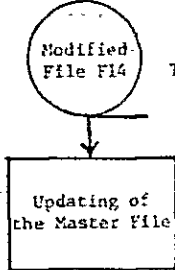
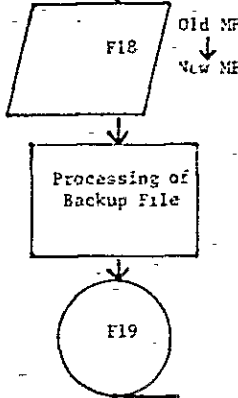
PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
NP10	Annual	 <pre> graph TD CT[Code Table] --> PRD[Personnel Record Document (Updated Items)] PRD --> DC[Data Coding] </pre>	<p>This processing is similar to the processing of NP1. Following is the data volume.</p> <p style="text-align: center;"> $16,000 \text{ person} \times 300 \text{ c/person}$ $= 4.8 \text{ MC}$ </p> <p>The data volume will be less since only the updated items of the personnel record document will be subject for data entry.</p>
NP11	Annual	 <pre> graph TD L10[L10] --> UD[Updated Data] UD --> MI[Matching Inspection] MI --> L11[L11] L11 --> MUD[Modified Updated Data] </pre>	<p>This processing is similar to the processing of NP2.</p>

PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP12	Annual	<pre> graph TD L11[/L11/] --> DE[Data Entry] DE --> F12((F12)) </pre>	<p>This processing is similar to the processing for MP3. Approximately five floppy disks will be required.</p>
CP13	Annual	<pre> graph TD DCE[Data Check and Edit] --> F13((F13)) F13 --> EDL[/Error Data List/] </pre>	<p>This processing is similar to the processing for CP4. Output on magnetic tape is considered economical.</p>
CP14	Annual	<pre> graph TD S[Sort] --> F14((F14 (TF))) </pre>	<p>This processing is similar to the processing for CP5. However, the sorting should be performed based on magnetic tapes. If there are no errors to the data processed by CP13, CP15, MP16, file F15 will be the transaction file. In this case, processing of CP13 will be performed next.</p>
CP15	Annual	<pre> graph TD DCP[Data Check and Processing of Data List] --> EDL1[/Error Data List/] EDL1 --> DLI[Detail List of Input Data] </pre>	<p>This processing is similar to processing for CP6.</p>

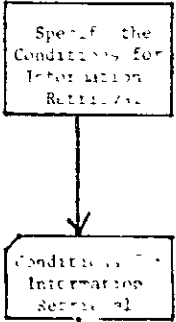
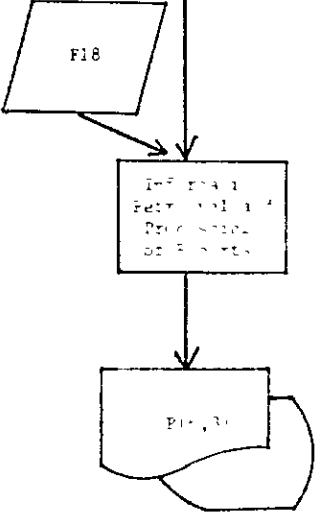
PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP16	Annual		This processing is similar to the processing for CP8.
CP17	Annual		This processing is similar to the processing for CP8. The modified file F14 will be the transaction file. This transaction file must be kept until the next annual processing is performed.
CP18	Annual		Master file will be updated by the transaction file. Only the updated information will be used for modification to be performed on the old master file.
CP19	Annual		Copy of the new master file will be recorded on magnetic tape.

PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
CP20	Annual	<pre> graph TD FIS[FIS] --> P1[Processing of the Report on the current status of the staff] P1 --> TD[/Totalized Data/] P1 --> R61[R(6,1)] TD --> R61 </pre>	<p>Reports on current status of each staff employee will be processed by the updated master file. Processing of data necessary for the preparation of the report on the current staffing status will also be performed and the results will temporarily be kept on a different disk pack.</p>
CP21	Annual	<pre> graph TD P2[Processing of the Report on the Current Staffing Status] --> R62[R(6,2)] </pre>	<p>To edit the totalized data temporarily kept on the disk pack and prepare a report on the current staffing situation.</p>

PROCESS CHART

Process Number	Processing Frequency	Process Flow	Remarks
MP21	On Demand		<p>When request for information retrieval is received from operation units, conditions for the information retrieval are determined on the basis of retrieval conditions furnished by the requesters. The program is then executed in accordance with the conditions.</p>
CPC2	On Demand		<p>The information retrieval program of F18 is executed in accordance with the conditions specified in the information retrieval program of F18. The results of the information retrieval are then stored in the staff room. The program is then executed in accordance with the conditions specified in the information retrieval program of F18. The results of the information retrieval are then stored in the staff room. The program is then executed in accordance with the conditions specified in the information retrieval program of F18. The results of the information retrieval are then stored in the staff room.</p>

8-2-2. Considerations to be Made for the System Planning

This section summarizes the points which must be considered when establishing the system for personnel administration and also problems to be solved in advance.

8-2-2-1. System Development Plan

(1) Systems Analysis

Following points must be considered for the examination of the plan when preparing analysis of the current operations and determining the data processing requirements.

- a. In order to attain a certain level of accuracy concerning the data, it would be helpful to know the accuracy of the data processing being performed at C.B.S. and also the current methods/system applied for the data check. This will give rise to suggestions for the data check system to be established at the Head Office.
- b. The items mentioned in the personnel record documents, being submitted by each staff member, which could be checked by each office or operation unit must be made explicit. And also, the status of the current data check actually being performed must be known. Data check should be delegated to each operation unit as much as possible, so far as there will be no problems.
- c. The data check to be performed at the stage of data entry should basically be conducted by collation by reading out. Code book will be used for this exercise. Therefore, the code table and code system should be designed from the

point of human engineering so that inadvertent errors can be avoided. On the other hand, this code system must be considered to meet the future requirements when the system is extended.

- d. Data check can be performed not only manually but also by automatic computer check at the operation unit utilizing the computer. Thorough consideration for the work responsibility between these two check methods will be necessary.
- e. The data items to be covered by the personnel administration system depends on the requirements by the users. Especially, if the personnel information is to be used widely by the smallest operation units of the Department, the requirements by these operation units must be studied in advance. However, since the data volume of this system will not be as large compared to that of the registration of enterprises, it will actually not be so difficult to add new items to this system in the future.
- f. There are three types of output reports required of this system completely different in their contents and utilization. The detailed items of the reports and requirements for totalization should be determined in advance by considering the purpose of the usage.
- g. The regular processing for tabulation are performed on an annual basis. Therefore, it is assumed that the requirement for on-demand information retrieval will be high. The function this system must have for the on-demand information retrieval must be determined by conducting interviews with the user.

In this case, the requirements for the detailed list concerning all of the staff employees will decrease. The relation between the two conflicting nature of the information must be considered at the same time.

- h. The function to output the results of the information retrieval on a CRT display unit will be most convenient when the information must be obtained urgently. However, this will mean that the basic information of each staff member can be disclosed at anytime. Therefore, the operational requirements must be considered together with the limitation of the utilization of the data, and some kind of a standard should be established in this sense.

(2) System Design

The following points should be considered for the planning of the work to be performed for the system design.

- a. Items to be covered in each of the three types of output reports should be determined according to the purposes of each output report when performing the design. Furthermore, the output items of the report for the on-demand information retrieval will greatly differ depending on the specified conditions of the retrieval. Therefore, the output reports must be designed to satisfy with ease the various output requirements. And also, most of the output items are obtained from the file in the form of codes, which is common in the case of all output reports. These must be converted and expressed in a form easy to be understood.
- b. It is necessary to limit the input items as much as possible

- when selecting from the personnel record documents, however, these items must not be disregarded just because the need for them is not high. This is because the information relating to personnel affairs are very important and also because the total items mentioned in the personnel record document is not too many. It must be considered from the point that once the personnel information is recorded in the file, the chances for disclosure of personnel information will increase. Determination of the input items should be emphasized on this point.
- c. Data check must be considered separately for those items to be performed at the time of data entry and at the time of processing of the file. Overall reliability of the data must be improved by examining the appropriateness of the data check to be conducted by each method.
 - d. Key-to-floppy disk unit will be suitable for the data entry. Optical character reader (OCR) can omit the procedure for data coding and enable the transaction data to be input directly to the computer. In this case, the personnel record document must be modified to enable the data entry by OCR. All of the staff will be required to fill in this new form. To successfully introduce this system, training of all of the staff for filling in the form will be necessary which will require a long preparation period.
 - e. Especially, the code system and the code book must be designed carefully for performing accurate and quick data coding.
 - f. Disk pack units are considered to be the most suitable memory media for the master file for personnel information. Magnetic tapes could also be used as the memory media for the estimated

data volume.

- g. Designing of the on-demand processing is the most difficult among all data processing concerning personnel information. Processing logic must be designed for the input of conditions and other requirements for the information retrieval and for the interpretation.

(3) Program Development

Consideration of the development plan of user programs must be based on the following points.

- a. The user programs to be developed are mainly for data check, updating of the files, data retrieval, and preparation of output reports. COBOL is relatively suitable as the programming language.
- b. The development scale of such user programs can be reduced by using basic softwares and application programs. The possibilities of using these programs must be examined for the development planning at the initial stage of development.
- c. Also, as in the case of registration of enterprises, program design, coding method, check method, and preparation of documents must be standardized when examining the development plan.

(4) File Preparation

Following points must be considered when designing the initial master file necessary for the operation of the personnel administration system.

- a. The preparation of the personnel information master file is

performed in the following manner. Data coding - matching, data entry - matching, and establishing a master file by computer. These procedures must be standardized in accordance with the results of systems analysis, system design, and program design.

- b. As already mentioned before, data check is to be performed both by manual operation and computer operation. As for the established master file, the final reliability of the data can be checked qualitatively by means of sampling check of the data recorded in the file.

8-2-2-2. System Operation Planning

(1) System Installation

A test run of the programs developed is required. This is to perform the annual processing for preparing the regular output reports (processing for CP 20 to CP 23) using the basic softwares, application programs, user programs, and the initial master file for personnel administration. The output report obtained should be examined by the actual users. Also, the retrieved information should be output on the CRT display unit to retrieve the display method. The examination should be performed together with the cooperation of the systems analyst, systems engineers, and programmers in order to find out and eliminate any difficulties in the operation.

(2) System Execution

Special attention must be paid to the confirmation of the reliability of the data and data maintenance, after the system instal-

lation is completed prior to shifting to full-scale operation.

8-2-2-3. System Maintenance Plan

(1) System Evaluation

Emphasis must be placed on the following points at this stage.

- a. Reliability of the recorded data.
- b. Maintainability of the data relating to personnel administration such as the files and output reports.
- c. Adequacy of the data entry procedure.
- d. Adequacy of the output items of the report.
- e. Adequacy of the specifications for the on-demand information retrieval.

Such evaluation of the system must be performed continuously after the system is placed into service. This means that the evaluation of the system is to be performed right after the annual processing is completed to prepare for the next annual processing, rather than to be performed at a certain time period after the processing is completed.

(2) System Improvement

If necessary, modifications will be made to the above mentioned key items for the system evaluation. This procedure must also be performed after the completion of the annual processing following the system evaluation.

8-2-3. Hardware

Following are the requirements for the hardware configuration in

accordance with the above considerations for the operation.

- a. Floppy disk reader unit is suitable as the data entry device.
- b. Minor modifications to the master file and transaction file will be made by punched cards.
- c. Master file should be established on disk packs. But the transaction file and backup file should be recorded on magnetic tapes.
- d. The intermediate file for the computer processing will utilize disk packs.
- e. Output on CRT display will be made possible for the results of on-demand information retrieval.
- f. The development of user programs will be performed not only by batch processing but also by real-time processing using TSS terminals.

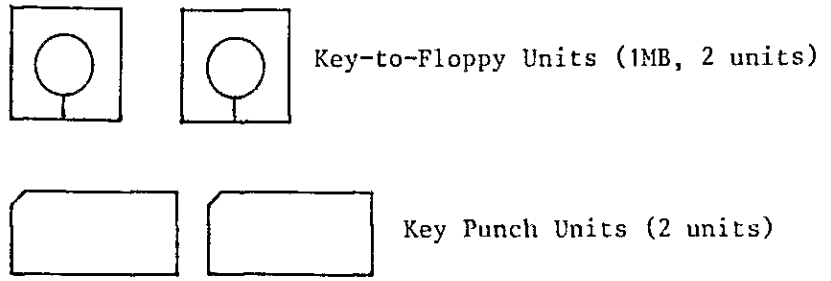
Based on the above considerations, the minimum hardware requirement for the development and operation of this system is shown in the chart below. The installation of the hardware can be referred to section 4-3.

Also, the number of key-to-floppy disk units necessary for performing the data entry will be determined as follows:

The data entry volume at the initial stage is rather large, however, the number of key-to-floppy disk units will be determined by the requirements based on annual data entry volume. It will be planned to perform the data entry processing for the data volume of 4.8 MC within three months. The total work load required for the data entry would be 4.8 man-months when the floppy operator is

capable of performing data entry of 1MC per month. In this case, two key-to-floppy disk units will be enough for two floppy operators to complete the annual data entry within three months. However, it would require 16 months to complete the initial data entry by this work force.

(Off-line Data Entry Device)



(Computer and Interface Device)

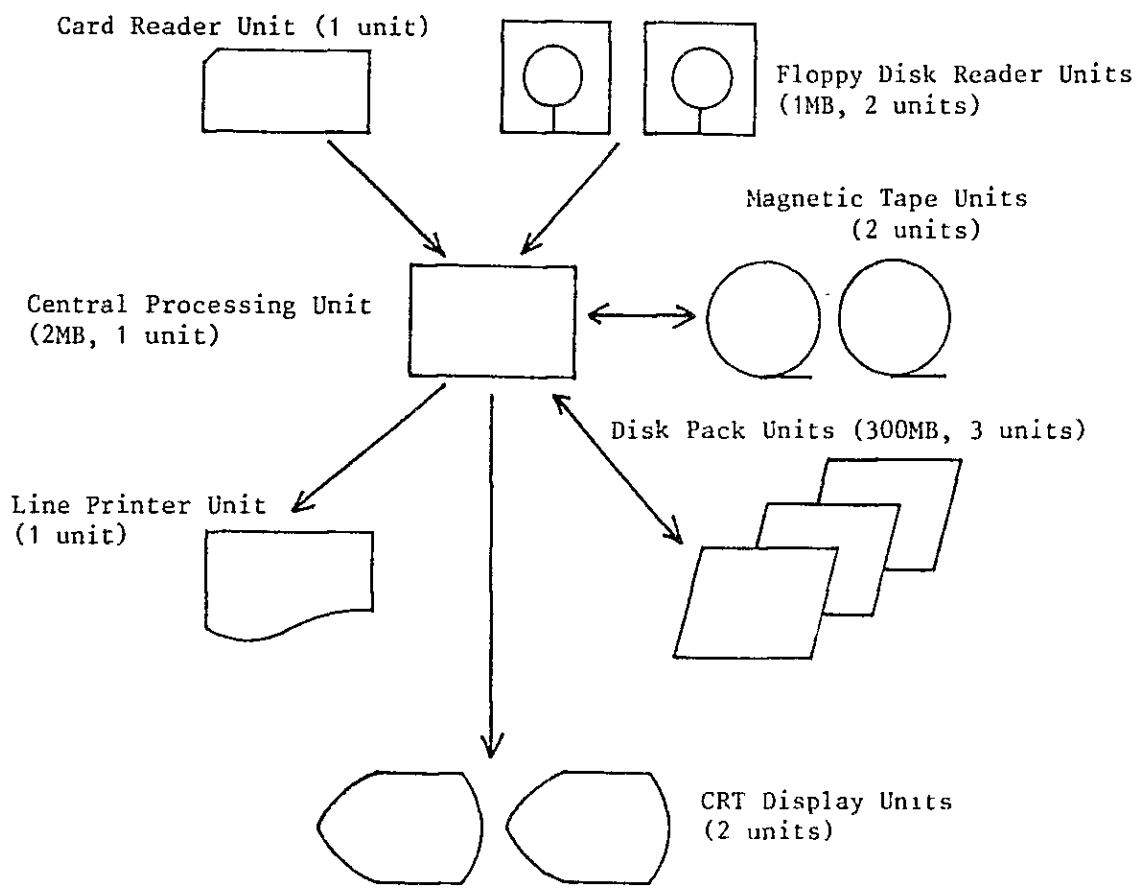


FIGURE: Minimum Configuration of Hardware

8-2-4. Software

Following softwares must be prepared for this system.

(1) Basic Software

- a. Operating System.
- b. COBOL Compiler.

(2) Application Program

- a. Linkage Editor.
- b. Editor/Screen Editor.
- c. Program Source Code Management System.
- d. Screen Image Definition Program.
- e. Software Testing/Evaluation Tool.
- f. SORT/MERGE Program.
- g. FILE UTILITY.

(3) Programming Language

The user programs should be developed using COBOL as the programming language.

(4) User Programs

User programs must be developed for those processings such as data check, preparation/updating of files, data retrieval, preparation of output reports out of all the processings described in section 8-2-1-3. Approximately, 10 programs amounting to a total of 20,000 steps is estimated as the development scale of user programs, which will be performed by use of COBOL language.

8-2-5. Staff Training Plan

Manpower requirements and training curriculums generally required for the system installation is as already mentioned in Chapter 5. The manpower requirement for the development and operation of the system must be considered in the same manner. Therefore, the characteristics of the development and operation of this system module will be focused on and described. A training plan reflecting these features will be planned at the stage of on-the-job training of the staff personnel.

(1) Systems Analyst (SA)

Systems analyst must conduct the systematization of personnel administration affairs by placing emphasis on the following points.

Close cooperation with the systems engineer is necessary for undertaking the systems analysis and making suggestions. If necessary, systems engineer may hold this job concurrently.

- a. To examine and analyze the current status of the system concerning data check methods, reliability, and the maintainability.
- b. To examine the maintainability of the data and standards for management and operation.
- c. To examine the coding system of the data.
- d. To examine the code book to be used by the key operator and standardization of data entry procedures.
- e. To establish a data check system at each office, operation unit, the Head Office, and sections in charge of computer operations.
- f. To understand how the personnel information is utilized and to determine the input and output information items.
- g. Especially, to clearly define the positioning of on-demand information retrieval.

Generally, a staff in charge of personnel administration at the Head Office should be appointed as systems analyst.

(2) Systems Engineer (SE)

After conducting the systems analysis, systems engineers must undertake system design with the cooperation of systems analysts. Also, systems engineers will be in charge of evaluation and improvement of the system. Following points must be considered at the time.

- a. Designing of data entry method.
- b. Examination of data check method for data entry using computer and the designing of overall reliability of the data.
- c. Designing of master file for personnel administration.
- d. Code design and standardization.
- e. Processing method of on-demand information retrieval.

One systems engineer is required for the development and operation of this system module.

(3) Programmers

Programmers are to develop the user programs after the system design is completed. At this time, the following points must be considered.

- a. Logical data check method.
- b. Designing of personnel administration master file for performing random access processing.
- c. Programming method for information retrieval.

Two programmers will be necessary when considering the scale of development of this operation.

8-2-6. Implementation Schedules

When the plan for this system is formed based on the above-mentioned considerations, implementation schedule of the information system can be planned as shown in the bar chart hereinafter. The operations relating to the installation of hardware are scheduled in the same manner as that mentioned in the master plan study. The schedule of other operations were determined in reference with the operations relating to the installation of the hardware.

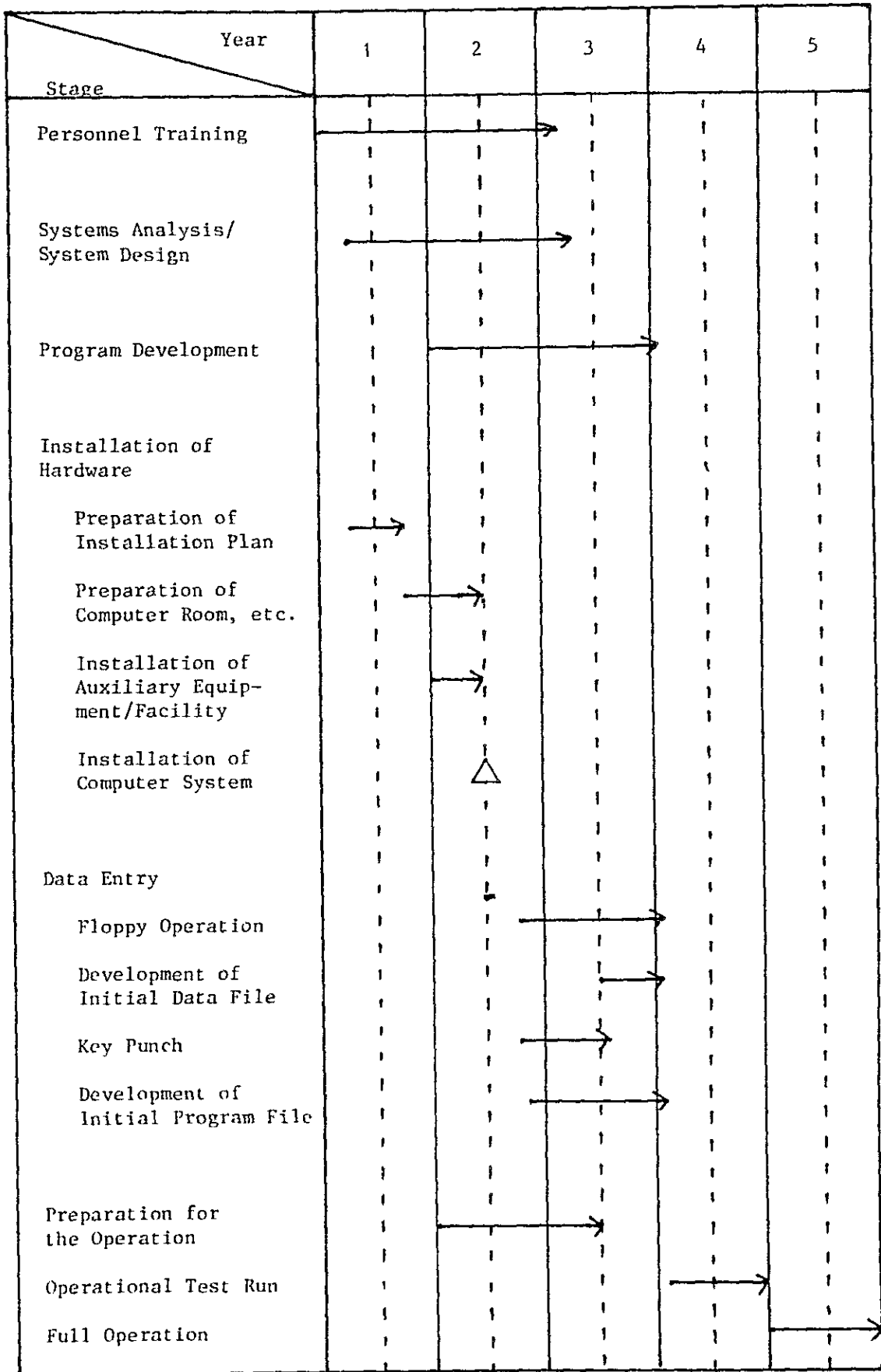


FIGURE: Installation Schedule

This operation will be the first "on-the-job training" to be provided for the systems analyst.

The following shows the detailed schedule for personnel training.

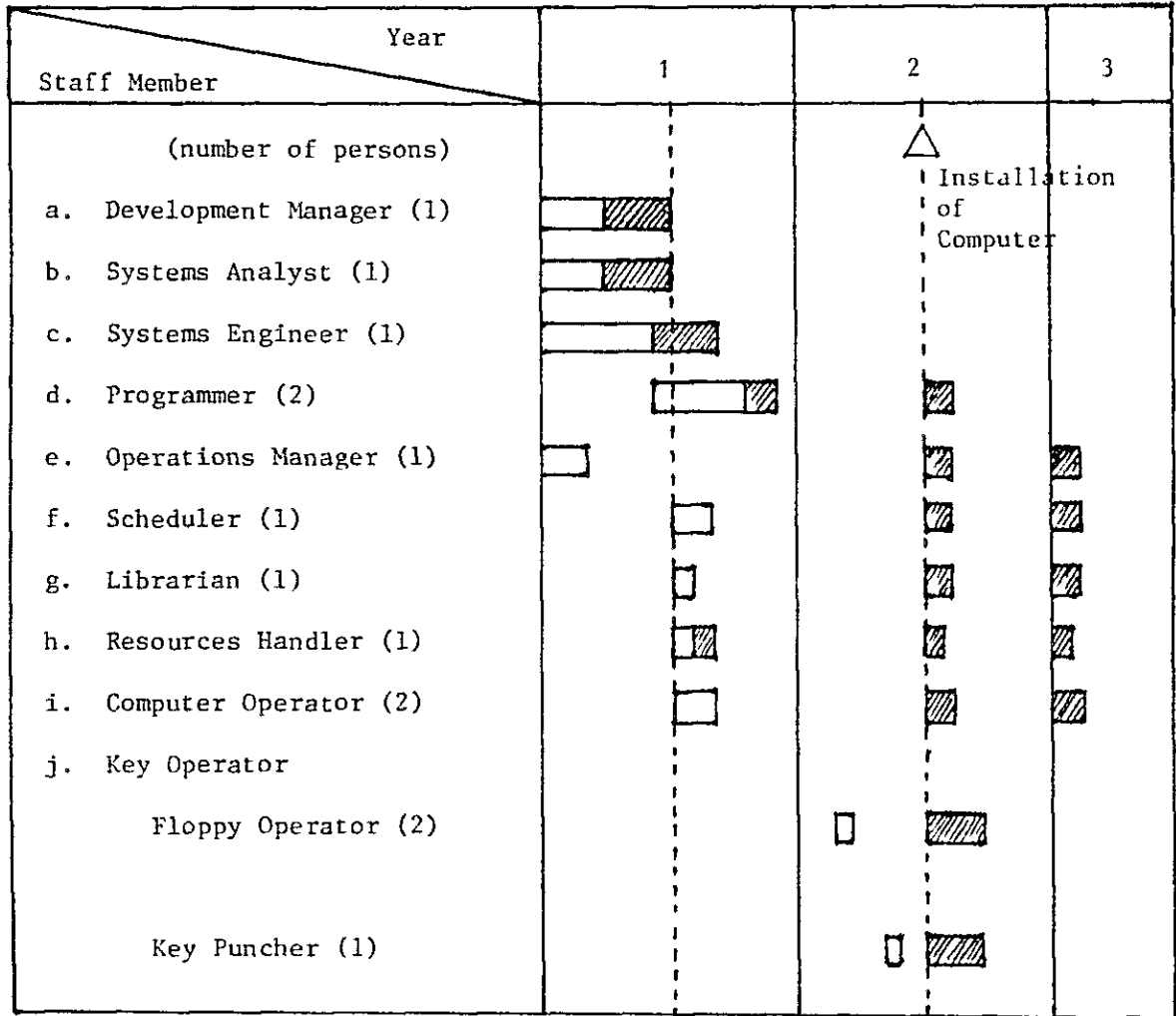


FIGURE: Staff Training Schedule

Legend: : Staff Training Curriculum
 : On the Job Training

8-2-7. Cost Estimates

(1) General

Costs incurred for the introduction of this system module will be estimated.

Following cost estimates are all based on the current export prices effective in Japan. The table below summarizes the rough estimates of the cost.

TABLE: Cost Estimates

Item	Initial Cost	Operating Cost (annual)
Hardware	¥644,800,000 (\$2,579,200)	¥21,000,000 (\$84,000)
Software		
Basic Software	¥10,000,000 (\$40,000)	¥700,000 (\$2,800)
Application Software	¥12,000,000 (\$48,000)	¥890,000 (\$3,560)
Personnel Training		
Instructor Fees	¥22,750,000 (\$91,000)	-
Teaching Material Costs	¥366,100 (\$1,464)	-
Others		
Development Cost of User Program	¥1,486,000 (\$5,944)	¥785,800 (\$3,143)
Development Cost of Data Files	¥1,038,000 (\$4,152)	
Furnishings	¥1,172,000 (\$4,688)	-
Total	¥693,612,100 (\$2,774,448)	¥23,375,800 (\$93,503)

Breakdown of each item is shown hereinafter. The conditions for the estimation are the same as in Chapter 7.

(2) Hardware

Following are the costs incurred for the purchase, installation, and operation of the hardware. Costs concerning the space for the installation of the hardware and other internal fees such as the personnel expenses will not be included.

TABLE: Cost Estimation for the Hardware

Item	Volume	Initial Costs (purchase price)	Operating Costs (annual)	Remarks
Central Processing Unit	1 (unit)	¥86,000,000 (\$344,000)		2MB
Card Reader Unit	1	¥11,000,000 (\$44,000)		
Floppy Disk Reader Unit	2	¥10,000,000 (\$40,000)		1MB/floppy
Line Printer Unit	1	¥38,000,000 (\$152,000)		
Disk Pack Unit	3	¥60,000,000 (\$240,000)		300MB/unit
Magnetic Tape Unit	3	¥44,000,000 (\$176,000)		6,250 BPI
Key-to-Floppy Disk Unit	2	¥2,800,000 (\$ 11,200)		1MB/floppy
Key Punch Unit	2	¥7,000,000 (\$ 28,000)		
CRT Display Unit	2	¥5,000,000 (\$ 20,000)		
	(set)			
Constant Voltage Device	1	¥80,000,000 (\$320,000)		
Air Conditioning Equipment	1	¥31,000,000 (\$124,000)		
Construction Cost of Computer Room, etc.	1	¥244,000,000 (\$976,000)		
Cost for Transportation, Installation, and Adjustment	1	¥20,000,000 (\$ 80,000)		
Ocean Freight and Insurance	1	¥6,000,000 (\$ 24,000)		
Maintenance Fee for Equipment	1		¥21,000,000 (\$84,000)	
Total	-	¥644,000,000 (\$2,576,000)	¥21,000,000 (\$84,000)	

(3) Software

Costs of only the softwares introduced from external organizations will be estimated so that the internally developed user programs will be excluded.

TABLE: Cost Estimation of Softwares

Software	Initial Costs (purchase price)	Operating Costs (annual maintenance fee)
Basic Software	¥10,000,000 (\$40,000)	¥700,000 (\$2,800)
Operating System	¥8,000,000 (\$32,000)	¥550,000 (\$2,200)
COBOL Compiler	¥2,000,000 (\$8,000)	¥150,000 (\$600)
Application Program	¥12,000,000 (\$48,000)	¥890,000 (\$3,560)
Linkage Editor	-	-
Editor/Screen Editor	¥2,000,000 (\$8,000)	¥150,000 (\$600)
Program Source Code Management System	¥2,000,000 (\$8,000)	¥150,000 (\$600)
Screen Image Definition Program	¥4,000,000 (\$16,000)	¥300,000 (\$1,200)
Software Testing/Evaluation Tool	¥2,000,000 (\$8,000)	¥150,000 (\$600)
SORT/MERGE Program	¥1,000,000 (\$4,000)	¥70,000 (\$280)
FILE UTILITY	¥1,000,000 (\$4,000)	¥70,000 (\$280)
Total	¥22,000,000 (\$88,000)	¥1,590,000 (\$6,360)

(4) Staff Training

Only the initial costs incurred for the personnel training curriculum will be examined. If foreign instructors are to be invited, the travelling expenses and the living expenses must also be taken into consideration for the cost estimation.

TABLE: Fees for the Instructors and Cost for the Textbook

Curriculum	Instruction Fees					Cost for the Text Books	
	Duration of One Course	Number of Attendants	Fee per Course	Number of Course Required	Total Fee	Unit Price	Amount
Basic Mathematics/ Statistics	(weeks) 4	(person) 4	¥1,000,000 (\$4,000)	3	¥3,000,000 (\$12,000)	¥10,000	¥40,000 (\$160)
Systems Engineering	2	3	¥500,000 (\$2,000)	3	¥1,500,000 (\$6,000)	¥5,000	¥15,000 (\$60)
Introduction to Information Processing	1	14	¥250,000 (\$1,000)	7	¥1,750,000 (\$7,000)	¥2,500	¥35,000 (\$140)
Systems Analysis, Design, Evaluation Techniques	2	3	¥500,000 (\$2,000)	3	¥1,500,000 (\$6,000)	¥5,000	¥15,000 (\$ 60)
Programming Language/ Programming Techniques	8	4	¥2,000,000 (\$8,000)	3	¥6,000,000 (\$24,000)	¥20,000	¥80,000 (\$320)
Introduction to Hardware	1	14	¥250,000 (\$1,000)	7	¥1,750,000 (\$7,000)	¥2,500	¥35,000 (\$140)
Concept of the Operating System	1	8	¥250,000 (\$1,000)	5	¥1,250,000 (\$5,000)	¥2,500	¥20,000 (\$ 80)
Production Management of Software	2	6	¥500,000 (\$2,000)	5	¥2,500,000 (\$10,000)	¥5,000	¥30,000 (\$120)
Project Management Techniques	2	3	¥500,000 (\$2,000)	3	¥1,500,000 (\$6,000)	¥5,000	¥15,000 (\$ 60)
Management of Computer Room and Resources	1	4	¥250,000 (\$1,000)	1	¥250,000 (\$1,000)	¥2,500	¥10,000 (\$ 40)
Operation of the Computer System	2	3	¥500,000 (\$2,000)	1	¥500,000 (\$2,000)	¥5,000	¥15,000 (\$ 60)
Key Operation	1	9	¥250,000 (\$1,000)	5	¥1,250,000 (\$5,000)	¥2,500	¥22,500 (\$ 90)
Total	-	-	-	-	¥22,750,000 (\$91,000)	-	¥332,500 (\$1,330)

TABLE: Costs for Programming Exercise

Item	Unit Price	Volume	Amount
Coding Sheet	¥200	8 volumes	¥1,600 (\$ 6.4)
Punch Card	¥1.5	8,000 sheets	¥12,000 (\$ 48)
Form Sheet	¥4,000	1 packages	¥4,000 (\$ 16)
Floppy Disk	¥3,000	2 sheets	¥6,000 (\$ 24)
Total	-	-	¥33,600 (\$134.4)

(5) Other Items

The following tables show the costs of the fixtures and computer supplies necessary for the development of user programs and initial data files.

If the programming of user programs are to be sub-contracted to an external organization, an additional ¥60,000,000 (only for the personnel expenses) would be necessary.

TABLE: Other Initial Costs

Item	Unit Price	Development Cost for User Program		Development Cost of Initial Data Files		Cost for Fixtures	
		Volume	Amount	Volume	Amount	Volume	Amount
Coding Sheet	(yen) ¥200	40	¥8,000 (\$ 32)	27	¥216,000 (\$864)		
Punch Card	¥1.5	40,000	¥60,000 (\$240)	-	-		
Form Sheet	¥4,000	2	¥8,000 (\$ 32)	2	¥8,000 (\$ 32)		
Floppy Disk	¥3,000	-	-	32	¥96,000 (\$384)		
Disk Pack	¥700,000	2	¥1,400,000 (\$5,600)	1	¥700,000 (\$2,800)		
Magnetic Tape	¥5,000	1	¥5,000 (\$ 20)	2	¥10,000 (\$ 40)		
Document File	¥1,000	5	¥5,000 (\$ 20)	8	¥8,000 (\$ 32)		
Card Cabinet	¥150,000					1	¥150,000 (\$600)
Magnetic Tape Cabinet	¥110,000					1	¥110,000 (\$440)
Floppy Disk Cabinet	¥42,000					1	¥42,000 (\$168)
Disk Pack Cabinet	¥170,000					1	¥170,000 (\$680)
Document Cabinet	¥70,000					1	¥70,000 (\$280)
Shredder	¥630,000					1	¥630,000 (\$2,520)
Total	-		¥1,036,000 (\$5,944)		¥839,000 (\$4,152)		¥1,172,000 (\$4,688)

TABLE: Other Running Costs

Item	Unit Price	Volume	Amount
Coding Sheet	¥200	14 volumes	¥2,800 (\$11.2)
Punch Card	¥1.5	10,000 sheets	¥15,000 (\$ 60)
Form Sheet	¥4,000	4 packages	¥16,000 (\$ 64)
Floppy Disk	¥3,000	3 sheets	¥9,000 (\$ 36)
Disk Pack	¥700,000	1 unit	¥700,000 (\$2,800)
Magnetic Tape	¥5,000	1 reel	¥5,000 (\$ 20)
Document File	¥1,000	2 volumes	¥2,000 (\$ 8)
Ink Ribbon	¥6,000	6 pieces	¥36,000 (\$144)
Total	-	-	¥585,800 (\$3,143.2)

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

Establishment of an information system is expected to prove very significant by means of increasing the efficiency of the administration of the Department of Trade and Cooperatives, and also by means of providing the Department with various basic information relating to the administrative planning and policy making. However, the foundations for establishing an information system such as the infrastructure, organization, staff, and data management system is not satisfactory at the mean time. For effective use of the computer, and for formulating a useful information system, the following points must be considered.

(1) Establishing an Functional Framework for the Promotion of the Systematization

Above all others, a functional framework entrusted with a strong authorized power for the promotion of the systematization must be established. Details of this functional framework is as already described in Chapter 6. Especially, the Chief Executive for the systematization must be entrusted with positive responsibility and authorized power for carrying out the task from the overall point of view of the Department. Furthermore, the Steering Committee must function as a strong counseling committee to the Chief Executive for the systematization.

(2) Establishing Internal Rules

Next thing to be considered is to establish internal rules of the Department of Trade and Cooperatives in order to authorize the activities of the personnel engaged in the promotion of the

systematization and the functional framework. Furthermore, it is an important factor that various internal rules of the Department will be established for carrying out the system plan and its execution.

(3) Training of Staff

The development of the information system should generally be performed by a group of staff mainly consisting of the personnel who will be the users of the information system. Therefore, the training of all of the staff engaged in the promotion of the systematization is a key factor and an urgent need.

It is an important task to analyze the activities of each operation for the computerization. But it must also be analyzed to seek what kind of an information system is desired from the point of requirements by the entire Department of Trade and Cooperatives. Training of staffs who can make decisions concerning the information system from the point of view of the entire Department is highly desired.

(4) Establishing a System for Data Collection

Establishment of a data collection system is the basic condition for the information system. Therefore, a positive route for receiving the data must be established. For those necessary data which cannot be obtained within the Department of Trade and Cooperatives, close relation with other organizations (especially with C.B.S., the Department of Agriculture, the Department of Industry, the Department of Finance, the Central Bank, and the Department of Transport and Perumtel) should be established, and it should be made possible to obtain the data in the form of magnetic tapes or floppy disks as soon as possible.

(5) Improving the Condition of the Data

If the reliability and the thoroughness of the data is not sufficient, the system will not work well even if the system itself is entirely capable of processing the information. The following points should be considered:

- i. To establish a system to check the data at each provincial trade/cooperatives office, operation unit, and operations group (data cleaning).
- ii. For the staff of the operations group to understand the contents and conditions of the data.

(6) Cooperation between the Development and Operations Group

For the efficient promotion of the information system, cooperation between the operations group undertaking the external negotiations, budgeting, hardware planning, data management, and the development group undertaking system development, system maintenance is required.

(7) Importance of Development of User Programs

For establishing the information system, many user programs will have to be developed by themselves and a large number of manpower must be allocated for this. Although almost all computer makers supply basic software and application programs to their users, many user programs must be developed to satisfy particular applications and need.

According to the initial estimate of the Master Plan Team, there will be a large number of developmental staff and a large number of manpower required. Therefore, training of the developmental staff, software development management staff will be very important factors in the system development.

(8) Positioning of the User Group

For the efficient promotion of the information system, not only the efforts by the systematization group, but also the cooperation of the user group of the information system will become necessary. The user group is not only responsible for providing the high quality data for the information system but also in a position to utilize the output information. In this sense, the promotion of the systematization will be based on the needs of the user group, and therefore, the information system must be made open to the user group.

(9) The importance of Utilizing Policy Planning Information

The basic purpose of establishing an information system is to utilize its output information. The input/output information covered in this Master Plan Study does not cover the entire information being managed by the Department of Trade and Co-operatives, however, it does cover many important information. And these information include many type of information relating to the short and long term policy planning. Therefore, it can be said that this information system will be the first step in establishing a data base on trade statistics and a system with various information processing functions, which is so called a "policy planning information system".

(10) Processing Capacity of the Information System

It is likely that new requirements for the information system will be raised by the user group as the information system will be utilized. The hardware described in this Master Plan Study

does not have enough capacity to meet the newly raised requirements. It rather has many limitation for future expansion. This is because this Master Plan is aimed at systematizing only the certain operations of the Department with the minimum hardware requirements. When expanding the system in the future for systematizing other operations of the Department, the effective method of expanding the system must thoroughly be considered. This is also true when introducing on-line processing functions utilizing the terminals other than the batch-processing. The hardware and software mentioned in this Master Plan Study is not meant to meet the requirement for future expansion of the system.

In the future, the following items must also be considered after the Master Plan has been successfully implemented.

(1) Training of the Computer Users of Each Operation Unit

It has been proposed in the concept of the Master Plan Study to train a small number of full time staffs. When the staffs have acquired thorough knowledge of the information system, then guidance and promotion on computer use must be conducted for computer users of each operation unit to further expand its use.

(2) Data Communication between the Head Office and Provincial Trade/Cooperatives Offices

When data communication networks which can transmit computer information has been completed, data entry from each provincial trade/cooperatives office using the communication network would be the desirable way when considering the operations of the Department of Trade and Cooperatives. It would be possible to retrieve and view the data filed at the Head Office with the CRT display units. In this case, training of the provincial trade/cooperatives office staff would be required and additional support equipment would have to be installed.

(3) The Service for Furnishing the Instant Information to the Head Office

It has been proposed in the Master Plan Study to retrieve and display a part of the contents of the data file on the CRT display units. However, such use of the equipment is limited in the configuration of the hardware. If a magnetic disk unit with a large capacity were to be installed, statistical information were to be constantly filed, and on-line CRT display units were to be installed at the Head Office, management could

retrieve the updated statistical information and be able to have the latest data at all times.

(4) Future Planning for Statistical Information to Perform High Degree of Usage

It will be possible to install additional peripheral equipment to perform complicated calculations and analysis with the statistical information recorded for policy making and administrative affairs. In this case, it will be necessary to strike a balance between filing of the various types of statistical information, the performance of statistical analysis, and simulation of analytical capabilities.

APPENDIX

LIST OF REFERENCE MATERIALS

<u>Ref. No.</u>	<u>Title of Materials</u>
I-1	Agenda of the Meeting with the Japan Team
I-2	The Organization Structure of D.T.C.
I-3	Indonesian Technical Team
I-4	Development Rate of Price Selected Commodities in International Market
I-5	Persentase Perubahan IHK
I-5-2	Kenaikan Nilai Konsumsi per Komoditi
I-5-3	Ranking Andil Komoditi/Jasa
I-6	Perkembangan Harga Eceran 9 Bahan Pokok dan Bahan Penting Lainnya di Seluruh Indonesia
I-7	Contoh: Bentuk Laporan Kandag/Kabupaten Kepada Kanwildag/Propinsi
I-7-2	Laporan Bulanan
I-7-3	Laporan Mingguan
I-8	Jumlah Pengadaan Semen Produksi Dalam Negeri dan Impor Selama Periode 1981
I-9	Daftar: Laporan Bahan Pokok Yang Sangat Penting
I-10	Surat Izin Pengangkutan Antar Pulau
I-11	Banyaknya Perusahaan Perdagangan Menurut
I-11-2	Surat Permohonan Izin Usaha
I-12	Buku Pedoman Pengajuan Permohonan, Penanganan dan Pengeluaran Surat Izin Usaha Perdagangan
I-13	Certificate of Origin Form X
I-13-2	Surat Persetujuan Ekspor Lada
I-14	Impor/Ekspor 1980 (C.B.S. Statistics)

<u>Ref. No.</u>	<u>Title of Materials</u>
I-15	Realisasi Ekspor Kopi Berdasarkan SKA Form X (Computer Output Form)
I-16	Penetapan Harga Patokan Barang Barang Ekspor
I-17	Design Output for "List of Personnel," etc.
I-18	Performance of Cooperatives in Indonesia by Province
I-19	Computer Output for Foreign Trade
IA-1	Design Output for Registration of Enterprises
IA-2	Commodity and Information Flow of Cement
IA-3	Commodity and Information Flow of Clove, Copra, Cooking Oil
IA-4	Commodity and Information Flow of Fertilizer
IA-5	Surat Izin Pengangkutan Antar Pulau (Minyak Kelapa)
IA-6	Surat Izin Pengangkutan Antar Pulau (Cengkeh)
IA-7	Telex (Stock of Cement)
IA-8	Telex (Auction of Clove)
IA-9	Telex (Price of Commodities)
IA-10	Telex (Stock of Fertilizer)
IA-11	Memorandum of Commodity and Information Flow of Fertilizer
IA-12	Badan Pengurusan Kopra Lembar Disposisi
IA-13	Memorandum: Laporan Mingguan Mengenai Perkembangan Harga dan Pengadaan Minyak Goreng dan Bahan Bakunya
IA-14	Memorandum of Design Output for "List of Company"
IA-15	Card Layout for Personnel
IA-16	Data Perorangan Pegawai Departemen Perdagangan dan Koperasi
IA-17	Rank and Classification of Personnel (Civil Servant)
IA-18	Jumlah Pegawai Departemen Perdagangan dan Koperasi Menurut Status Kepegawaian

<u>Ref. No.</u>	<u>Title of Matirials</u>
IA-19	Computer Output for Personnel
IA-20	Design Output for "List of Personnel" (New)
IA-21	Design Output for "List of Personnel" (Old)
IA-22	Aturan Editing & Coding Data Kepegawaian
IA-23	Design Output for Inventory Administration
IA-24	Rekapitulasi Daftar Inventaris Barang-Barang Milik/ Kekayaan Negara
IA-25	Laporan Triwulanan Pelaksanaan Proyek
IA-26	Evaluasi Proyek
IA-27	Rekapitulasi Pelaksanaan
IA-28	Proyek Pembangunan dan Pengembangan Pusat Pelayanan Koperasi Kanwilkop DKI Jakarta
B-1	Commodity and Information Flow of Coffee
B-2	Standar dan Pengawasan Mutu
B-3	First Copies of Certificates of Origin in Form 0
B-4	Volume and Value of Coffee Exported (Monthly Report)
B-5	Information Flow of Consumer Price Index
B-6	Commodity and Information Flow of Pepper
B-7	Surat Persetujuan Ekspor Lada
B-8	Pengembangan Sistem Manajemen Informasi dan Komputeri- sasi Data Perdagangan
B-9	Daftar Eksportir Lada Hitam -- Terdaftar di Propinsi Lampung
B-9-2	Realisasi Ekspor Lada Hitam -- Propinsi Lampung Thn 1980/81
B-10	Daftar Realisasi Ekspor Lada Putih Indonesia per Negara Tujuan (1977-1980)
B-11	Mengkaji Pelaksana Ekspor Lada Putih Indonesia dari Bangka/Belitung dan Kalimantan Timur
B-12	Daftar Importir Terdaftar Pelumas Yang Telah Diberi Pengakuan Definitif

<u>Ref. No.</u>	<u>Title of Materials</u>
B-13	Indeks Musim Harga
B-14	Karet Konvensional
B-14-2	Harga Patokan Barang-Barang Ekspor
B-15	Pengakuan Sebagai Eksportir Terdaftar Kayu Bulat
B-15-2	Surat Persetujuan Realisasi Ekspor Kayu Bulat
B-16	Pengeluaran Realisasi SPREK(b) per Propinsi
B-17	Pemberitahuan Ekspor Barang (E-3 Form)
B-18	Weekly Report of Price Quotation
B-18-2	Retail Price Quotation Report (Half-monthly)
B-18-3	Monthly Report of Retail Price Quotation
B-18-4	Computer Output for Consumer Price Index (Obtained from C.B.S.)
B-19	Statistic of Cooperatives Societies in Indonesia 1977
B-19-2	Buku Pegangan Petugas
B-20	Design Output for Cooperatives
B-21	Daftar Pengumpulan Data I
B-22	Computerization of Data Required by the Coordinating Team of the Middle East
B-23	Information Flow of Middle East
B-24	Daftar: Pengiriman Tenaga Kerja Indonesia ke Luar Negeri
B-25	Daftar: Pengiriman Tenaga Kerja Indonesia ke Luar Negeri
B-26	Pengiriman Tenaga Kerja ke Timur Tengah
B-27	Pengiriman Tenaga Kerja Indonesia ke Timur Tengah Dibidang Kontrakting
B-28	Indonesian Work Force in the Department of Man Power
B-29	Tanda Pengenal Pengakuan Importir
B-30	Pengakuan Sebagai Importir Terdaftar Pelumas
B-30-2	Pengakuan Sebagai Importir Pelumas Terdaftar Sementara

<u>Ref. No.</u>	<u>Title of Materials</u>
B-31	Pemberitahuan Pemasukan Barang Untuk Dipakai
B-32	Design Output for Lubricating Oil
B-33	Materials about Import of Steel Billet
B-34	Kartu Angka Pengenal Eksportir
B-35	Pemberitahuan Ekspor Barang (PEB)
B-36	Formulir Pengumpulan Data (Bulanan)
B-36-2	Formulir Pengumpulan Data (Tahunan)

