

Even so, unlike 'miscellaneous' schools, the teaching companies need not be managed in a uniform manner. They only need to be managed while making necessary improvements along the way.

Therefore, it is important to start the project on a very small scale and with a small number of persons and put it into effect without delay. The point is to continually exchange information about any problems and make necessary improvements so as to execute this proposal successfully.

(4) Reformation of BLKs (Public Vocational Training Centers)

1) Background

A lasting EM fostering system for both the supply and demand sides can be established by implementing the EM Educational Reform described in 3.3.(1) and the Job Organization Model described in 3.3.(2). In this system, promoting in-house training is a supplementary measure for the EM demand side. Therefore, some supplementary measure must also be provided for the EM supply side as soon as possible.

The Study Team recognizes that the BLK, whose reason for existence has been questioned despite its activities at 153 places throughout the country, is a resource which can effectively be utilized for the above purpose. By having the BLK re-assume the role of forming EM human capital which can hardly be achieved by the educational/training institutes that are under the jurisdiction of the Ministry of Education and Culture, the supply of EM should be expanded in terms of both quality and quantity.

2) Outline of the proposal

a. Necessity for BLK Reformation

- The vocational training currently provided in the BLKs is confined within the limit of basic vocational training, the contents of which are uniform throughout the country. It cannot be said, therefore, that the present vocational training always meets the needs of local industries or conforms to the specific characters of localities.

Besides, the revision of curriculums that is needed to respond to the

sophistication of industry has seldom been made. As described in Part II of this report, Indonesia will be faced with a serious shortage of skilled workers and technicians, in the future.

In order to cope with the predicted shortage of skilled and semi-skilled workers and technicians, the existing BLKs shall be restructured into training institutes which foster skilled and semi-skilled workers and candidate technicians and which pave the way for hard-working trainees to become technicians. They shall not only train their students but also re-educate and train more EM of companies than before. In this way, they should be able to help dissolve the problem of shortage in the future.

- Each BLK shall be positioned as a partner to industries (especially, small and medium-sized companies) in its locality in their efforts to develop technology. In order to make it an institute which helps activate the local industries and develop supporting industries, the BLK shall be provided with new functions which are needed to respond to the new schemes of SSTC (Specialized Skill Training Center) and EM Supply-Demand Information System, as well as a new technical support function and a more efficient human resources development function based on improved curriculums. This enables the BLKs to foster EM who meet specific needs and characteristics of local industries.

Since all the BLKs scattered throughout the country cannot be reformed at a time in view of budget, it is advisable first to designate several model BLKs (say, 2 large BLKs, 2 medium-sized BLKs, and 2 small BLKs) and reform them and then to spread the reformation gradually to the remaining BLKs during 10 years while monitoring the conditions of the model BLKs.

b. New functions of new BLK⁸² (SSTC)

New BLKs (SSTC) provide the following functions.

- Function for Specialized Skill Training Center

Since each of the new BLKs is to provide training under the SSTC system described in 3.3.(1) "Reform in the Education of EM" the functions of the existing BLKs need to be adapted to the new system.

⁸² Japan's prefectural industrial research institutes contribute much to the development of local industries, especially the growth of small and medium-sized enterprises. Effective functions to Indonesia which those institutes possess are chosen.

- Training period

Under the SSTC system, the period of training to qualify for the skill examination by the National Vocational Training Council (NVTC) shall be one year for the basic class, two years for the intermediate class, and three years for the advanced class. In the existing BLK, taking the machining course—one of its mechanics courses—as an example, the training period is 600 hours (3 months) for the basic class, 600 hours (3 months) for the intermediate class, and 600 hours (3 months) for the advanced class, each lesson being 45 minutes including practical training. Thus, the period required to complete the full course, from the basic class to the advanced class, is nine months. Therefore, it is necessary to extend the period of training for each of the classes.

- Review of curriculum

With the extension of the training period, the curriculum needs to be reinforced. In this case, it is important to include linguistics (English, in particular) in the new curriculum. In addition, in the curriculum for the NVTC advanced class of the mechanics course and electric/electronics course, respectively, training in CAD and CAM needs to be included.

- Objective of training

The objective of training is to make junior high school graduates qualified as candidates for skilled or semi-skilled workers in the future. In the training, it is very important to foster EM who are equipped not only with good "*Head*" and "*Hand*" but also with admirable "*Heart*," that is, highly motivated EM. For this purpose, emphasis shall be placed on reinforcing basic abilities in mathematics, science, linguistics, information literacy, etc. In addition, subjects reflecting local industrial characteristics shall be incorporated in the curriculum (correspondence to "*Head*").

The hours of training in practical work shall be increased so as to enable the trainees to operate various types of equipment and devices after graduation (correspondence to "*Hand*").

It is essential for students to strive themselves for mastering new technologies as own skills, which is necessary for development of industrial technology of Indonesia. Therefore, it is important to inspire the BLK students with the idea that the future of Indonesian industry depends upon them (correspondence to "*Heart*").

- Function for re-education of EM of small and medium-sized companies

The new BLK shall be equipped to provide re-education to EM of business enterprises, especially to EM of small and medium-sized companies. Budgetary constraint, lack of experimental equipment or instruments and instructors deprive of the opportunity for small and medium-sized companies' EM to be re-educated in their own companies. Accordingly, it is very important for the new BLK to provide them with chance of re-education positively instead of the companies. The service by the new BLK should be enlarged and diffused through publicity.

- **Function for technical support**

In order to help small and medium-sized enterprises develop their own technologies and new products, increase their technical strengths, the BLKs shall provide comprehensive technical support, which includes conducting testing for them, giving technical counseling and guidance, supplying technical information, and holding lecture meetings and seminars.

- **Conducting consigned tests and processings**

When a BLK is asked from any enterprise to test or inspect the quality, accuracy, composition, etc. of a particular material or product, it shall carry it out and prepare a test (inspection) report on a chargeable basis. Also, when requested from any enterprise, the BLK shall allow the enterprise to use its equipment or devices for processing, measurement, analysis, etc. on a chargeable basis.

- **Providing guidance in local industrial technology**

In close cooperation with commercial and industrial associations in its locality, each BLK shall hold technical counseling meetings, technical guidance tours, technical lecture meetings, etc. to promote the technical exchange in the locality.

- **Function for the EM Supply-Demand Information System**

Since each of the new BLKs is to serve as one of the bases of operation of the EM Supply-Demand Information System described in 3.3.(5), it needs to have new functions (facilities and human resources), including the following items, which are required of a base of supply and exchange of information.

Examples of items of information to be supplied/exchanged:

- Information on the contents of training at the new BLKs and the characteristics of each individual BLK

- Information on the number of new BLK graduates and the places of

- employment for each of the NVTC Basic, Intermediate, and Advanced classes.
- Information on small and medium-sized enterprises in particular localities
- Information on job offers from various enterprises
- Information on meetings for presentation of research papers, seminars, etc. on technical development
- Enhancement of planning and control functions

The planning and control functions of the BLKs shall be enhanced to ensure well-coordinated management of the above functions and to plan and control a comprehensive technical support.

3) Implementation Procedure

a. Model BLK Propulsion Committee

The improvement of technical strength and the fostering of EM in any country cannot be achieved without the cooperation of the government, industry, and academy. In this context, the Model BLK Propulsion Committee shall be composed not only of DEPNAKER—the agency having the chief responsibility for the project—but also of representatives of individual industrial circles, the Ministry of Industry, the Ministry of Education and Culture, BAPPENAS, and other government agencies concerned, and BLKs, as well as persons of learning and experience.

The Committee shall comprise a BLK Model Selection Team, Educational Curriculum Restructuring Team, New Functions Setting Team, and Planning & Control Team (including the planning and control of financial economy). Each team shall investigate and study the matters specified below, and all the teams shall present interim study results and exchange views at a meeting to be held monthly. One year after establishment, the Committee shall, while making necessary adjustments, select several model BLKs equipped with new functions and a new curriculum.

b. Tasks of the Committee

- Model BLK Selection Team

The matters to be considered in selecting model BLKs are as follows:

- Classify the existing BLKs by scale and by industrial category of their locality—manufacturing, agriculture & forestry, fisheries, mining & energy, services,

transportation & communications, etc. (A single BLK may fall into more than one category.)

- Rank the BLKs in each of the categories taking into consideration the industrial and economic importance and characteristics of their localities.
- Finally, select a number of initial BLKs from regions where EM is or will become undersupplied, and rank them again.

- Curriculum Restructuring Team

- Study and formulate a new curriculum appropriate to the new BLKs referring to the curriculum of VET (Vocational Education and Training for Industry Growth now being implemented under the leadership of the Ministry of Education and Culture) to be established in the near future focusing on the skill levels demanded by the industrial world of Indonesia.
- Discuss, and install (if appropriate), new subjects and courses of study adapted to the characteristics of particular local industries (e.g., timber of Kalimantan, machinery and shipbuilding of Surabaya, and fisheries of Sulawesi).

- New Functions Setting Team

- Decide the types of testing and research equipment and devices that the new BLKs must have to meet the needs of local industries and respond to the development of industrial technology. It should be noted that special types of equipment and devices may be needed depending on specific characteristics of particular regions.
- Check the types of equipment and devices which are owned by research institutes, research centers of big companies, universities, polytechnics, etc. in each region (to prevent duplicate investment in costly equipment and devices which are seldom used).

- Planning & Control Team

- Study ways to secure teachers and instructors in diverse fields of specialization. For example, hiring and utilizing those who have studied abroad, inviting foreign lecturers (especially in the early stages of establishment of the new BLKs), and asking teachers of other educational/training institutes for cooperation can be considered as means to re-educate those who are to become teachers/instructors of the new BLKs (e.g., dispatching them to a university, research institute, or teacher training institute at home or abroad or inviting foreign professors/instructors to re-educate them, especially in the early stages of establishment of the new BLKs).
- Formulate a management plan for the New BLK Project (includes studies of

school fee, annual dues payable by companies which consign the training of their employees to BLKs, and menus and system of pricing of testing, research, analysis, processing, etc. consigned to BLKs).

- Investigate the possibility of privatizing the new BLKs in the future on the assumption that they shall eventually be managed by a fund or made to support themselves.

- Make a projection about the number of persons to be trained in the future.

For example, the number of trainees in 1991/1992 was 77,570 (38,465 persons trained within the BLK facilities and 39,105 in the BLK's traveling training vehicles). From this figure, it can be estimated that about 40,000 persons are trained annually within the BLK facilities. Assuming that the number of trainees can be increased 5% annually by expanding the number and capacity of new BLKs, a cumulative total of about 450,000 candidates for technicians and skilled workers will be sent out to Indonesia's society in 10 years after the birth of the new BLKs.

(5) EM Supply-Demand Information System

1) Necessity for EM Supply-Demand Information System

If the exchange of resources between the EM supply side and EM demand side is activated, the strategic goals of "substantialization" and "networking" can be achieved more effectively. Information is the most basic resources exchanged between them. As a basis of the reform in EM education, the diffusion of a job organization model, the promotion of in-house training, the restructuring of BLKs, etc., there must be an infrastructure for the exchange of information. The EM Supply-Demand Information System proposed here supplies information for supporting the human resources development that conforms to the new paradigm of EM education and meets the real needs of enterprises and information for supporting entrepreneurs who should become the core of Indonesia's unique technology-oriented companies in the future.

2) Outline of the Proposal

The EM Supply-Demand Information System offers an environment which makes it possible to easily utilize and exchange information supplied from the EM

demand side, EM supply side, and intermediary.

a. Information supplied

The outline of the information to be supplied from the EM supply side, EM demand side, and intermediary, respectively, is given below.

- EM supply side

Basic information about educational/training institutions, such as the subjects of study and training, contents of education, teaching staff, number of students/trainees, and facilities, and various types of statistical information, such as the condition of employment of new graduates each year.

- EM demand side

Information about companies, such as the contents of businesses, EM job offers, working conditions, in-house training, and job organization.

- Intermediary side

Various types of statistical information about EM compiled by the government agencies concerned; information about policies and budget for EM training; and information about the training and research institutes concerned.

b. Organizations involved and control & management of supply of information

- Control & management of information supply

In order to supply needed information at the right moment, it is necessary to edit the information to be supplied into an easy-to-understand form and update it constantly. Each supplier of information must know the location of information, the time to update it, etc. and collect and supply needed information at the right time. Executing these jobs smoothly requires systematic cooperation between the person in charge of information supply and the departments concerned.

- Organizations involved

Public organizations, educational institutes, enterprises, etc. which shall be involved in the EM Supply-Demand Information System are as follows.

- EM supply side

Universities (science and engineering departments), polytechnics, vocational

high schools, and BLKs.

- EM demand side

State-managed and private enterprises.

- Intermediary side (government agencies)

Central Bureau of Statistics, Ministry of Manpower, Ministry of Education and Culture, Ministry of Industry.

c. Concept of system

Thanks to advances in technology, data processing equipment has dramatically increased in performance and decreased in size and cost. At the same time, data transfer has increased in speed and decreased in cost. As a result, even individual persons can now send and receive data at a reasonable cost.

Under those conditions, the EM supply-demand network offers a mutual information exchange environment in which a transmitter of information can be a receiver of information at the same time.

3) EM Supply-Demand Information System Configuration

The EM Supply-Demand Information System consists mainly of the following three parts:

- Data processing system for supply and exchange of information.
- Data supplied from various sources.
- Control & management of supply of information.

a. Data processing system

The data processing system consists of a computer system for the supply and exchange of information and an information communication network.

- Information communication network

As the information communication network, Internet which is said to have as many as 50,000,000 users around the world shall be used. The main reason for this is that Indonesia already has established an environment for the utilization of Internet. In fact, there are five providers of Internet services in Indonesia. The Ministry of Industry, Central Statistics Bureau and other public organizations, University of Indonesia, Bandung Institute of Technology, some other educational institutes, PT Telkom, and some public research institutes connect to Internet via the IPTEK-net (network for exchange of science and technology information). In addition, there are business enterprises, universities, public

research institutes, etc. which supply information using Internet via another network. By utilizing Internet, it is possible to exchange information even with foreign educational/training institutes, etc. and collect various types of information, including science and technology information, from all over the world.

As the local area network, IPTEK-net shall be used. This network, built for the exchange of science and technology information, is now managed under the government's budget. When the government agencies and other public organizations, including public educational institutes, use this network for the purpose of exchanging scientific or technical information, the communication line can be used free of charge. At present, there is a plan to expand the scope of users of the network services and charge the use of the communication line and services to make the network self-supported in two to three years.

- Computer system functions

The computer used in the EM Supply-Demand Information System is capable of storing, controlling, and supplying information via Internet (See Figure 3.8). It consists of the following hardware and software.

- Software system

The software system comprises an operating system and application programs.

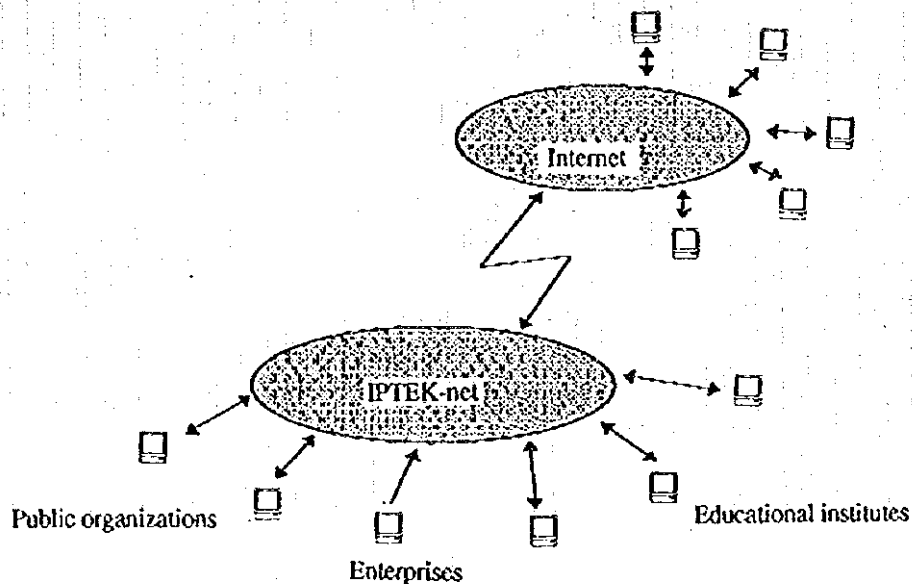


Figure 3.8 Concept of Computer Information Network

- Hardware system

The hardware system comprises a computer for processing, storing, and controlling data and peripheral devices for input/output of data.

b. Supply of information

• Supply side (educational/training institutes)

In the educational world, several universities, including the University of Indonesia and Bandung Institute of Technology, and two high schools have started supplying information using Internet. Other universities, polytechnics, and high schools shall be made to follow suit.

- Installation of job consulting department

A job consulting department for EM shall be installed in each educational/training institute to provide help-wanted information and job counseling to its students/trainees and conduct PR activity addressed to business enterprises. This department shall also investigate the condition of employment of new science and engineering graduates (science and engineering university graduates, technical high school graduates, and vocational training center graduates). A summary of the investigation results shall be submitted to the authorities concerned.

- Management of supply of information (one person for computer operation and one for supplying information)

As a rule, the job consulting department shall be responsible for the supply of information, such as the contents of curriculum, etc. Scientific information, such as research themes and research results, shall be supplied directly from research institutes.

- Information supplied

- o Subjects of studies, numbers of students, facilities, etc. of educational institutes (science and engineering departments of universities, polytechnics, and technical high schools).
- o Personal record, current subject to study, academic achievements, etc. of each professor (for universities and polytechnics)
- o Research papers on science and technology and technical information (for universities)

- o Subjects of training, training staff, etc. of vocational training centers.
- o Statistical information
 - The condition of employment of new graduates shall be investigated every year, and the investigation results shall be reported to the authorities concerned. The Ministry of Education and Culture shall sum up the reports of all the educational and training institutes and publish the summary as annual statistics on the employment of new graduates.
- Demand side (business enterprises and chamber of commerce and industry)
 - In the industrial world too, PT INTI, PT IPTN, PT KRAKATAU STEEL, and other foreign-based companies have started supplying information through Internet. Other companies and organizations shall be made to follow suit.
- Management of supply of information (large companies)
 - Many of large companies use computers to process various jobs, such as business and design calculations. Therefore, the computer environment is satisfactory. With the internationalization of Indonesia's economic and business activities, the utilization of Internet will expand in the future.
- Information supplied
 - o Large companies
 - Company guide, Present condition of in-house training of EM.
 - EM help-wanted information, organization of works
 - o Small and medium-sized companies
 - For economic reasons, it is considered difficult for small and medium-sized companies to make investment necessary for supplying information to the outside. Therefore, universities, polytechnics, and new BLKs shall serve as bases for information transmission for the small and medium-sized companies in their localities. Small and medium-sized companies shall supply help-wanted information, etc. through the chamber of commerce and industry in their locality.
- Intermediary side (public organizations: Central Statistics Bureau, Ministry of Manpower, Ministry of Education and Culture, Ministry of Industry)
 - The Ministry of Industry, Central Statistics Bureau, and other administrative agencies have already started supplying information through Internet. In the

future, more and more administrative agencies will use Internet to supply their information.

- Ministry of Manpower

At present, the Ministry of Manpower is undertaking a plan to implement sophisticated information communications. The system being planned requires the enhancement of existing information service functions (installation of WWW server) based on Internet and the installation of a department responsible for the supply of information. The Ministry shall form a committee for the supply of information to organize EM information it owns and discuss the types of information to be supplied.

o Information supplied

General information, information concerning EM(EM fostering policy, etc.), information about BLKs under the jurisdiction of MOM, statistical information about EM.

o Implementation of the Establishment Survey (to grasp trends of EM employment)

At present, there are few data about the distribution and trends of EM employment in the labor market. In order to allow for periodical Establishment Surveys, the Ministry shall discuss conducting a survey of EM-related enterprises by mailing to each of them a questionnaire containing less questions, and less subject establishments than in the latest detailed survey of 3,000 establishments. By implementing periodical surveys, it becomes possible to early grasp any change at the EM demand side.

The outline of the proposed survey is given below.

① Establishments to be surveyed

200 establishments shall be sampled for each industry sector (50 for large companies and 150 for small and medium-sized companies).

② Questions

Total number of EM employed, number of employees by job type and salaries, number of employees by academic career, recruitment plan, etc.

③ Survey method and frequency

Survey by mailing questionnaire to subjects; survey conducted semiannually

(twice a year).

- Ministry of Industry

The Ministry of Industry has been using Internet to supply information about the Ministry's organization, Indonesia's profile, legislation, trade, investment climate, manufacturing, economy, etc. Therefore, the environment for information services is satisfactory. The Ministry shall discuss supplying the following information taking advantage of its favorable environment.

• Information supplied

Information about EM (EM fostering policy, etc.); statistical information, including industry statistics; information about the vocational training centers and industrial research institutes under the jurisdiction of MOI; information about small and medium-sized manufacturing companies.

- Ministry of Education and Culture

At present, the Ministry is discussing the use of Internet for the management of its information service.

• Information supplied

Information of policy in terms of education system. Information of recruiting fresh graduates given by educational institutions. Information of research institutions under controlled by Ministry of Education and Culture.

- Central Bureau of Statistics(BPS)

At present, the Central Bureau of Statistics uses Internet to supply information about its organization and activities, places of sale and method of supply of statistical publications, as well as statistical information about population, employment, agriculture, manufacturing, etc.

Since the Central Bureau of Statistics has been offering some sorts of information, it must have an established control and management system for the supply of information. It shall, therefore, supply the following additional information.

• Information supplied

Information about EM is compiled from the existing statistical data.

c. Control & management of information supplied

In order to supply useful information at the right time, the person in charge of supplying information must know the locations of information (i.e., the departments holding the information) and the time to update it. Namely, the person who controls and manages the information to be supplied is required to constantly renew the existing information and discard information which has become useless to the users of that information. He is also required to meet the needs of those users as much as possible. To those ends, it is necessary to install a department which is responsible for controlling and managing information in a systematic manner.

- Tasks of information control & management department
 - Controlling the computer system and information to supply.
 - Collecting information on a regular basis in cooperation with the departments holding information.
 - Serving as the window of information service to outsiders (answering inquiries, meeting user needs, handling claims, etc.).

4) Method of implementation

Implementing a nationwide network from the beginning is difficult to implement because of manpower and cost involved. Therefore, in about two years of trial period, the network shall be confined to particular areas, companies, and educational/training institutes. After that, the coverage shall be gradually expanded.

To form this committee, a preparatory committee shall first be organized and trials shall be made.

- Area, companies, and educational/training institutes covered
 - The area covered by the network shall be the Jakarta area, and the companies and educational/training institutes located in that area shall be covered as well. Those companies (non-commerce) and universities which are already using Internet shall also be included.
- Companies and educational/training institutes (none of them has ever used Internet) covered during trial period
 - Companies: 10

- Educational/training institutes: 10 universities, 5 polytechnics , 5 vocational training centers
 - Companies and universities (having science and engineering departments) which are using Internet.
- a. Preparatory committee
- The preparatory committee shall consist of representatives of the Central Statistics Bureau, Ministry of Industry, Ministry of Manpower, Ministry of Education and Culture, and chambers of commerce and industry. In addition, a member of the IPTEKnet staff shall be invited as a technical advisor. The representative of the Central Statistics Bureau which has experience in using Internet to collect and organize information shall assume the post of chairman of the committee. The committee shall designate enterprises (demand side) and educational/training institutes (supply side).
- b. Establishment of committee of specialists
- This committee shall consist of representatives of the Central Statistics Bureau, Ministry of Manpower, Ministry of Education and Culture, Ministry of Industry chambers of commerce and industry, and persons in charge of the educational/training institutes and enterprises that have been designated by the preparatory committee. The chairman of the preparatory committee shall preside over the committee of specialists. As a technical advisor to the committee, a member of the IPTEKnet shall be invited.
- Roles of committee
 - The committee shall discuss necessary information about EM and decide in detail the items of information to be supplied. In addition, it shall ask public research institutes to positively provide research results, papers, technical information, etc.
 - The committee shall provide guidance in the method of building the computer system, and consulting for the selection of optimum hardware and software.
 - The committee shall select areas to which the network is to be expanded after the trial period and review the current plan.
- c. Estimate of cost of building network system

The following estimate assumes that the companies and educational/training institutes covered by the network have their own computer systems (WWW server).

- Cost of building system (30 Education/Training institutes and companies in Jakarta area)

Total approximate cost : \$210,000

Items:

Computer system : \$5,000

System building cost : \$2,000

Cost of one system : \$7,000

Total cost $\$7,000 \times 30 =$: \$210,000

PART IV: TOWARD EM DEVELOPMENT

In response to the request from the Government of Indonesia, this Study was carried out to discuss and formulate plans for the development of engineering manpower (EM) needed for the industrialization of the country, based on the Second Long Term Development Plan (PJP-II) and forecast for industrial development in the future. The results of the Study, as well as problems in promoting the Indonesian EM development plans based thereon, are presented as "Toward EM Development" hereunder.

4.1 Results of the Study

- (1) Through reviews of PJP-II and forecasts of the Study Team, it has been recognized that in order to develop the Indonesian industry, it is imperative to foster EM of sufficient quality in sufficient number according to the stages of development for the take-off of Indonesia aimed at by PJP-II and according to the stages of economic development through 2003/04 and 2018/19.

At present, in Indonesia, which aims to develop industry and reinforce international competitiveness, various measures are being discussed as to how to start a new scheme of vocational education and training for the development of EM amid the basic trends toward deregulation and privatization of state-owned enterprises. With respect to the fostering of EM, the primary objective of this Study, has been to recognize that there are many problems to be solved by close cooperation between the EM supply and demand sides from a long-range perspective.

- (2) The results of the Establishments Survey on the present condition of EM and the EM supply/demand forecasts suggest that though a shortage of candidate engineers in terms of number is unlikely in the future, a serious shortage of technicians in medium and small size enterprise is expected. The Study Team has pointed out the importance of fostering EM equipped with the abilities demanded in each of the stages of development of Indonesian industry.

With respect to the fostering of EM by the industry sector, the Study Team has

suggested that it is important and effective to foster EM in the manufacturing industry, which has great impact on industrial development, and the machinery industry, which helps develop supporting industries.

In addition, the Study Team developed EM supply and demand forecast models, and implemented technical transfer to the Counterpart.

- (3) In propelling the EM fostering plan in the future, it is important to give up the rigid old paradigm and implement a new paradigm. In this respect, the Study Team has set "practical paradigm" and "networking" as the basic strategic goals to be pursued jointly by the EM supply side and demand side.

As execution plans for those basic strategies, the Study Team has made five proposals: the reform in the education of EM, the development of EM job organization models, the structuring of a new scheme of in-house training, the reformation of BLKs, and the building of an EM supply-demand information system.

4.2 Problems to Be Solved for Implementation

- (1) One of the conclusions of the present study is that implementation of the plan to foster EM, largely responsible for the development of Indonesia in the future calls for a changeover from the conventional paradigm to an innovative new paradigm. In order to complete the change and attain the anticipated goals, it is necessary that both the EM supply side and demand side cooperate more closely with each other.

- (2) To that end, it is indispensable to install several committees composed of both sides. Those committees require considerable personnel, money, information and, etc..

Taking the above into consideration, in executing the individual plans, the authorities concerned must take the initiative and seek utmost cooperation of the private sector.

In cooperation with the private persons concerned, they should set about the tasks without delay.

- (3) With the basic philosophy that lifelong education is an essential factor in the fostering of EM, both the EM supply side and EM demand side should, in

cooperation with each other, offer opportunities of education and training in technology and techniques to EM and those who want to join EM in the future.

- (4) The government should, in cooperation with the private sector, institutionalize national certification systems, including a technical qualification system, in diverse new fields from an international standpoint.

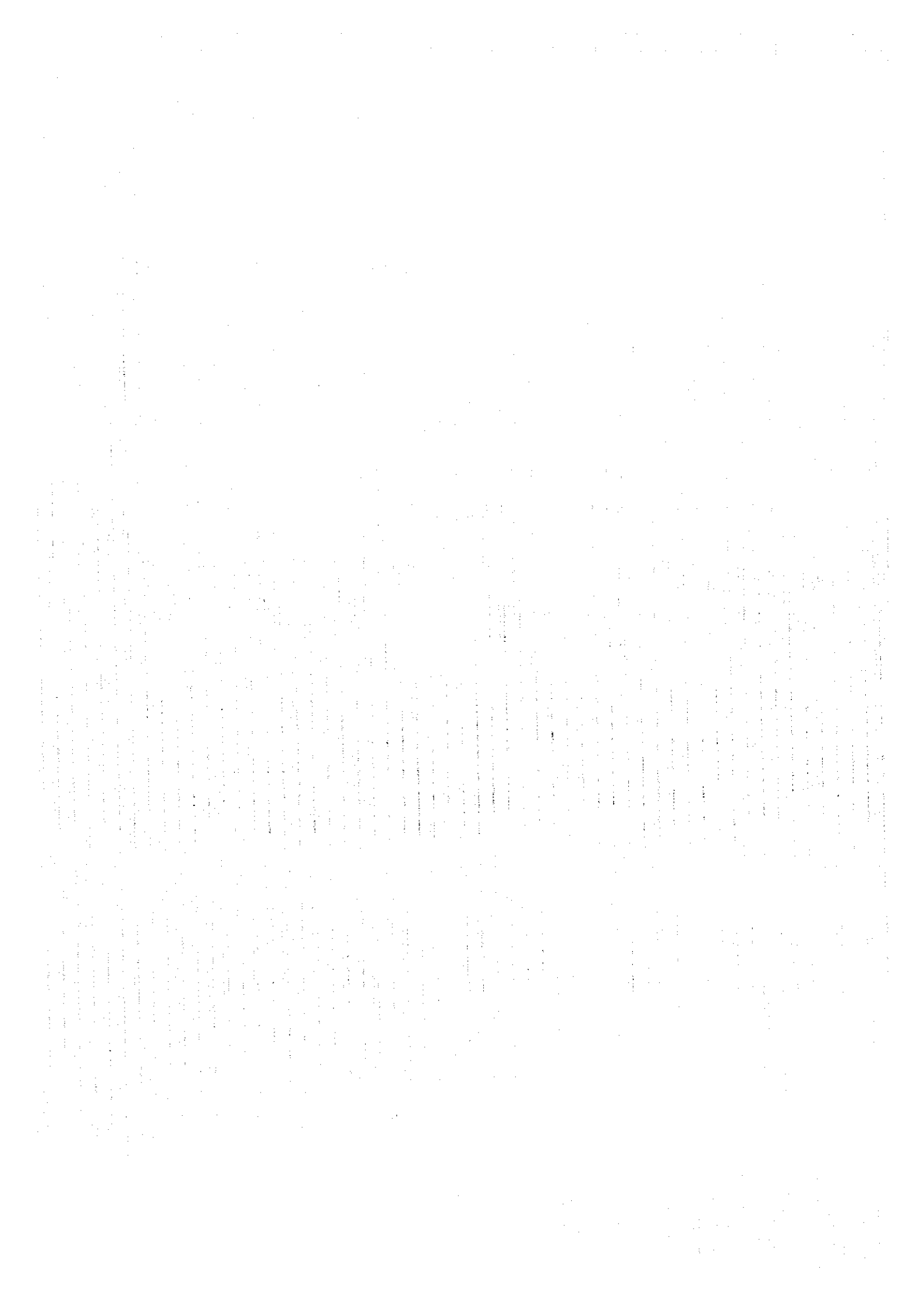
The common certification system for professional engineers (PEs) has become a world trend. In Indonesia too, it is important to establish its PE accreditation system based on the internationally established industrial classification.

- (5) The medium to long-term images forecast in this report are those assumed and presented on the bases of a fact-finding survey conducted in 1994. Any medium to long-term plan is subject to review, hence it is important to make suitable revisions to the above plan according to changes in external factors and other conditions. It should also be understood that the initial plan is positioned as a simulative one for full-scale implementation of the project.

APPENDIX

APPENDIX

	Page
APPENDIX 1	MINUTES OF MEETINGS..... A1-1
APPENDIX 2	GLOSSARY A2-1
APPENDIX 3	DEFINITION OF ENGINEERING MANPOWER A3-1
APPENDIX 4	LIST OF ENTERPRISES AND INSTITUTIONS VISITED AND INTERVIEWEES A4-1
APPENDIX 5	QUESTIONNAIRE (INDUSTRIAL TECHNOLOGY EVALUATION)..... A5-1
APPENDIX 6	POPULATION OF ESTABLISHMENTS A6-1
APPENDIX 7	THE ESTABLISHMENT SURVEY A7-1
	Appendix 7.1 The Establishment Survey Questionnaires (Indonesian English Languages)..... A7-2
	Appendix 7.2 The Establishment Survey Questionnaires (Indonesian Languages) A7-19
	Appendix 7.3 The Establishment Survey's Results A7-36
APPENDIX 8	ESTIMATION OF LABOR PRODUCTIVITY AND IN-HOUSE PROMOTION A8-1
APPENDIX 9	MANUFACTURING INDUSTRY IN INDONESIA AND EDUCATION SYSTEM IN OTHER COUNTRIES IN AISA A9-1
APPENDIX 10	BIBLIOGRAPHY A10-1



Appendix 1

JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

MINUTES OF MEETINGS
FOR
THE INCEPTION REPORT
OF
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY,
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

APRIL 13, 1994, JAKARTA, INDONESIA

The Indonesian Side consisting of the National Development Planning Agency (BAPPENAS) and the Ministry of Manpower (DEPNAKER) (hereinafter referred to as "the Counterpart") and the Japanese Study Team for The Study of Engineering Manpower Development Planning in the Republic of Indonesia (hereinafter referred to as the "Study Team") sent by the Japan International Cooperation Agency agreed on the following items mentioned below after a series of discussions.

The lists of attendants at the meetings are attached in Annex II.

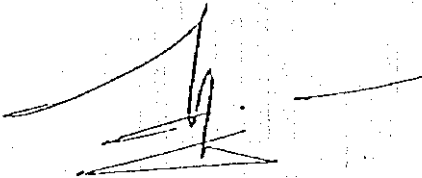
1. The Study Team explained the draft Inception Report which is based on the Scope of Work signed by representatives of BAPPENAS, DEPNAKER, and the Japan International Cooperation Agency on December 7, 1993.
2. After holding a series of discussions, the Counterpart and the Study Team agreed on the contents of the final version of the Inception Report.
3. Based on the above agreement, the Study Team submitted 30 copies of the final version of the Inception Report.
4. The following issues were discussed during a series of meetings:
 - a) DEPNAKER will provide any available data needed for the study, including economic and employment data which was used to produce the 1993 State Guideline, Repelita VI, and PJPTII.
 - b) The Study Team will hold meetings with the Counterpart and report the progress of the Study at appropriate occasions in between the two Interim Reports.
 - c) The Counterpart will provide its experience and knowledge to support the Study Team. The Counterpart will use its local inspector network to support the enterprise manpower survey.

5. As part of its participation in the Study, the Counterpart provided the staff in Annex I to support the study. Both sides confirmed that it is necessary to cooperate with the Ministry of Education & Culture, Ministry of Industry, BPPT, Central Bureau of Statistics, etc., in conducting the Study. DEPNAKER will arrange for the Study Team to obtain cooperation from such agencies.

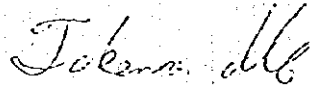
As representatives of the Counterpart and the Study Team, the following signatories agree to the above:

APRIL 13, 1994

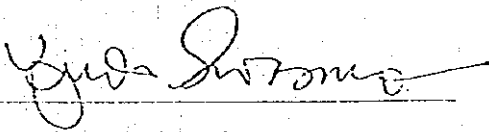
JAKARTA, INDONESIA



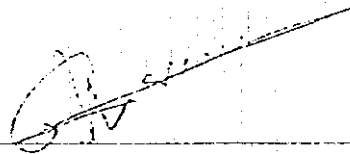
MAMAN SETIAWAN
HEAD, BUREAU OF MANPOWER
& EMPLOYMENT CREATION,
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)



TAKENO MAYUKI
TEAM LEADER
THE STUDY TEAM



YUDO SWASONO
CHAIRMAN
PLANNING & DEVELOPMENT BOARD
MINISTRY OF MANPOWER
(DEPNAKER)



WITNESS: KASAI AKIRA
SPECIAL TECHNICAL ASSISTANT
TO THE PRESIDENT
JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

ANNEX I: LIST OF STAFF PROVIDED BY THE COUNTERPART

Counterpart Staff	Counterpart Department	Study Team Member	Assignment
Yudo Swasono Maman Setiawan	DEPNAKER BAPPENAS	Takeo Mayuki	Team Leader Human Resource Development
Slamet Tjokropranoto Endang Sulistyarningsih Diah Widarti Rahma Iriyanti	DEPNAKER DEPNAKER DEPNAKER BAPPENAS	Endo Aiichiro	Sub Leader Technical education & training development
Diah Widarti Bambang Putratama	DEPNAKER DEPNAKER	Saito Shusei	Macro economy & industry
Godang Sinaga Abdul Malik Suwarno	DEPNAKER BAPPENAS BAPPENAS	Yanagisawa Mitsuyasu	Manpower supply and demand
Maman Suhermanto Chairul Rachmadsyah Fadri	DEPNAKER DEPNAKER DEPNAKER	Narita Hiroatsu	Industrial technology evaluation I (industrial machinery & factories)
Maman Suhermanto Chairul Rachmadsyah Fadri	DEPNAKER DEPNAKER DEPNAKER	Masano Satoru	Industrial technology evaluation II (metals, energy, information systems)
Maman Suhermanto Chairul Rachmadsyah Fadri	DEPNAKER DEPNAKER DEPNAKER	Watanabe Masato	Industrial technology evaluation III (construction, electric power, electronics)
Sinuraya Mohammad Hidayat	DEPNAKER DEPNAKER	Masuya Hitoshi	Computer system development
Zateman Rajaguguk Dafriзал	DEPNAKER DEPNAKER	Shinkaji Hiromitsu	Enterprise survey (A)
Zateman Rajaguguk Dafriзал	DEPNAKER DEPNAKER	Saito, David	Enterprise survey (B)
Soerjotomo Nunik Medyawati	DEPNAKER DEPNAKER	Takeuchi Jimi	Project Support

ANNEX II: LIST OF ATTENDANTS

INDONESIAN SIDE

Drs. Maman Setiawan, MA Head, Bureau of Manpower & Employment Creation
National Development Planning Agency
(BAPPENAS)

Dr. Yudo Swasono Chairman, Planning & Development Board
Ministry of Manpower
(DEPNAKER)

Drs. Soerjotomo DEPNAKER

Slamet Tjokropranoto, SH, MSc DEPNAKER

Dra. Endang Sulistyaningsih, MSc DEPNAKER

Dr. Diah Widarti DEPNAKER

Ir. Daulat Sinuraya DEPNAKER

Drs. Maman Suhermanto DEPNAKER

Bambang Putratama, BSc DEPNAKER

Drs. Dafrizal, MS DEPNAKER

Zaterman Rajaguguk, SH DEPNAKER

Drs. Godang Sinaga DEPNAKER

Chairul Rachmadsyah, BA DEPNAKER

Drs. Fadjri DEPNAKER

Mohammad Hidayat DEPNAKER

Ir. Nunik Medyawati DEPNAKER

Dra. Rahma Iryanti BAPPENAS

Drs. Soewarno BAPPENAS

JAPANESE SIDE

Mr. Kasai Akira

Japan International Cooperation Agency

Mr. Hanatani Atsushi

Japan International Cooperation Agency

Miss Shanti Dewi

Japan International Cooperation Agency, Indonesia Office

THE STUDY TEAM

Mr. Takeno Mayuki

Team Leader / Human Resource Development

Mr. Endo Aiichiro

Sub Leader / Technical Education & Training Development

Mr. Saito Shusei

Macro Economy

Mr. Yanagisawa Mitsuyasu

Manpower Supply & Demand

Mr. Narita Hiroatsu

Industrial Technology Evaluation I

Mr. Masano Satoru

Industrial Technology Evaluation II

Mr. Watanabe Masato

Industrial Technology Evaluation III

Mr. Masuya Hitoshi

Computer System Development

Mr. Shinkaji Hiromitsu

Enterprise Manpower Survey (A)

Mr. Saib, David

Enterprise Manpower Survey (B)

Mr. Takeuchi Jimi

Project Support

JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

MINUTES OF MEETINGS
FOR
THE STUDY PERFORMS IN PHASE I
OF
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

JUNE, 7, JAKARTA, INDONESIA

The Indonesian Side consisting of the National Development Planning Agency (BAPPENAS) and the Ministry of Manpower (DEPNAKER) (hereinafter referred to as "the Counterpart") and the Japanese Study Team for The Study of Engineering Manpower Development Planning in the Republic of Indonesia (hereinafter referred to as the "Study Team") assigned by the Japan International Cooperation Agency (JICA) agreed on the following items :

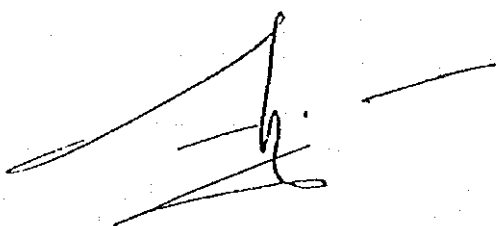
1. The Study Team collected and reviewed reports related to the Study, many of the reports provided by the Counterpart.
2. The Counterpart and the Study Team have worked together to produce an enterprise list for the pre-test enterprise survey.
3. The Study Team in cooperation with the counterpart have planned and executed the pre-test enterprise manpower survey, visited enterprises as listed in item 2, in Java, Sumatera, Kalimantan and Sulawesi.
4. The Study Team in cooperation with the counterpart have planned and executed the existing sources of engineer and technician manpower from Universities, Polytechnics, Vocational Training Centre in Java, Sumatera, Kalimantan and Sulawesi.
5. The Study Team have evaluated and analyzed materials received from the Counterpart, enterprises, and education and training institutions, the result of the analysis will be included in the Interim Report (I) which shall be presented to the counterpart in July 1994.
6. The Study Team is in the process analysing the results of the pre-test survey and prepare a full-scale survey. Based on the results of pre-test survey, the Study Team should improve the survey methodology in preparation for the full-scale survey of approximately over 3,000 enterprises.
7. The Counterpart will make arrangement with The Region Offices for full-scale enterprises surveys in cooperation with the Study Team.
8. The full-scale enterprise surveys should progress with Steering Committee consisted of the members in the National Development Planning Agency (BAPPENAS), Ministry of Manpower (DEPNAKER), Ministry of Education and Culture, Ministry of Industry, Central Bureau of Statistics, The Agency for the Assessment and Application of Technology (BPPT), and any other institution deemed necessary to be included in the Steering Committee. The Study Team will assign the local consultants to do the full-scale survey. The Steering Committee should work together with the local consultants in implementing and evaluating the result of the full-scale survey.

9. The Study Team is on going to develop a plan for the engineer and technician supply and demand models using results of input-output tables and pre-test enterprise surveys.

As representatives of the Counterpart and the Study Team, the following signatories agree to the above :

June, 7, 1994

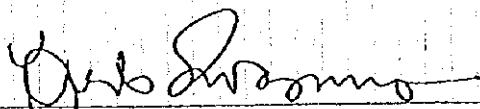
JAKARTA, INDONESIA



MAMAN SETIAWAN
HEAD, BUREAU OF MANPOWER
AND EMPLOYMENT DEVELOPMENT
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)



TAKENO MAYUKI
TEAM LEADER
THE STUDY TEAM



YUDO SWASONO
CHAIRMAN
PLANNING AND DEVELOPMENT BOARD
MINISTRY OF MANPOWER (DEPNAKER)

JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

MINUTES OF MEETINGS
FOR
THE INTERIM REPORT (I)
OF
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY,
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

JULY 29, 1994, JAKARTA, INDONESIA

The Indonesian side consisting of the National Development Planning Agency (BAPPENAS) and the Ministry of Manpower (DEPNAKER) (hereinafter referred to as "the Counterpart") and the Japanese Study Team for the Study of Engineering Manpower Development Planning in the Republic of Indonesia (hereinafter referred to as the "Study Team") sent by the Japan International Cooperation Agency, agreed on the following items mentioned below after a series of discussions.

The lists of attendants at the meetings are attached in Annex I.

1. The Study Team explained the draft Interim Report (I), which is based on the result of Phase I of The Study of Engineering Manpower Development Planning in the Republic of Indonesia.
2. After holding a series of discussions, the Counterpart and the Study Team agreed on the contents of the final version of the Interim Report (I).
3. Based on the above agreement, the Study Team submitted 30 (thirty) copies of the final version of the Interim Report (I).
4. The following points were discussed with the Counterpart and these points will be considered in Phase II of the Study, to the extent that it is deemed appropriate in view of the objectives of the Study.

(1) Engineering Manpower Development Programs of Other Ministries

The Counterpart suggested that it may be necessary to seek data on engineering manpower development programs under the jurisdiction of other ministries, if any.

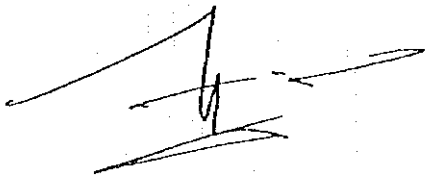
(2) External Efficiency of Manpower Supply

The Counterpart requested that in Phase II, the Study Team investigate supply conditions of engineering manpower with increased focus on its *External Efficiency* (employment efficiency of school graduates in labor market).

As representative of the Counterpart and the Study Team, the following signatories agree on the above :

July 29, 1994

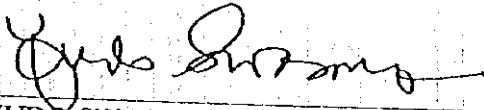
JAKARTA, INDONESIA



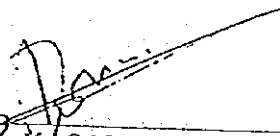
MAMAN SETIAWAN
HEAD, BUREAU OF MANPOWER
& EMPLOYMENT CREATION,
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)



TAKENO MAYUKI
TEAM LEADER
THE STUDY TEAM



YUDO SWASONO
CHAIRMAN
PLANNING & DEVELOPMENT BOARD
MINISTRY OF MANPOWER
(DEPNAKER)



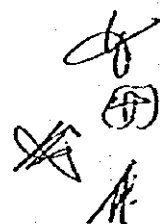
WITNESS: KASAI AKIRA
SPECIAL TECHNICAL ASSISTANT
TO THE PRESIDENT
JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

MINUTES OF MEETINGS
FOR
THE INTERIM REPORT (II)
OF
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT
PLANNING
IN THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY,
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

MARCH 23, 1995
JAKARTA, INDONESIA



The Indonesian side consisting of the National Development Planning Agency (BAPPENAS) and the Ministry of Manpower (DEPNAKER) (hereinafter referred to as "the Counterpart") and the Japanese Study Team for the Study of Engineering Manpower Development Planning in the Republic of Indonesia (hereinafter referred to as "the Study Team" and "the Study" respectively) sent by the Japan International Cooperation Agency (JICA), between March 9, 1995 and March 30, 1995, held a series of discussions, with regard to the Interim Report (II) of the Study.

The salient results of the discussions are as follows.

1. The Study Team explained the draft Interim Report (II), which is based on the result of Phase II of the Study, to the Counterpart, on March 10 and 13, 1995.
2. After questions and expressions of views from the Indonesian side, the contents of the Interim Report (II) met basic agreement from the Counterpart, and based on this agreement, the Study Team submitted to the Counterpart 30 (thirty) copies of the final version of the Interim Report (II).
3. The Counterpart expressed that they found the results the Establishment Manpower Survey of 3,000 establishments very interesting and useful, and that they hoped that further analysis of the survey would be undertaken and become part of the final report.
The Counterpart also expressed their hope that the survey of this nature would be carried out in future by themselves.
4. The Counterpart expressed their desire for receiving technology transfer from the Study Team regarding the methodology of estimating and forecasting the current and future supply and demand volume of engineering manpower, which will be undertaken in the third phase of the Study. The Study Team agreed on this point in principle.

5. The Counterpart stated that the planning part of the Study was a matter of great concern to the Indonesian side, and that they hoped to start discussions with the Study Team on the future directions of proposals on manpower development at an earlier date of the next phase, in order that those proposals would be well coordinated between both sides.

6. The Counterpart confirmed that they would make utmost efforts in obtaining "national establishment census data" which the Central Bureau of Statistics (BPS) is expected to release by the end of March, 1995. The Counterpart will keep communicating with BPS to follow the status of data preparation and will seek the possibility of earlier release of the data.

Both sides confirmed that if such data were not made available to the Study Team by the end of May, 1995, the Study Team would inevitably have to adopt an alternative measure of estimating the current number of establishments in Indonesia, which would affect the accuracy of manpower estimate and forecast.

The Counterpart will notify the Study Team through JICA Indonesia Office the status of data availability at BPS by then.

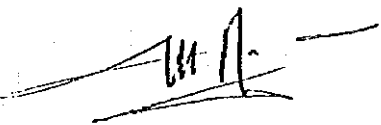
7. The Counterpart expressed their hope that the result of the Study would be utilised as part of the source of information for preparing Repelita VII.

The list of attendants at the meetings is attached as Annex.

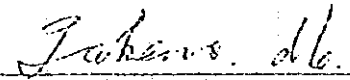
As representative of the Counterpart and the Study Team, the following signatories agree on the above :

March 23, 1995

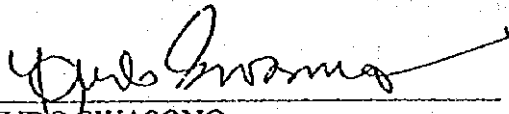
JAKARTA, INDONESIA



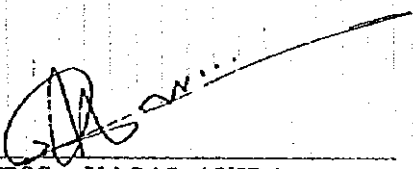
MAMAN SETIAWAN
HEAD, BUREAU OF MANPOWER
& EMPLOYMENT CREATION,
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)



TAKENO MAYUKI
TEAM LEADER
THE STUDY TEAM



YUDO SWASONO
CHAIRMAN
MANPOWER PLANNING & DEVELOPMENT BOARD
MINISTRY OF MANPOWER
(DEPNAKER)



WITNESS : KASAI AKIRA
SPECIAL TECHNICAL ASSISTANT
TO THE PRESIDENT
JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

ANNEX : LIST OF ATTENDANTS

INDONESIAN SIDE

Drs. Maman Setiawan, MA	Head, Bureau of Manpower & Employment Creation National Development Planning Agency (BAPPENAS)
Dr. Yudo Swasono	Chairman, Manpower Planning & Development Board Ministry of Manpower (DEPNAKER)
Dra. Endang Sulistyarningsih, MSc	DEPNAKER
Dr. Diah Widarti	DEPNAKER
Ir. Daulat Sinuraya	DEPNAKER
Drs. Maman Suhermanto	DEPNAKER
Zateman Rajaguguk, SH	DEPNAKER
Drs. Godang Sinaga	DEPNAKER
Dewy Paryanti	DEPNAKER
Dra. Rahma Iryanti	BAPPENAS
Drs. Soewarno	BAPPENAS
Dr. Abdul Malik	BAPPENAS
Drs. Rusman Heriawan	BPS

JAPANESE SIDE

Mr. Kasai Akira	Japan International Cooperation Agency
Mr. Hanatani Atsushi	Japan International Cooperation Agency
Mr. Yoshiara Shumon	Japan International Cooperation Agency, Indonesia Office

THE STUDY TEAM

Mr. Takeno Mayuki	Team Leader / Human Resource Development
Mr. Endo Aichiro	Sub Leader / Technical Education & Training Development
Mr. Saito Shusei	Macro Economy
Mr. Yanagisawa Mitsuyasu	Manpower Supply & Demand

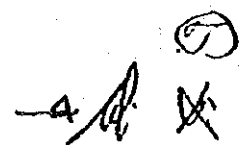


JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

MINUTES OF MEETINGS
FOR
THE INTERIM REPORT (III)
OF
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY,
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA

SEPTEMBER 28, 1995, JAKARTA, INDONESIA

Handwritten signatures and initials in the bottom right corner, including a circled '5' and a signature that appears to be 'A. D.' followed by a large 'X'.

The Indonesian side consisting of the National Development Planning Agency (BAPPENAS) and the Ministry of Manpower (DEPNAKER) (hereinafter referred to as "the Counterpart") and the Japanese Study Team for the Study of Engineering Manpower Development Planning in the Republic of Indonesia (hereinafter referred to as the "Study Team") sent by the Japan International Cooperation Agency, agreed on the following items mentioned below after a series of discussions.

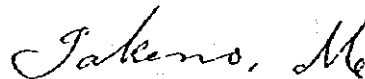
1. The Study Team explained an outline of the Draft Final Report to the Counterpart following ANNEXURE I .
2. Following statements in ANNEXURE II as agreed on with the Counterpart, the Study Team will prepare the Interim Report (III) preceding the Draft Final Report and submit 30 (thirty) copies of them in the middle of October 1995.
3. The Study Team developed Engineering Manpower supply and demand forecast model, and implemented technical transfer to the Counterpart by using manual in explanation of the model.
4. Thirty copies of the Draft Final Report based on the Interim Report (III) will be submitted in December 1995 which added analysis on -the-spot investigation in phase III.

As representative of the Counterpart and the Study Team, the following signatories agree on the above :

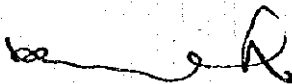
SEPTEMBER 28, 1995
JAKARTA, INDONESIA



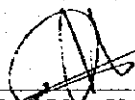
MAMAN SETIAWAN
HEAD, BUREAU OF MANPOWER
& EMPLOYMENT CREATION,
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)



TAKENO MAYUKI
TEAM LEADER
THE STUDY TEAM



SLAMET TJOKROPRANOTO
FOR
YUDO SWASONO
CHAIRMAN
PLANNING & DEVELOPMENT BOARD
MINISTRY OF MANPOWER
(DEPNAKER)



WITNESS: KASAI AKIRA
SPECIAL TECHNICAL ASSISTANT
TO THE PRESIDENT
JAPAN INTERNATIONAL
COOPERATION AGENCY (JICA)

OUTLINE OF DRAFT FINAL REPORT PROPOSED BY THE STUDY TEAM**1: ECONOMIC GROWTH SCENARIOS AND SOCIAL FRAMEWORK**

First, to create a framework for analyzing engineering manpower development in Indonesia, the Study creates a scenario of future Indonesian macroeconomic growth. The Study Team's scenario closely follows the PJP-II GDP growth plan, but increases employment forecasts by 25% more than PJP-II in 2018/19, as this seems reasonable in accordance with the PJP-II GDP growth forecast.

According to this scenario, Indonesia's economy will move into the "take-off" stage, reducing economic "dualism". Engineers, technicians, and skilled workers must work together to found and foster industry in Indonesia. Indonesia's present education and training system, however, seems to have constraints hindering engineering manpower development: weak connection between industry and education, too strong favoritism for university graduates, scarce in-house training, less practical engineering abilities of university graduates, insufficient education qualities, etc. This Study will undertake planning to resolve these problems.

2: ENGINEERING MANPOWER SUPPLY AND DEMAND

This Study performed a national survey of 3,000 establishments in all sectors. Results of this establishment survey supported findings described above: manufacturing is not always the prime destination of engineering manpower, university graduate engineers are paid high salaries regardless of the sector or establishment size, few technicians graduate from polytechnics, etc.

The Study's prototype model forecasts engineering manpower demand for the next 25 years. The Study also estimates engineering manpower stock, and compared stock forecasts with demand over the next 25 years. Results foresees several mismatches between supply and demand in terms of occupation – educational career and industry – technical specialization.

Based on these findings, 5 issues were selected as fields where countermeasures shall be planned to insure sound Indonesian industrial growth:

- 1) Severe shortage of polytechnic graduates as technicians.
- 2) Excess of university graduates as engineers.
- 3) Shortage of high school graduates as skilled workers.
- 4) Low demand for engineering manpower in manufacturing industries.
- 5) Shortage of construction engineers.

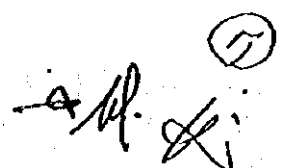
③
a.p. K.

3: STRATEGY TO DEVELOP ENGINEERING MANPOWER RESOURCES

So called "formalism" seems to dominate many of issues suggested above. In present days when Indonesia's industry technology just started up, concept to assign university graduate as engineers, polytechnic graduates as technicians, and high school graduates as skilled workers may lead to hierarchy which does not correspond to actual values created by each manpower. Technicians and skilled workers are looked upon to be short to demand in future and this shortages will constrain sound growth of Indonesia in future, when one embraces this hierarchy.

If we call the above inflexible hierarchy "formalism", the Study Team proposes to emphasize "pragmatism". "Pragmatism" will define jobs of engineers, technicians, and skilled workers from the viewpoint of economic productivity and suggest to develop them as manpower resources on the basis of their qualifications, knowledge, and experience, not based only on past education. "Pragmatism" creates an enterprise where engineers, technicians, and skilled workers work together to complete jobs, not in relationship between the superior and the inferior.

Another important point for improving manpower development is "networking". "Networking" is the cooperation between industry, education institutions, and government, and inside each of these three. Networking helps develop manpower most needed by industry. This Study will undertake planning which emphasis both "pragmatism" and "networking".



**DISCUSSIONS DONE ON OUTLINE OF DRAFT FINAL REPORT
PROPOSED BY THE STUDY TEAM**

1: ECONOMIC GROWTH SCENARIOS AND SOCIAL FRAMEWORK

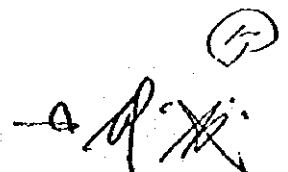
- 1-1 Macroeconomic scenario constituting a framework of the Study shall follow new GDP growth plan during REPELITA-VI announced in the Presidential speech on August 17, 1995.
- 1-2 Volume of employment through the period of PJP-II can be rationalized by the Study team.
- 1-3 Figures representing these macroeconomic assumptions shall be illustrated consistently.

2: ENGINEERING MANPOWER SUPPLY AND DEMAND

- 2-1 The definition of engineering manpower – engineer, technician, and skilled worker – shall be stated clearly and simply at first.
- 2-2 Utilizing figures about the population group, the Study Team shall estimate present distributions of engineering manpower based on the establishment survey in 1994.
- 2-3 Following four issues shall be considered as fields where countermeasures shall be planned to insure sound growth of Indonesia, provided that forecast demand for engineering manpower shall disaggregate into each industries and occupations:
 - 1) Severe shortage of polytechnic graduates as technicians.
 - 2) Excess of university graduates as engineers.
 - 3) Need to foster skilled workers to help resolve lack of technicians and excess of engineers in the context of above 1) and 2)
 - 4) Manufacturing has low demand for engineering manpower.

3: STRATEGY TO DEVELOP ENGINEERING MANPOWER RESOURCES

- 3-1 "Formalism" shall imply the situation where manpower is evaluated based only on past education in the engineering and technological fields of production.

Handwritten signature and initials in the bottom right corner of the page.

ANNEXURE-II

- 3-2 Concept of "globalization" and "hollow middle" shall be incorporated in analysis of measures to develop engineering manpower resources.
- 3-3 Following five measures shall be rationalized to enhance industrialization by means of developing Engineering Manpower in cooperation among government, demand-side and supply-side:
- 1) Network system to improve labor market efficiency.
 - 2) Restructuring BLK.
 - 3) New occupation model for engineering manpower.
 - 4) Enhancement of inhouse-training.
 - 5) New education system for engineering manpower.
- 3-4 Network system to improve labor market efficiency shall include not only information system which connects Local Area Networks at DEPNAKER, Bureau Pusat Statistik and BAPPENAS, but also overall administrative system to maintain its effectiveness.
- 3-5 Restructuring BLK shall incorporate consideration of its proper position in new educational system, appropriate partnership/cooperative training with private sectors, and proper operation according to regional requirement.
- 3-6 New occupation model for engineering manpower shall illustrate relation between occupations and school systems desirable for Indonesia, showing comparison with models in Japan etc.
- 3-7 Enhancement of inhouse-training in private sectors shall be proposed as a consistent policy to meet realistic requirement of private sectors.
- 3-8 New education system for engineering manpower shall be considered in view of developing manpower resources useful in private sectors and public sectors as well to support industrialization.

JAPAN INTERNATIONAL COOPERATION AGENCY
IN COOPERATION WITH
NATIONAL DEVELOPMENT PLANNING AGENCY (BAPPENAS)
MINISTRY OF MANPOWER (DEPNAKER)
REPUBLIC OF INDONESIA

**MINUTES OF MEETINGS
FOR
THE DISCUSSION OF DRAFT FINAL REPORT
OF
THE STUDY OF ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA**

**AGREED UPON BETWEEN
NATIONAL DEVELOPMENT PLANNING AGENCY,
MINISTRY OF MANPOWER
AND
THE STUDY TEAM FOR
ENGINEERING MANPOWER DEVELOPMENT PLANNING
IN THE REPUBLIC OF INDONESIA**

FEBRUARY 7, 1996, JAKARTA, INDONESIA

(17)
A. S.
S.

In accordance with the Minutes of Meetings agreed upon between National Development Planning Agency (BAPPENAS), Ministry of Manpower (DEPNAKER) – both of the agencies hereinafter collectively referred to as "the Counterpart" – , and the Study Team for Engineering Manpower Development Planning in the Republic of Indonesia – hereinafter referred to as "the Study Team" – , under the witness of Japan International Cooperation Agency (JICA), on September 28, 1995, the JICA Study Team submitted, on 30th day of January 1996, thirty (30) copies of the Draft Final Report to the Counterpart and had a series of meetings as shown below:

- | | |
|--------------------------|---|
| January 30 and 31, 1996: | Discussion with DEPNAKER
(Ms. Endang Sulistyaningsih) |
| January 31, 1996 (Wed): | Discussion at Ministry of Education and Culture
(Mr. Bambang Soehendro; with participation of Ms. Endang Sulistyaningsih – DEPNAKER) |
| February 2, 1996 (Fri): | Discussion with BAPPENAS
(Drs. Maman Setiawan)
Discussion at Ministry of Education and Culture
(Dr. Sri Hardjoko Wirjomartono) |
| February 3, 1996 (Sat): | Discussion with DEPNAKER
(Dr. Yudo Swasono) |

where following points were discussed and confirmed:

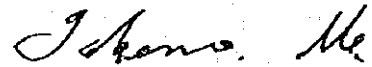
1. The Draft Final Report was accepted in principle by the Counterpart.
2. The Counterpart agreed to prepare their official comments on the Draft Final Report by February 22, 1996. DEPNAKER will be in charge of collecting and integrating comments from agencies concerned and will submit them to JICA Indonesia office.
3. Referring to the comments prepared by the Counterpart, the JICA Study Team shall complete the Final Report by March 22, 1996. The JICA Study Team shall send fifty (50) copies of the Final Report to DEPNAKER who will distribute them to the concerned agencies.
4. The Counterpart agreed to make the Final Report of the Study open to public in Indonesia and Japan.

As representative of the Counterpart and the Study Team, the following signatories agree on the above:

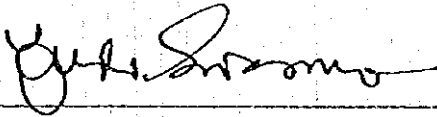
7th day of February 1996
Jakarta, INDONESIA



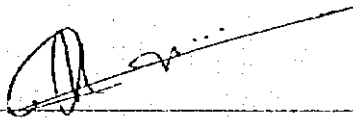
MAMAN SETIAWAN
Head, Bureau of Manpower
& Employment Creation,
NATIONAL DEVELOPMENT
PLANNING AGENCY (BAPPENAS)




TAKENO MAYUKI
Team Leader
THE STUDY TEAM



YUDO SWASONO
Chairman,
Planning & Development Board,
MINISTRY OF MANPOWER (DEPNAKER)



WITNESS: KASAI AKIRA
Special Technical Assistant to the President,
JAPAN INTERNATIONAL COOPERATION
AGENCY (JICA)





GLOSSARY**CAPITAL/LABOR RATIO**

This ratio shows the relative amounts of capital and labor, the two factors of production, that are used in the production process. If the ratio of capital used is higher than that of labor, the industry is called capital intensive.

CLASS AND LEVEL

Employees' occupations are categorized in "classes" - engineers, technicians, skilled workers, management and clerks etc.- whereas educational careers of labour forces are categorized in "levels" - university graduates, academy graduates, high school graduates etc. The Study Team would like to distinguish these categories explicitly in order to analyze the gap between them.

COMPARATIVE ADVANTAGE

An advantage in terms of comparative production costs. Division of labor is based on the concept of comparative advantage, and internationally as well, the promotion of free trade allows the principle of comparative advantage to work, resulting in international division of labor.

DUAL ECONOMY

An economic condition in which a low productivity agricultural sector coexists in a given country with an industrial sector undergoing belated modernization.

EMPLOYMENT COEFFICIENT

Numbers of employees for production of a unit of a sector or commodity is the employment coefficient. In case 100 persons work to produce Rp. 1,000 of rice, the employment coefficient of rice is 0.1.

Employment coefficients can be divided up and calculated for each occupation.

ENDOGENOUS VARIABLES

Within an econometric model, these variables are generated through internal calculation after the parameters have been set. Econometric models are constructed for the purpose of generating endogenous variables.

ENGINEERING MANPOWER

Engineering manpower in the report includes engineers, technicians, and skilled workers.

ESTABLISHMENT MANPOWER SURVEY

The actual survey of over 3,000 enterprises carried out by the Study team from September to December, 1994.

EXOGENOUS VARIABLES

Within an econometric model for which parameters are given, these variables are not generated through internal calculations, but are artificially introduced from outside of the model. Exogenous variables are used to establish the assumed conditions from which endogenous variables will be generated.

EXTERNAL EFFICIENCY

In general, external efficiency in year 19XX =

$(\text{number of 19XX graduates finding jobs}) \div (\text{number of graduates in 19XX}) \times 100$

If all graduates in a year find employment in the year of graduation, the External efficiency is 100%.

Each country has its own education system and culture, so this figure is not always appropriate for international comparison. For international comparison, a "wider measure" of External efficiency is shown below. International comparisons will analyze both this "Wide External Efficiency" and standard External efficiency. In this Study, Wide External Efficiency is used.

Wide External Efficiency = $(\text{number of graduates finding jobs over the past Y years}) \div (\text{number of graduates over the past Y years}) \times 100$

FORMALISM

In EM recruitment, employment, and development, the practice of regarding--in a formal manner--to look upon university graduates majoring science and engineering as engineers, polytechnic school graduates as technicians, and technical high school (general and technical) graduates as skilled workers. This term also implies a social system in which, regardless of what jobs they are doing, the engineer is treated better than the technician and the technician

is treated better than the skilled worker, as if that order represents class of 'Integrity'.

FREE TRADE ZONES (FTZ)

In an attempt to stimulate industrial development in developing economies, FTZ were advocated by the United Nations Industrial Development Organization (UNIDO), which was launched in 1967. In Malaysia, for instance, the government, in an effort to entice industry to boost exports, in the 1970s began offering a variety of export incentives to companies with operations within these FTZ.

FULL-SET TYPE OF INDUSTRIALIZATION

Every kind of product, from heavy to light, from large to small, from sophisticated to rough, is manufactured in country. Japan is one of representative countries for this type of industrialization

Hollow-Middle

Hollow-Middle means fragile and weak small-medium sized company groups in industrial structure of Indonesia that exist in between state-owned or foreign capital large sized companies and a huge number of traditional household industries.

HORIZONTAL MISMATCH

A situation where an employee's occupational classification does not conform with his/her engineering specialization. For instance, a graduate in nuclear physics employed as a computer programmer at a financial institution.

INHOUSE TRAINING

Several types of actual training that are conducted for employees, whether compulsory or optional. In a narrow sense of the word, it means only lessons at a classroom. Meanwhile, in a wide sense of the word, it includes not only classroom lectures, but also any field work or site work at local factories, overseas plants etc.

INPUT COEFFICIENT

Coefficients of input of a sector or commodity for production of a unit of a sector or commodity. In case Rp.100 of fertilizer is necessary for producing Rp.1,000 rice, the input coefficient of fertilizer for rice is 0.1. A table of input coefficients (input sectors or commodities in rows and output or production sectors in columns) is an Input coefficient matrix.

INTERNAL EFFICIENCY (INDEX-1 AS I.E.(1), AND INDEX-2 AS I.E.(2))

$$\text{I.E.(1):} \quad \frac{\text{(number of graduates)}}{\text{(total number of students enrolled)}} \times 100 (\%)$$

$$\text{I.E.(2):} \quad \frac{\text{(number of graduates)}}{\text{(number of freshmen)}} \times 100 (\%)$$

In the case of 4-year undergraduate schools, 25% is the highest figure for Index-1 in the related countries, while 100% is the highest figure for Index-2. Internal efficiency in Indonesia is relatively low. Most students in Related Countries graduate from university in 4 years, but the average in Indonesia takes 6 years.

INVERSE MATRIX

With square matrices A , A^{-1} , I (I is a matrix all of which diagonal factors are 1 with 0 at the rest), if $A \cdot A^{-1} = A^{-1} \cdot A = I$, A^{-1} is inverse matrix of A .

If determinant of A ($|A|$, $a_{11} \cdot a_{22} - a_{12} \cdot a_{21}$ in case A is 2 dimensional matrix) is not 0, A has inverse matrix. A standard input coefficient matrix (square matrix with factors greater than or equal to 0 and less than or equal to 1 and not all factors are 0 or 1) must have inverse matrix.

LEAKAGE TO IMPORTS

This is a phenomenon where an increase in imports occurs simultaneously with an increase in domestic production through import substitution, and it happens because the links among different industries are underdeveloped. For example, the case where increased domestic production of automobiles through import substitution creates a simultaneous increase in imports of machine parts, dies and molds, etc.

MANPOWER DEVELOPMENT FUNDS

Subsidiary payments system established for the purpose of fostering engineering manpower, which is carried out by enterprises that seek improvement of engineering and technology.

NETWORKING

A concept brought forward to disseminate "pragmatism" in Indonesia. Networking is intended to enhance the intercourse of information, personnel, and money within and between industry, educational institutions, and the government which are responsible for the development of EM. For example, a university which obtains company information to help its graduates find jobs is promoting educational-industrial networking.

OVERQUALIFIED EMPLOYMENT

An employment condition in which workers with advanced academic careers must accept positions equivalent to lower academic careers.

PERIPHERY (SUPPORTING) INDUSTRIES

The industries which support, from bottom up, the machinery industry and other heavy industrial sectors. Typical examples include casting and forging, galvanizing, machine parts, molds and dies, cutters and presses, precision/multichrome molded plastics, surface treatment technology, and so on.

PRACTICAL PARADIGM

The practice of defining jobs of engineers, technicians, and skilled workers, respectively, from the viewpoint of economic productivity and employing and developing them as manpower resources on the basis of their qualifications, knowledge, and experience, rather than their academic careers. This term implies a social system in which the relationship between the engineer, technician, and skilled worker represents the distribution of jobs, not the relationship between superiors and inferiors.

PROTOTYPE

A system to be developed as a preliminary one which adopts only basic functions expected for complete system. It is common in system development

to develop a prototype at first, evaluate it, and start to develop the final model taking into account issues considered on prototype model. This process is more promising and efficient than developing the final model from the first.

RAS

A method to estimate future input coefficients. It divides transformation of input coefficient matrix from base year to year in comparison into R and S vectors (R for Replacement over sectors and S for Substitution among commodities) and forecasts future input coefficient matrix in multiplying base year input coefficient matrix (A) by these vectors in the power of duration of forecasting period.

SKILLED SAINT SYSTEM

The skill saint scheme is an incentive measure to urge workers to acquire skill in Korean society, which attaches importance to academic career.

SMALL GROUP ACTIVITIES

This system encourages proposals regarding labor saving improvements, rationalization, quality control and workshop environment in the division or section units in each field of production. The system plays a large role in reducing costs enhancing productivity and boosting employee morale. Furthermore, efforts are made to carry out proposals by giving incentives such as monetary rewards and overseas inspection trips to employees who make many good proposals in a year.

SUPPORTING INDUSTRY

Many types of smaller-size industries which comprise indispensable portion of the main industries in a country, whether they are producer goods, or consumer goods.

TURNING POINT

The economic development of a given country is the process where an agricultural sector burdened with excess labor supply and low productivity is dominant, but a highly-productive industrial sector which undergoes progressive reproduction is created, and the latter absorbs the former's excess manpower and gradually increases its share of the overall economy. The turning

point is defined as the point at which the supply of laborers flooding into the cities from farming villages (due to economic development) is exhausted, and laborer wages begin to rise. Once this turning point is reached, the next phase of economic development begins, in which the industrial structure becomes more sophisticated and the agricultural sector becomes modernized.

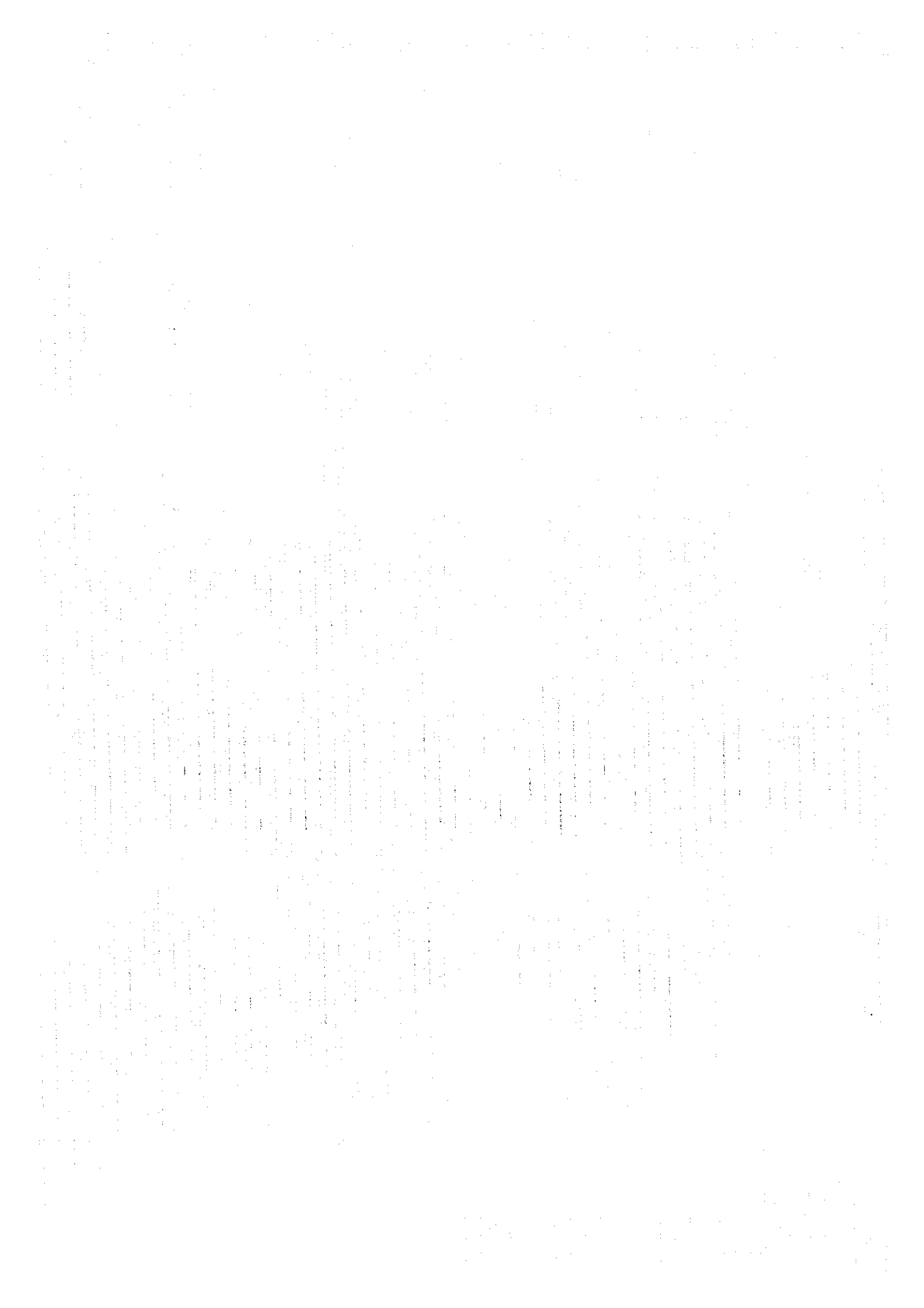
VERTICAL MISMATCH

An employment condition in which workers with advanced academic careers must accept positions equivalent to lower academic careers. Identical to Overqualified Employment.

Appendix 3

DEFINITION OF ENGINEERING MANPOWER

	ISCO DEFINITION	THE STUDY'S DEFINITION
ENGINEER	Professionals who increase the existing stock of knowledge by applying scientific concepts or theories. Ability to research, advise, design, and supervise operations in their field of expertise. University degree required.	Similar to ISCO. The Study also includes graduates of University
Technician	Workers who mostly perform technical and related tasks connected with research and the application of scientific concepts and operational methods. Most technicians have non-university education or training for about 4 years from the age of 17 or 18.	Similar to ISCO. The Study also includes graduates of a polytechnic with a D1, D2, or D3 degree.
Skilled Worker	ISCO defines "plant & machine operators & assemblers" as occupations which require ability to operate large scale, often highly automated, machinery & equipment. Usually requires education or training until the age of 18 (or the equivalent in education plus on-the-job training).	Similar to ISCO. The Study also includes operators of computers and other types of equipment requiring specialized skills (laboratory equipment, agricultural machinery, etc.). The Study also defines skilled workers as machinery or equipment operators with education until age 15 plus 10 years operating experience.



Appendix 4

LIST OF ENTERPRISES AND INSTITUTIONS VISITED AND INTERVIEWEES

INDONESIA

<Educational Institutes>

Intitut Teknologi Bandung (ITB), *Iman Soengkowo. Ph. D., Vice Rector for Academic Affairs*

Politeknik Manufactur Bandung, *Kokok Haksono, HTL, Theory Section Head*

Politeknik ITB, *Ir. Tommy Soewandito, Director*

Universitas Jenderal Achmad, YANI (UNJANI), *Ir. A. Latief BCTT, Head, Department of Technology*

Vocational Training Center in Surabaya, *Siti Djaminar. SH.*

Universitas Brawijaya Politeknik, *Ir. Indradi Adiwidjana, Assistant Direktur*

Vocational Training Center in Singosari, *Dra. Siti Mutmainah*

Institut Teknologi Sepuluh Nopember (ITS), *Ir. Soegiono, Vice Rector*

Politeknik Elektronika Surabaya (EEPIS), *Susanto, Director*

Politeknik Perkapalan ITS, *Ir. Soegiono, Director*

Vocational Training Centre in Palembang, *Drs. Kasman Barus, Head*

Universitas Sriwijaya, *Amran Halim, Rector*

Politeknik Universitas Sriwijaya, *Ir. Marlisnar, Director*

Vocational Training Centre In Medan, *Hirota KAWAHARA, Expert*

Universitas Sumatera Utara Politeknik, *Pintoro Wirjodihardjo, Director*

Universitas Hasanuddin Politeknik, *Ir. A. Mauraga Machmud, MS, Director*

Vocational Training Centre in Ujung Pandang, *Ir. Hasan Muchlys, Head*

Politeknik Universitas Sam Ratulangi, *Dr. Ir. Ruddy Tenda, Director*

Institut Teknologi Minaesa, *Ir. Herdianto Lantemona*

Vocational Training Centre in Bitung, *Ir. I. Wayan Suarna, Head*

Universitas Sam Ratulangi, *R.S. Tangkudung, Rector*

Universitas Mulawarman, *Prof. Dr. Ir. Riyanto Msc, Vice Rector*

Politeknik Pertanian Samarinda, *Dr. Ir. Muchlis Rachmat. M. Agr., Director*

Politeknik Samarinda, *Arifin Kalibe & Drs. H. Mahmud Z.*

Vocational Training Centre in Samarinda, *Abidin*

<Government Organization>

Ministry of Industry, Bureau of Planning, *Mr. Hendy H. Mustafa & Mr. Soenaryo Danusaputro, Director*

BKPM, *Dr. Asril Noer, Director of Overseas Promotion*

<Enterprises and others>

PT. JAYA KONSTRUKSI, *Ir. Johan Gito, Vice Director*

PT. Indomobil Suzuki, *Mr. Ozawa, Managing Director*

PT. Toyota-Astra Motor, *Ir. Eddie Paino, Ass. General Manager,
Ir. Suhardi Lukman, Ass. General Manager, Engineering Div. & Mr. Aditia S.P.,
Ass. Manager, Human Resources Div.*

PT. LIPPO MELCO Manufacturing, *Mr. Takashi Nagasawa, Vice President*

PT. Naga Tara, *Mr. Hendro Hartowan, Director*

PT. REKAYA Industry, *Mr. Hardis, General Engineering Manager*

Jakarta Industrial Estate, *Drs. Fatahillah Dachlan & Ir. Saie Khuswa, Marketing &
Development Director*

PT. PUPUK SRIWIDJAJA (Palembang), *Ir. Nanang S. SUTADJI, Technical Director,
& others*

PT. Multi Mineral (Medan), *Drs. M. Ayut, Manager & Mr. Marmsimin, President
Director*

PT. Atmindo, *Mr. Soetrisnmo, Company Secretary & Mr. Sujiman, Engineering Dept.*

PT. Indo-Yama, *Mr. Hengky Wiyaya, Director & others*

PT. Barata, *Drs. Bambang Ocuk, Administration Manager*

PT. Pupuk Driwidjaja, *Ir. Nanang S. SUTADJI, Technical Director, Ir. Nanang S.
Sjutady, Technical Director, & others*

PERTAMINA (Palembang), *Mr. Hassmil Hasan, Head of Engineering Div., & others*
State-owned Industrial Estate PT. KIMA (Ujung Pandang), *Mr. Sjariful Anam,
President Director*

PT. South Sucol, *Mr. Christian Tansil, Director, & others*

PT. SNTC Indonesia, *Mr. H. Matsumoto, Director Utama, & others*

PT. Tifinindo Raya, *Mr. Rackaman, Manager*

FPT. Sekisin Farina Wood Indonesia, *Mr. Mohamad Rjulin Rushi, Vice President, &
others*

PT. Makassar Plastiind, *Mr. Frans Heming, President Director*

PT. Polwood Ijorest Industri, *Drs. Salewang Syamsualang, President Director*

PT. Boma-Bismia-Indra (BBI) (Surabaya), *Ir. Widodo, Director Pemasaran, & others*

PT. Industri Kereta Api (INKA), *Mr. Sjarwani, Financial Director, & others*

BBI, *Ir. Widodo, Directur Pemasaran, & others*

Sjurabaya Industrial Estate, *Drs. Ec. Sugiati, President Director, & others*

PT. Pabrik Kapal Indonesia (PAL), *Mr. Awzai, Director General, & others*

PT. Philips'-Ralin Electronics, *Mr. Kaszief Kaslan, Deputy Plant Manager, & others*

PT. Panggurig Electtonics Industries, *Mr. Harry Gunawan, General Manager, & others*

PT. Utomodeck Metal Works, *Mr. Edu Wakyama, Human Resources Manager, & others*

PT. Indonesia Multi Color Printing, *Mr. Awang Aduani, Personnel Manager*

PT. Kertas Leces, *Mr. I. Made Dastry, Director, & others*

PT. Petrokimia Gresik, *Mr. Aroe Biono Soenarjo, Production Director, & others*

PT. Industri Pesawat Terbang Nusantara (IPTN) (Bangdon), *Mr. Janurso, Deputy Director of Production, & others*

Directorate of Mineral Resources (Bangdon), *Dr. Akiyama, Senior Advisor*

PERTAMINA (Jakarta), *Mr. Sisiwanto Hoerip, Planning & Development Manager, & others*

PT. Krakatau Steel (KS), *Mr. K. Murdiyanto, General Manager-Personnel, & others*

Badan Tenaga Atom Nasional (BATAN), *Mr. Soekarno Suyudi, Director, Bureau of Public Cooperation, and others*

PT. Tambang Timah, *Mr. Armeya Yakya, Manager, and others*

Bogor Agricultural University, *Dr. Abdul Aziz Darwis, Director*

Inter University Center for Biotechnology, *Dr. A. Naito, Expert of JICA*

Software Association of Indonesia (ASPILUKI), *Ir. Kusmartono, Executive Director, & others*

PAN SYSTEM, *In Bangang Gunadi, Director*

MALAYSIA

<Educational Institutes>

Ministry of Education, *Dr. Abdul Halim Ahmad, Principal Assistant Director, Educational Planning and Research Division*

Ministry of Education, *Mr. Lin Bin Husin, Assistant Director, Vocational Education*
Kota Baharu Polytechnic, *Mr. Tahir Ahmad, Head, Training and Visit Unit/Lecturer, Civil Eng. Dept.*

University Malaya, *Dato'Ahmad Nawawi, Deputy Vice Chancellor*

Vocational Secondary School Sungai Buloh, *En Baharom Bin Endut, Principal of School*

Technical Institute, Cheras, *Awi Bin Ab Jalil, Head of Department of Technology*

International Islamic University, Malaysia, *Mr. Fadlulla Wilmot, Special Assistant to the Rector*

Ministry of Education, *Mr. Peng Leong, Assistant Director, Technical & Vocational*
Ungku Omar Polytechnic, *Mr. Mohammed Zakaria B. Mond. Noor, Head of Department, Department of Electrical Engineering*

Universiti Sains Malaysia, *Mr. Norpisah Mat Isa, Assistant Resistrar*

Institut Teknologi Mara, *Mr. Asiah Abdullah, Deputy Dean*
Ministry of Human Resources, *Dr. Hj. Shafie bin Hj. Mohd. Salieh*
Tunku Abdul Rahman College, *Mr. Chee Ah Kiow, Registrar*
The Centre for Instructor and Advanced Skill Training (CIAST), *Mr. Ghazian Bin Ghazal, Director*

German-Malaysian Institute (GMI), *Mr. J. Wenzel, Managing Director*
Mara Vocational Training Centre, *Mr. J. Wenzel, Managing Director*
Ministry of Human Resources, *Mr. Zabidin B Abo Samad, Head of Training, Head of Training Management Unit*
Polytechnic Staff Training Centre, *Dr. Zainal abidin Ahmad, Director*

<Enterprises and others>

Daiwa Securities Adviser SDN. BHD, *Yoho Kanemaru, Managing Director*
Daiwa Singapore Ltd., *Kazuyoshi Mizukoshi, Vice President*
Universiti Pertanian Malaysia, *Che Roos Bin Saad, PHD, Lecturer Nutrition & Aquaculture, Sharr Azni Harmin, PHD., Deputy Dean, Endocrinology/Agriculture, Prof. Dr. Mohaned Mahyuddin Dahan, Dean, Faculty of Food Science and Biotechnology, Hassan B. Hj. Mohd Daud, PHD, Fish & Shellfish Diseases (Virology), Fatimah Md. Yusof, PHD, Associate Prof., Limnology*
Daiwa Institute of Research (Singapore) PTE Ltd., *Kenji Nagai, Senior Analyst*
Ministry of Primary Industries, *Muhammad B. Nong PHD, Under Secretary & Mohd. Yusoff B. Mydin, Principal Asst. Secretary*
Malaysian Industrial Development Authority (MIDA), *Sabariah Ahmad, Asst. Director, Industrial Promotion Division*
Perusahaan Otomobil Nasional Berhad, *Masaaki Namba, Advisor, Production Office, Proton & Satoshi Tsurita, Deputy Manager, Corporate Planning Dept.*
Aluminium Company of Malaysia Berhad, *Koji Kawakami, General Manager, Cum Director of Operations & T. Nakajima, Chief Financial Officer*
Hume Industries Berhad (A Hong Leong Group Malaysia Affiliate), *Lor Chee Keong, General Manager, Hume Concrete Division, Chua Yong Wah, General Manager, BE (Hons), MBA, P. Eng., Fiem & Mah Teck Oon, B.E. (Hons), MIEM, P. Eng., Senior General Manager, Concrete Products Division*
Malayawata Steel Berhad, *Choo Kean Hin, Executive Director & Boon Teik Soon, Assist. Superintendent, Rolling Mill Section*
Malaysia Industrial Development Authority, *Manmohan Singh, Director, MIDA Penang*
Hume Industries (Malaysia) Berhad, *Ho King Lin, B. Sc (Civil Eng.), Factory Manager,*

*Teoh Yang Khoon, Personnel Executive Concrete Division & Cho Yew Kay,
General Manager (North), Hume Concrete Division*

JETRO, Kuala Lumpur, George Ikeshita, Director

Persatuan Industri Komputer Malaysia, Alan Fung, Executive Director

*National Vocational Training Council, Ministry of Human Resources, Malaysia,
Nobuhiro Uehara*

Diversified Resources Berhad, Bhaskaran Pillai, General Manager

*Ministry of Human Resources, Planning & Policy Research Div., Dr. Hj. Shafie bin Hj.
Mohd. Salleh, Under Secretary*

*Ministry of Science, Technology & the Environment, Dr. Hamzah Kassim, Director,
Science & Technology Division*

*UMW Corporation SDN. BHD., Mah Song Huat, Research & Planning Executive
Corporate Projects, Research & Planning & Chua Chin Pen, Asst. Manager,
Research & Planning*

*Oriental Assemblers SDN, BHD, (A Subsidiary of Oriental Holding Bhd.), Yukinobu
Kawagoe, Technical Advisor/Director & Eknichi Yoshida, Manager, Engine
Manufacturing/Local Content Div.*

*Commercial Minerals (Malaysia) SDN. BHD., (A member of the Normandy Poseidon
Group, Australia), Kevin Kirvan, Regional Operations Manager*

Paper Automation SDN. BHD., Ja'apar Bin Samat, General Manager

*Daiwa Institute of Research (Singapore) PTE. LTD., Nozomu Kaneko, Managing
Director*

*Pacific Activated-Carbon SDN. Berhad, Toshihiko Harayuma, Managing Director &
Akiyoshi Hirano, Factory Manager*

KOREA

<Educational Institutes>

*Ministry of Education, Kim, Wha-Jin, Assistant Director & Kim Geungho, Director,
Science & Technology Division*

Ministry of Labor, Kim, Sung-Joong, Director, Ability Development Division

Economic Planning Board, Soh, H-Seob, Director, Overall Coordination Division

*Seoul National University, In, Chong-Duck, Assistant Director, Planning &
Coordination*

College of Engineering, Korea University, Young H. Paik, Dean

*Korea Manpower Agency, Ministry of Labor, Yi Jung-Woo, Director, International
Cooperation Division*

Inchon Industrial Master's College, Korea Manpower Agency, Lee, Sang-Joe, Dean

Pusan National University, *Jung, Dong-Hyeon, Dean for Planning & Research*
Dong Yang Institute of Technology, *Chung, Wan-Sup, Chief of Academic Affairs*
Yonsei University, *Kim, Woo Sik, Dean, College of Engineering*
Hansung Science High School, *Hak Soon Hong, Principal*
Induk Junior College, *Mr. Kim, Professor, Mechanical Department*
Hankuk Aviation University, *Hyung Jae Lee, President*
Kyonggi Mee-Tec. High School, *Ok Ryong Chang, Principal*
National Statistical Office, *Bureau of Statistics*

<Enterprises and others>

Embassy of Japan, *Toshitaka Kawamura, Minister, Takaya Abe, First Secretary & Hajime Shiraishi, Labour Attache*

Ministry of Trade, Industry and Energy (Motie) Republic of Korea, *Lee In Ho, Deputy Director, Asian Division 1, International Trade Promotion Bureau*

Ministry of Science & Technology, *Se-Jun Yoon, Director, Manpower Development Division*

JETRO, Seoul, *Tetsuo Murooka, Director, Research*

Gold Star Co., Ltd., *Won Jung Chae, Manager, Goldstar Education & Training Center & Young Su Kim, Public Relations Team*

The Bank of Korea, *Kwak, Jae-Sun, Chief, Interindustry Economics Division, Statistics Dept.*

Daewoo Heavy Industries Ltd., *Won Yong Jai, Manager, Protocol Office*

Sunkyong Limited., *Jong-Youl Lee, General Manager, Information Systems Management Office, & J.H. Kang, Manager, Public Relations Team*

Honam Petrochemical Corp., *Reizo Tsukahara, Representative Vice President, Kim Jong Pyo, Asst. Manager, Corporate Planning Division & Bo Young, Park, Plant Coordination Dept., Planning Div.*

Lucky Metals Corp., *Cho Hyun Joon, General Manager, Personnel Team & Lee, Yong Soon, Manager, Personnel Team*

Pohang Iron & Steel Co., *Woo Ho Jae, Public Relations Sect.*

Hyundai Motor Co., *Hyong-Joon Kim, Auditor*

Kia Motors Corp., *Chung Eui Heon, Manager, International Business Development Dept., Planning & Coordinating Div.*

Kyowa Metal Works Co., Ltd., *Kunio Sawada, President*

Kia Motors Corp., *Lee Seung Wong, International Business Development Dept., Planning & Coordinating Div., Kang Seung Tai, Manager, Education & Training Center & Park o Eun, Plant General Affairs Mgt. Dept.*

Goldstar Cable Co., Ltd., Anyang Plant, *Han-Seob Suh, General Manager & Ki-Jun Um, Manager, Cable Design Dept.*

Kum Yang Otsuka Chemical Co., Ltd., *Hideitsu Inoue, President*

Shinsung Corporation, General Contractors & Engineers, *Kim Geum Hee, Designer, Planning & Management Div., Son Kyung Ho, Manager, Planning & Management Div. & Park Seoung Kwan, Section Chief*

The Federation of Korean Information Industries, *Kwon Tae Ioung, Senior Managing Director & Ji-Won Jeong, International Relations*

Korea Wiper Blade Co., Ltd., *Yoshiaki Tanaka, Vice President*

Dong Shin Pharm. Co., Ltd., *Ki Chuel Kim, Chief, Public Relations Office*

JAPAN

<Educational Institutes>

Ministry of Education, *Mr. Muneharu Iwamoto, Senior Curriculum, Specialist, for Industrial Education, Elementary and Education Bureau & Mr. Masao Homma, Director, Technical Education Division, Higher Education Bureau*

University of Tokyo, *Mr. Sun-ichi Kobayashi, Dean, Faculty of Science, Mr. Hiroyoshi Suematsu, University of Tokyo, Professor, Department of Physics & Mr. Shigeo Ozono, Professor, Department of Precision, Machinery Engineering, Chairman, Committee for International Cooperation & Exchange*

Tokyo Institute of Technology, *Mr. Toyosaka Moriizumi, Professor, Faculty of Engineering, Department of Electrical and Electronic Engineering*

Kyoto University, *Mr. Kenjiro Suzuki, Professor, Department of Mechanical Engineering*

Tokyo National College of Technology, *Mr. Susumu Masaki, Professor, Department of Electronic Engineering*

Kumamoto National College, *Mr. Hidenori Ohyama, Associate Professor, Technology Department of Electronic Engineering*

Tokyo Metropolitan College of Aeronautical Engineering, *Mr. Kiichi Yoshida, Associate Professor*

<Enterprises and others>

Sanyo Electric Co., Ltd., Audio-Video Business Headquarters, VTR & Video Systems Div., *Takeshi Uchida, General Manager, Shigeaki Mizusawa, Department Manager & Takahisa Okuda, Manager*

JICA Kansai Office, *Fumio Fujiwara, Acting Head Director*

Kawasaki Heavy Industries Ltd., *Osamu Matsuoka, Manager of Shop Works Sect.,*

Construction Dept. Sakaide Shipyard, Fumiya Hagita, Senior Manager of General Affairs and Ship Business Dept., Sakaide Shipyard & Toshio Ono, Manager, General Affairs Section

Mitsui Petrochemical Industries, *Shinichi Noguchi, Secretary to the President & Yoshiaki Nakamura, Manager, License Management Div.*

Mitsui Bussan Chemical Plant Co., *Takeo Watanabe, Asst. Manager, 2nd Chemical Plant & Machinery Dept.*

JETRO, *Yoshihiro Araki, Asst. Director, Asia-Oceania Division, Overseas Research Department & Megumi Hata, Asst. Director, Member's Relations Division, Financing & Accounting Department*

Honda Motor Co., Ltd., Suzuka Factory, *Tadashi Morooka, Manager, General Affairs Department & Katsuyoshi Sakamoto, Engineer, Engine Dept., Two-Wheeler Sect.*

Small Business National Corporation, *Kenji Itaya, Chief, Technology Development Section*

Mitsui Petrochemical Industry, Chiba Factory, *Yoshiyuki Shinohara, Manager, Administrative Department*

Kawasaki Iron and Steel Co., Ltd., Chiba Works, *Shiro Tsugawa, Manager, Administrative Department*

Appendix 5

Date :

QUESTIONNAIRE

<Industrial technology evaluation>

Interviewer:

We would like to appreciate your cooperation in advance :
Please make reply to the following items.

1. Name of enterprise
 - 1-1. Address
 - 1-2. Telephone number/Fax number
Status

2. Main activity.
 - 2-1. Outline

 - 2-2. Products or service

Main Product or Service	Production quantity or		Service amount
	1990	1993	2000 *
(1)			
(2)			
(3)			
(4)			
(5)			

* Prospect

3. Business environment

3-1. Kindly let us know your forecast on Indonesian economy trend and sector business trend, to which you belong, for one year ahead from now.

A. Domestic Economy

1. Business upturn
2. No fluctuation
3. Business setback

Your sector

1. Business upturn
2. No fluctuation
3. Business setback

()

()

3-2. Influence on business environment

What business environmental factor is most affected to your management, recently and hereafter?

1. Progress of technical innovation
2. Maturity of the goods in the market
3. Hot competition with domestic rivals
4. Market of your main products
5. Diversification of consumers' needs
6. Competition with other countries' products
7. Fluctuation of exchange rate
8. Others (concretly :

Recently ()

Hereafter ()

4. Objectives of your key management factors in your business strategy.

4-1. Objective of your management

Please select the first and second important objectives in your management.

1. To maximize the turnover or sales amounts
2. To maximize profit
3. To increase market share
4. To increase dividend
5. Stabilization of employment

6. Reinforcement of technical capability
7. Internationalization of business activity
8. Diversification of business activity
9. Others (concretely :
 - The first important factor ()
 - The second important factor ()

4-2. Advantage of your enterprise

Which item is most advantageous in your enterprise ?

1. Long experience , good popularity, famous brand name
2. Diversified product lines or multi-kind product
3. Excellent technology level
4. High market share
5. Competitive price
6. Growing market for your main product
7. Ability and motivation of your employees
8. International business activity
9. Excellent cooperative enterprise group
10. Excellent financial standing
11. Satisfactory sales network
12. Others (concretely :)
 - The first advantage for your enterprise ()
 - The second advantage for your enterprise ()

4-3. What factor is important in your business strategy?

Please select two important items from the undermentioned.

1. Reduction of unprofitable divisions
2. Development of high technical / high value-added products
3. Enlargement of production / sales scale
4. Reinforcement of technological development
5. Manpower saving and rationalization of organization and production process
6. Development of international business activity
7. Diversification of business activity
8. Reserving brand name
9. Continuation of high pricing policy
10. Others (concretely :)
 - The first important item ()

The second important item ()

4-4-A. Weakpoint in your business operation

What is the most serious weakpoint in your business operation?

Please select the most serious weakpoint

1. Shortage of human resources
2. Shortage of financial capacity
3. Lower level of manufacturing technology
4. Weakness of marketing ability
5. The number of excess personnel or surplus workers
6. Others (concretely :)

The most serious weakpoint in your business operation ()

4-4-B Shortage of human resources

What kind of human resources is insufficient in your enterprise?

Please pick out two items from the followings

1. Basic researchers
2. Applied researchers / development researchers
3. Production engineers
4. Production process engineers
5. Maintenance engineers
6. Construction engineers
7. Engineers concerning software field (system engineer, programmer etc.)
8. Technicians
9. Skilled worker
10. Semi skilled worker
11. Persons in charge of financial matter (including dealers)
12. Leaders in case of going into new business activity
13. Others (concretely :)

Answer : (), ()

4-5. Important factors of production strategy

(1) Production strategy

Please specify the most important target that you wish to pursue hereafter.

1. Reduction of raw materials and energy consumption by the improvement of production process
2. Shortening of production lead-time for new product development (standardization, shortening of unfinished items etc.)
3. Established of production system for multi-kinds / small lots
4. Automatization and rationalization by robotization of production process
5. Improvement of productivity
6. Others (concretely : _____)
The most important factor : (_____)

(2) Emphasized investment for production facilities

Please specify the most important target considered in the past three year investment.

1. Grade up production capacity
2. Automatization and rationalization
3. Introduction of facilities for new products
4. Introduction of facilities for new production and new materials
5. Maintenance / repair
6. Energy-saving / resources-saving
7. Others (concretely : _____)
The most important point : (_____)

(3) Cycle time of renewal and modification of your production facilities

Please select the current trend of the cycle time.

1. Renewal cycle is shortened by the technology development
2. Renewal cycle is shortened by the diversification and advancement of customers' needs
3. Renewal cycle is extended by better quality of workforce
4. Renewal cycle is extended by price stabilization of raw materials and fuel
5. No change of renewal cycle
6. Others (concretely : _____)
The most important factor (_____)

(4) Average age of production facilities
Age of your main production facilities in average
Please select the number

- | | | |
|----------|---|----------|
| 1. Under | | 3 years |
| 2. 3 | - | 5 years |
| 3. 5 | - | 7 years |
| 4. 7 | - | 10 years |
| 5. 10 | - | 15 years |
| 6. Over | | 15 years |

()

(5) Ratio of new production facilities
How is the percentage of facilities which have been purchased within
the last three years?

- | | | |
|----------|---|-----|
| 1. Under | | 10% |
| 2. 10 | - | 20% |
| 3. 20 | - | 30% |
| 4. 30 | - | 40% |
| 5. 40 | - | 50% |
| 6. Over | | 50% |

()

5. Human resources

5-1. The number of employees

Please fill in the figures of person in the following list

	End of 1990	End of 1993	End of 2000 *
Total number			
(Break-down)			
Top management (president, director etc.)			
Production division			
Maintenance division			
Quality control division			
Construction division			
Business Activity. Sales division			
Research & development division			
Administration division (personnel, general affairs, planning, finance, etc.)			

* Prospect

5-2. Engineering Manpower

Definition

Engineer : The person graduated from university / college, the person qualified for D-4 grade or the qualified person as an engineer by your enterprice

Technician : The person graduated from polytechnics, the person qualified for D1 - D3 or the qualified person as a technician by your company

Skilled worker: The person graduated from technical high school or the operators of computers and other types of equipment requiring specialized skills (laboratory equipment, agricultural machinery, etc) or machinery operators with education until age 15, plus 10 years operating experience.

	Engineer			Technician			Skilled Worker		
	1990	1994*	2000	1990	1994*	2000	1990	1994*	2000
Chemical									
Civil									
Electrical									
Production									
Mechanical									
Metallurgy									
Mining-Petroleum									
Aeronautical									
Electronics									
Nuclear energy									
Bio-technology									
Data Processing & Computer									
Architect									
Others									

* Current number shortage (-) or surplus (+) number

5-3. Education and training system for employees

On which points do you focus in the education and training of employees?

1. Level-up of manufacturing technique
2. Production control / quality control
3. Improving quality of work force
4. others (concretely : _____)

Plural answers, will be allowed. () () ()

(Remark) If you do not have any education and training system for employees, you need not pick out.

5-4. Morale of employees

What kind of incentive and education opportunity do you provide in order to promote morale of employees?

Please mark an asterisk in each parenthesis when you have adopted the system.

1. Opportunity of abroad education or training ()
2. Opportunity of domestic education or training system (outside your enterprise one year or more) ()
3. Flexible working time system in office or Shopfloor ()
4. A paid vacation system for getting education and/or training ()
5. A long term paid vacation system (one month or more) ()
6. Reward system for good work performance (wage raise, etc.) ()
7. Pay according to ability ()
8. Pay according to authorized qualification ()
9. Others (concretely :) ()

5-5: Problem of employees

What is the most serious problem regarding employees in your enterprise?

Please select single item from followings.

1. Decline of morale
 2. High mobility from your enterprise
 3. Aging of employees
 4. Shortage of operators for automation system
 5. Shortage of persons in charge of maintenance of equipment and machinery
 6. Increase in education and training expenses
 7. Others (concretely :)
- The most serious problem ()

6. Main factors of marketing strategy

4. Subsidiary production company in the target country [Manufacturing division]
5. Export from above targeted country to the third country.

7-2. Evaluation of internationalization

How do you evaluate the implementation of the internationalization strategy?

Please pick up one from the following:

1. Very smooth implementation
2. Smooth implementation
3. Re-consideration of the strategy is necessary
4. Negative result at present
5. Others (concretely : _____)
(_____)

8. Strategic factor for research and development

8-1. Percentage of research and development expenses

How is the percentage of research and development expenses to total sales amount in your company?

Please pick up one

- | | | | |
|----|----------|-----------|------|
| 1. | Under | 1% | p.a. |
| 2. | 1 - | 2% | p.a. |
| 3. | 2 - | 4% | p.a. |
| 4. | 4 - | 6% | p.a. |
| 5. | 6 - | 10% | p.a. |
| 6. | Over | 10% | p.a. |
| | Answer : | (_____) | |

8-2. Break down of research and development expenses

Please specify each percentage among the total research and development expenses.

- | | | |
|----|--------------------------------|-----------|
| 1. | Basic research | : _____ % |
| 2. | Applied research | : _____ % |
| 3. | New product development | : _____ % |
| 4. | Production process development | : _____ % |
| | | _____ |
| | | 100% |

Date:

Questionnaire

(for engineers, technicians, skilled workers)

Interviewer:

A. General Questions

1. Name of enterprise
2. Respondent's position in the enterprise
3. What are you in charge of?
 - (1) R/D
 - (2) Production process development
 - (3) Production control
 - (4) Production operation
 - (5) Maintenance & Repair
 - (6) Other detail
4. How do you think the level of the technology concerned in, comparing with that of other companies?
Please select one item in the followings ()
 - (1) Excellent, (2) Good, (3) Average, (4) A little worse, (5) Worse
5. Please explain why you select above item by marking following reasons.
(Plural choices are allowable)
 - (1) (a) New equipment machine and tools
(b) Old equipment machine and tools
 - (2) (a) High technological level of concerned staff or workforce
(b) Low technological level of concerned staff or workforce
 - (3) Lack of information and knowledge
 - (4) (a) Shortage of the numbers of E.T.SW. (Engineer, Technician, Skilled Worker)
(b) Abundant numbers of E.T.SW
 - (5) (a) Better production control and quality control

(b) Poor production control and quality control

(6) Other advantages

- (a) Flexible manufacturing
- (b) Motivated workforce
- (c) Sophisticated production facility
- (d) High investment

Answer : (), (), (), (), ()

6. Which kind of improvements are desirable for you?
(Plural choices are allowable).

- (1) Renewal of equipment, machinery and tools
- (2) Development of new technology or introduction of licensed technology
- (3) Level-up of engineers, technicians, and skilled workers - E.T.SW - by on-the-job training
- (4) Increasing the numbers of E.T.SW.
- (5) Collection of information and knowledge.

Answer :

7. Please point out the problems concerning to your daily work, if any, and mention your desire or recommendation to solve the problems.

Problems :

Request to the government :

Request to the enterprise :

Your self-helping effort :

8. The number of engineers, technicians, and skilled workers in your division

Engineers : The person graduated from university/college, the person qualified for D-4 grade or the qualified person as an engineer by your enterprise.

Technician : The person graduated from polytechnics, the person qualified for D1 - D3 or the qualified person as a technician by your enterprise.

Skilled worker: The person graduated from technical high school or the operators of computers and other types of equipment requiring specialized skills (laboratory equipment, agricultural machinery, etc.) or machinery or equipment operators with education until age 15, plus 10 years or more operating experience.

The numbers of existing persons, Surplus (+), Shortage (-) as of end March, 1994

	Engineers			Technician			Skilled Worker		
	Existing	Surplus	Shortage	Existing	Surplus	Shortage	Existing	Surplus	Shortage
Chemicals									
Civil									
Electrical									
Production									
Mechanical									
Metallurgy									
Mining/Petroleum									
Aeronautical									
Electronics									
Nuclear Energy									
Bio-technology									
Data Processing & Computer									
Architect									
Others									
Total									

B. Personal Questions

1. Education background

- (1) Which university, polytechnics or high school did you graduate?
- (2) When did you graduate from the last school?
- (3) What kind of degree level do you have?
Ex, Dr, S1, D4, - D1, others?
- (4) What was your special study?

2. (1) What kind of enterprise did you get a job with after graduation?

Kind of enterprise (Ex.chemistry) :

Name of enterprise :

Reason why you selected it :

(2) How many times have you changed enterprises so far?

Times of change :

The biggest reason of change (Ex. higher salary, more suitable job to you etc.) :

The second biggest reason of change (circumstances of your family, etc.):

(3) What factors are important or difficult for you when you change your job?

Please mark on following items :

- a) salary,
- b) suitable job to you or not,
- c) poor work environment,
- d) circumstances of your family,
- e) geographical distance,
- f) other (concretely :)

3. Have you participated in the in-house education courses provided by the enterprise?

a) How was the result in case of "Yes"

Very effective ()

Partly effective ()

Doubtful ()

Not effective ()

- b) Why could not you join it?
- There was no instructive or useful subject to you ()
 - There was no time to join because of busyness ()
 - It was quite expensive for you to take the education or training ()
 - Other reason ()

4. What kind of "on-the-job training" were you provided?

- Quick task related instruction ()
- Specialized skill training ()
- Training for general technical capacity ()

5. Have you taken part in public or external education or training courses?
Please mark an asterisk (*) in each parenthesis or fill in.

- (1) How many years ago
10 years (), 5 years (), 3 years (), within 1 year ()
- (2) What was your objective or aim?
- To upgrade your professional capability ()
 - To improve your general capability ()
 - To cultivate yourself ()
 - Others ()

6. Please describe your past training :

	Name of Training	Provider	Objective
1)			
2)			
3)			

List of Responses to Questionnaire

QUESTIONNAIRE

3. Business environment

3-1. Kindly let us know your forecast on Indonesian economy trend and sector business trend, to which you belong, for one year ahead from now.

- A. Domestic Economy
 1. Business upturn
 2. No fluctuation
 3. Business setback

- B. Sector
 1. Business upturn
 2. No fluctuation
 3. Business setback

3-2. Influence on Business environment

What business environmental factor is most affected to your management, recently and hereafter?

1. Progress of technical innovation
 2. Maturity of the goods in the market
 3. Hot competition with domestic rivals
 4. Market of your main products
 5. Diversification of consumers' needs
 6. Competition with other countries' products
 7. Fluctuation of exchange rate
 8. Others

4. Objectives of your key management factors in your business strategy.

4-1. Objective of your management

Please select the first and second important objectives in your management.

1. To maximize the turnover or sales amounts
 2. To maximize profit
 3. To increase market share
 4. To increase dividend
 5. Stabilization of employment
 6. Reinforcement of technical capability
 7. Internationalization of business activity
 8. Diversification of business activity
 9. Others

[Responses to Questionnaire]

[Unit: Enterprise]

A	B	C	D	E	F	G	H	I	J	K	L	Total
3	2	3	3	1	2	1	2	1	1	1	1	21
		1	1	1	1				1			5
												26
			1	1	1		1	1	1	1	1	21
							1			1		4
										1		1
												26
1				1	2					1	1	6
3	2	1	1	2	1	1	1	1	1			12
		2	1	1	1					1		5
				1	1							1
		1	1	1	1	1	1	1			1	6
		1		1	1							2
			2	1			1					4
												37
1		1	3	2	1	1	1	1	1	1	1	10
4	1	3	1	2	3	1	2	1	1	1	1	13
1									1			9
1												1
2	1	1	3		3		1	1		1		10
		2	1									6
		1	1									2
											1	1
		1										1
												53
A	B	C	D	E	F	G	H	I	J	K	L	Total

[Surveyed Establishments by Sector]

A Household electrical appliance	3
B Automobile	2
C Machinery	4
D Petrochemistry and other chemistry	5
E Fertilizer/Agricultural chemicals	2
F Metal/Metal fabrication/Mining	3
G Paper manufacturing	1
H Wood products	3
I Foodstuff	1
J Construction/Engineering	2
K Software industry	1
L Mining	1
Total	28

{Responses to Questionnaire}

4-2. Advantage of your enterprise

Which item is most advantageous in your enterprise?

1. Long experience, good popularity, famous brand name
2. Diversified product lines or multi-kind product
3. Excellent technology level
4. High market share
5. Competitive price
6. Growing market for your main product
7. Ability and motivation of your employees
8. International business activity
9. Excellent cooperative enterprise group
10. Excellent financial standing
11. Satisfactory sales network
12. Others

	A	B	C	D	E	F	G	H	I	J	K	L	Total
3	1	1	2	1	1	1	1	1	2	1	1	1	14
4	1	1	1	1	1	1	1	1	1	1	1	1	4
7	2	1	1	1	2	1	1	1	1	1	1	1	7
3	1	1	1	1	1	1	1	1	1	1	1	1	3
7	1	1	1	3	1	1	1	1	1	1	1	1	7
5	1	1	1	1	1	2	1	1	1	1	1	1	5
5	1	1	1	1	1	2	1	1	1	1	1	1	5
2	1	1	1	1	1	2	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	3
-													-
													54

4-3. What factor is important in your business strategy?

Please select two important items from the undermentioned.

1. Reduction of unprofitable divisions
2. Development of high technical/high value-added products
3. Enlargement of production/sales scale
4. Reinforcement of technological development
5. Manpower saving and rationalization of organization and production process
6. Development of international business activity
7. Diversification of business activity
8. Reserving brand name
9. Continuation of high pricing policy
10. Others

1	1	1	1	1	1	1	1	1	1	1	1	1	4
12	1	1	3	1	1	2	1	1	1	2	1	1	12
13	1	1	2	3	2	1	1	1	1	1	1	1	13
4	1	1	2	2	1	2	1	1	1	1	1	1	4
2	1	1	1	1	1	1	1	1	1	1	1	1	2
3	1	1	1	1	1	1	1	1	1	1	1	1	3
2	1	1	1	1	1	1	1	1	1	1	1	1	2
4	1	1	1	2	1	1	1	1	1	1	1	1	4
1	1	1	1	1	1	1	1	1	1	1	1	1	1
													45

4-4-A. Weakpoint in your business operation

What is the most serious weakpoint in your business operation?

Please select the most serious weakpoint

1. Shortage of human resources
2. Shortage of financial capacity
3. Lower level of manufacturing technology
4. Weakness of marketing ability
5. The number of excess personnel or surplus workers
6. Others

2	1	2	2	1	1	1	1	1	1	1	1	1	8
6	1	1	1	2	1	1	1	1	1	1	1	1	6
3	1	1	1	1	1	1	1	1	1	1	1	1	3
6	1	2	1	1	1	1	1	1	1	1	1	1	6
3	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	1	1	1	1	1	1	1	1	1	1	1	1
													27
													Total

[Responses to Questionaire]

4-4-B. Shortage of human resources

What kind of human resources is insufficient in your enterprise?

Please pick out two items from the followings

1. Basic researchers
2. Applies researchers/development researchers
3. Production engineers
4. Production Process engineers
5. Maintenance engineers
6. Construction engineers
7. Engineers concerning software field (system engineer, programmer etc.)
8. Technicians
9. Skilled worker
10. Semi skilled worker
11. Persons in charge of financial matter (including dealers)
12. Leaders in case of going into new business activity
13. Others

	A	B	C	D	E	F	G	H	I	J	K	L	Total
1				1	1		1			1			4
2				1	1		1			1			7
3	1			1									3
4	1	1		1									6
5	1	1		1		2							2
6	1					1							1
7				2		1				1		1	5
8		1				1							2
9				2		1				1			7
10	1			1		2		1					1
11													-
12					1			1			1	1	4
13													-
													42
(1) Production strategy													
Please specify the most important target that you wish to pursue hereafter													
1	1			2	1	1		1					7
2	2		1			1					1		5
3				1									1
4		1						1					2
5	1		3	2	2	3	1		1	1	1	1	16
6								1					1
													32
(2) Emphasized investment for production facilities													
Please specify the most important target considered in the past three years investment.													
1	3		4	3	1	2	1		1	1	1	1	18
2		1				1		1				1	5
3	1	1											-
4													-
5				1		1	1						2
6	1			2	1	1	1		1				5
7								1					1
													31
	A	B	C	D	E	F	G	H	I	J	K	L	Total

[Responses to Questionnaire]

(3) Cycle time of renewal and modification of your production facilities
Please select the current trend of the cycle time.

1. Renewal cycle is shortened by the technology development
2. Renewal cycle is shortened by the diversification and advancement of customers' needs
3. Renewal cycle is extended better quality of workforce
4. Renewal cycle is extended by price stabilization of raw materials and fuel
5. No change of renewal cycle
6. Others

(4) Average age of production facilities
Age of your main production facilities in average
Please select the number

1. Under 3 years
2. 3 - 5 years
3. 5 - 7 years
4. 7 - 10 years
5. 10 - 15 years
6. Over 15 years

(5) Ratio of new production facilities
How is the percentage of facilities which have been purchased within the last three years?

1. Under 10%
2. 10 - 20%
3. 20 - 30%
4. 30 - 40%
5. 40 - 50%
6. Over 50%

5-3. Education and training system for employees
On which points do you focus in the education and training of employees?

1. Level-up of manufacturing technique
2. Production control/quality of control
3. Improving quality of work force
4. Others

A	B	C	D	E	F	G	H	I	J	K	L	Total
		1										1
		2		1	1		1					5
1		2	2	1	1			1			1	9
		1	2			1						4
1			1									2
1	1											2
												23
						1		1				-
			1	1		1			1			2
		1	1		1					1		4
				1			1					3
2	2			1		1	1					7
		1		1							1	4
												20
			1	3			1	1			1	7
1												1
1					1					1		3
				2	1							3
1								1				2
		2										2
												18
1	1	3	2	1	2	1		1			1	13
2	1	3	4	1	2		1		1		1	17
2	1	4	4	2	1				1		1	16
												46
A	B	C	D	E	F	G	H	I	J	K	L	Total

5-4. Moral of employees

What kind of incentive and education opportunity do you provide in order to promote moral of employees?

Please mark an asterisk in each parenthesis when you have adopted the system.

1. Opportunity of abroad education or training
2. Opportunity of domestic education or training system
3. Flexible working time system in office or Shopfloor
4. A paid vacation system for getting education and/or training
5. A long term paid vacation system (one month or more)
6. Reward system for good work performance(wage raise, etc.)
7. Pay according to ability
8. Pay according to authorized qualification
9. Others

[Responses to Questionnaire]

A	B	C	D	E	F	G	H	I	J	K	L	Total
3	1	2	1	2			2		1		1	13
2	1	3	2	1	1		1		1		1	13
					1							1
1	1		2				1					5
	1		2	1								4
3	1	2	1	2	2	1	2	1	1		1	17
1	1	1	3	1		1	1		1			10
2	1	1	1	1		1	1					8
												-
												71
1	1								1			3
	2	1		1		1			1			6
		1	1	1	1	1	1				1	4
		1	1		2		1					5
		1	1	1				1				3
		1		1				1				3
1												1
												23
A	B	C	D	E	F	G	H	I	J	K	L	Total

QUESTIONNAIRE

[Responses to Questionnaire]

6. Main factors of marketing strategy

6-1. Development for marketing

Kindly select the first and second important items in the strategy.

1. Strengthening of sales power
2. Increasing efficiency of product distribution system
3. Institutional reinforcement to catch market needs
4. Reviewing, reorganization and reinforcement of sales channel
5. Active introduction of new products
6. Active introduction of new products
7. High pricing policy
8. Reinforcement of follow-up service and response to complaints
9. Improving enterprise image
10. Others

A	B	C	D	E	F	G	H	I	J	K	L	Total
1		3	1	1	1	1	1	1	1			10
1			2	2	2		1					8
			1									1
				1						1		2
		1			1							2
1			1	1			2				1	6
												-
2		3			1	1				1	1	9
		1	1					1				3
												-
												41
6-2. Present problems of main products												
What kind of problems are you facing to now, regarding your main products?												
Please pick up the most serious item												
3	1	2	2		2	1	2	1	1	1		16
	1											1
1		2			1				1			5
	1									1		2
			2	1								3
				1							1	2
												29
7. Strategic factors for internationalization												
7-1. Development of internationalization												
Which level of internationalization stage does your enterprise stay on?												
Please pick up one from the following												
			3	1		1		1				6
					1	1		2	1		1	6
					1	1						1
												2
		1	1									3
2						1						1
1												1
												20
A	B	C	D	E	F	G	H	I	J	K	L	Total

{Responses to Questionnaire}

8-4. Situation of research and development

How does your enterprise perform R & D activity?

Please mark and in each parenthesis, if you have adopted it.

1. Utilization of subsidiary company
2. Collaboration with domestic enterprise related in business
3. Collaboration with domestic enterprise of different sectors
4. Establish of your own research institute
5. Collaboration with domestic universities
6. Collaboration with overseas companies
7. Collaboration with overseas universities
8. Irregular (H) recruiting of employees
9. Merger and acquisition

(H) On the spot basis, namely different from regular recruiting of annual graduates from universities, polytechnics etc.

8-5. Weakpoint of research and development

Please specify the most serious problem you are facing during research and development.

1. Shortage of funds
2. Shortage of human resources
3. Shortage of information quantity
4. Others

A	B	C	D	E	F	G	H	I	J	K	L	Total
				1	1		1					3
				2	1							3
				1	1							1
						1						2
		2	1	2							1	5
			2	2								4
												-
				1								1
												19
			1	1	1	1		1			1	5
			1	1	2	1						5
				1								1
												11
A	B	C	D	E	F	G	H	I	J	K	L	Total

Appendix 6

1. Population of Establishments

(1) Estimated population and samples

In September, 1995, with help of BPS staffs, the Study Team completed to estimate numbers of current establishments in Indonesia. The figures are listed in following Table-1.

Table-1: Estimated population of establishments

According to the above estimation, there were total 18,501,598 establishments in Indonesia in 1994 (neglecting establishments with employees less than 5). However, this figure includes 9,505,385 "small" agriculture establishments and 5,740,146 "small" trade establishments. These establishments are thought to be akin to families of farmers and self-employed peddlers. Therefore, excluding these, size of population group for the Establishment Survey is reasonably estimated as not exceeding 3,256,067. Even so, still one has to pay attention to 957,474 "small" transportation and 1,509,492 "small" service establishments which would include not a small number of too private or traditional entities which cannot be counted in parallel to other establishments.

Given this population size, 3,156 samples of the Establishment Survey falls in 0.10% of current Indonesian establishments. This sampling ratio is invisibly small, however, sampling strategy taken by the Study Team lead to samples of 1.61% in "large" establishments and 0.25% of "medium" establishments. For manufacturing industries, much more satisfactory rates of samples were collected – 11.24% in "large" manufacturing establishments and 3.86% "medium" manufacturing establishments. Bias of collected samples is not seen in view of regions. Refer to sampling evaluation table below.

Table-2: Evaluation of collected samples

(2) Verification of collected samples

(2)-1 Employees

Following figures are numbers of employees to be estimated with average numbers of employees in the survey (sum of four categories of employees Q17) per an establishment of every size, sector and region to be multiplied by correspondent sizes of population (figures in bracket show reliable ranges in 90% significance).

Table-3: Estimated numbers of employees

Large:	22,790,724	(15,418,905 ~ 30,302,353)
Medium:	19,094,684	(16,073,595 ~ 22,115,773)
Small:	119,563,112	(108,474,560 ~ 130,651,665)
Total:-	161,448,520	(139,967,060 ~ 183,069,791)
		n=3,156, N=18,501,598

Apparently, the estimated figure is enormous. So, "small" agricultural establishments and "small" trade establishments both in question shall be deducted to lead to total estimated employees as 69,153,285 (N=3,256,067; reliable range in 90% significance: 52,680,402 to

85,765,978). This figure seems reasonable referring to February 1993 SAKERNAS survey. The SAKERNAS data estimates current employees (over 10 years old and with experience of work in the previous week) as 80,322,991 which leads to 64,589,327 after deducting self-employed persons.

Consequently, samples of the Establishment Survey can be said to generally reflect distribution of population in view of employment data. However, one must be careful to analyze the result because of its huge relative error, 48% ($\pm 24\%$).

(2)-2 Engineers

Following figures are numbers of engineers (who are on work as engineer irrespective of their academic careers) to be estimated with the Establishment Survey like above employees. Here, "small" agricultural and trade establishments have already been deducted from calculation.

Table-4: Estimated numbers of engineers

Large:	172,034	(41,080 -	304,305)
Medium:	247,726	(33,605 -	484,335)
Small:	1,973,296	(9,925 -	5,105,504)
Total:-	2,393,056	(84,611 -	5,894,143)
		n=2,827,	N=3,256,067

In the above number of engineer at "small" establishments (1,973,296), 1,731,655 at transportation establishments are included unreasonably. If it is excluded, engineers at "small" establishments are 241,641 and total engineers come to 661,401 (N=2,298,593; reliable range in 90% significance: 84,611 to 1,404,423). This figure is still enormous compared to 1990 Population Census and Employment Table which show total researcher (KJI01) and design/engineer (KJI02) as 78,089. Even after the Study Team's recategorization, it makes only 344,488.

On the other hand, when engineer is defined as technical specialists graduating universities (*engineer* following notation in Part-II), Establishment Survey estimates the total number as 439,706 (N=2,298,593; reliable range in 90% significance: 98,135 to 872,769). Among them, 115,096 persons (reliable range in 90% significance: 0 to 498,411) are estimated to be at planing/design and production related works. They are still bigger than Census based figures, anyway.

So, it will be reasonable to estimate the current number of engineers as 419,760 (reliable range in 90% significance: 74,686 to 788,639) neglecting figure of all "small" establishments (N=514,338) in above Table-4. It means that one should analyze engineer related issues excluding samples of "small" establishments (n=2,256).

(2)-3 Technicians

Following figures are numbers of technicians (who are on work as technician irrespective of their academic careers) to be estimated with the Establishment Survey like above employees and engineers. Here, "small" agricultural and trade establishments have already been deducted from calculation.

Table-5: Estimated numbers of technicians

Large:	413,952	(144,163 ~	704,304)
Medium:	423,499	(136,172 ~	744,444)
Small:	1,226,600	(24,823 ~	3,043,923)
Total:-	2,064,051	(305,158 ~	4,492,671)
		n=2,827, N=3,256,067	

1990 Population Census and Employment Table, after the Study Team's recategorization, lead to 2,095,648 technicians, which are similar to above total figure. On the other hand, when technician is defined as technical specialist with D1/D2/D3 degrees (*technician* following notation in Part-II), Establishment Survey leads to the total number as 728,706 (N=3,256,067; reliable range in 90% significance: 155,348 to 1,458,931). This is too small.

Consequently, samples of the Establishment Survey can be said to generally reflect distribution of population in view of technicians. However, too much relative error at "small" establishments (246%) makes scrutinizing impossible.

(2)-4 Skilled workers

Following figures are numbers of skilled workers (who are on work as skilled workers irrespective of their academic careers) to be estimated with the Establishment Survey like above employees, engineers and technicians. Here, "small" agricultural and trade establishments have already been deducted from calculation.

Table-6: Estimated numbers of skilled workers

Large:	2,449,810	(1,259,135 ~	3,669,174)
Medium:	5,469,682	(3,626,918 ~	7,332,538)
Small:	14,759,664	(5,894,125 ~	24,924,180)
Total:-	22,679,156	(10,780,177 ~	35,925,892)
		n=2,827, N=3,256,067	

This figure is enormous compared to 1990 Population Census and Employment Table which show total skilled workers as 11,893,035, after recategorization by the Study Team. Therefore, "small" transportation establishments shall be excluded from the above table to make total number as 18,955,155 (N=2,298,593; reliable range in 90% significance: 10,049,534 to 28,892,684).

On the other hand, when skilled worker is defined as technical experts graduating high school (*skilled worker* following notation in Part-II), Establishment Survey leads to the total number as 14,791,353 (N=2,298,593; reliable range in 90% significance: 8,733,489 to 21,006,794). The figure is close to above two figures.

Consequently, samples of the Establishment Survey can be said to generally reflect distribution of population in view of skilled workers, if "small" transportation is omitted.

(3) Conclusion -- sample weight

According to the above verification, following weights shall be applied for analyses using the Establishment Survey data:

- Problems related to engineer and technician
Inversed sampling ratios of every size-sector-region group, excluding all "small" establishments (n=2,256 N=514,338)

- Problems related to skilled worker
Inversed sampling ratios of every size-sector-region group, excluding "small" agriculture, trade and transportation establishments (n=2,794 N=2,298,593)
- Problems related to general employee
Inversed sampling ratios of every size-sector-region group, excluding "small" agriculture and trade establishments (n=2,827 N=3,256,067)

Table-1

<Large>	Sumatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLU 10	560	682	73	175	83	1,573
20	109	57	65	12	24	267
31	192	744	24	41	38	1,039
32	34	1,609	2	12	42	1,699
33	168	489	165	37	26	885
34	17	219	1	2	1	240
35	159	714	34	3	1	911
36	11	255	2	4	3	275
37	11	75	0	2	0	88
38	85	671	3	2	2	763
39	4	126	0	0	3	133
40	15	39	6	6	9	75
50	0	73	0	0	0	73
60	5,964	24,963	3,049	2,553	4,161	40,690
70	515	1,765	239	151	189	2,860
80	24	700	19	13	18	774
90	2,391	11,446	832	1,596	1,520	17,785
(Total)	10,259	44,628	4,514	4,609	6,120	70,130

<Medium>	Sumatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLU 10	220	1,567	90	25	57	1,949
20	1,650	2,370	358	191	375	4,944
31	531	3,145	47	134	117	3,974
32	129	2,396	6	66	163	2,760
33	349	828	164	105	96	1,542
34	61	457	6	16	28	568
35	198	1,027	33	27	17	1,302
36	143	1,056	15	33	64	1,311
37	8	43	1	2	0	54
38	154	1,015	23	29	15	1,236
39	12	195	0	5	21	233
40	59	69	28	31	35	222
50	597	1,603	347	346	431	3,324
60	26,628	166,721	9,891	17,581	15,068	235,889
70	1,629	3,507	2,323	1,012	2,905	11,376
80	872	3,768	263	417	361	5,681
90	24,248	126,885	5,438	4,791	6,481	167,843
(Total)	57,488	316,652	19,023	24,811	26,234	444,208

<Small>	Sumatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLU 10	3,016,789	2,939,636	1,155,514	1,139,590	1,253,856	9,505,385
20	10,102	54,463	1,499	5,773	12,691	84,528
31	7,032	23,667	92	3,356	920	35,067
32	3,437	20,930	0	495	2,593	27,455
33	1,606	19,305	1,610	1,139	1,918	25,778
34	249	780	0	0	62	1,091
35	398	754	0	0	0	1,152
36	1,732	22,866	0	1,917	1,310	27,825
37	0	0	0	0	0	0
38	172	3,962	46	0	341	4,521
39	620	1,249	0	46	186	2,101
40	5,455	7,780	960	1,258	329	15,782
50	10,078	15,282	4,709	4,829	5,631	40,529
60	840,871	4,139,222	215,290	280,659	264,104	5,740,146
70	60,754	426,476	441,596	14,279	14,369	957,474
80	662	7,684	50	41	497	8,934
90	170,089	1,153,608	46,150	68,723	70,922	1,509,492
(Total)	4,130,246	8,837,664	1,867,516	1,522,105	1,629,729	17,987,260

<Total>	Sumatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLU 10	3,017,569	2,941,885	1,155,667	1,139,790	1,253,996	9,508,907
20	11,861	56,890	1,922	5,976	13,090	89,739
31	7,755	27,556	163	3,531	1,075	40,080
32	3,600	24,935	8	573	2,798	31,914
33	2,323	20,622	1,939	1,281	2,040	28,205
34	327	1,456	7	18	91	1,899
35	755	2,495	67	30	18	3,365
36	1,886	24,177	17	1,954	1,377	29,411
37	19	118	1	4	0	142
38	411	5,648	72	31	358	6,520
39	636	1,570	0	51	210	2,467
40	5,529	7,888	994	1,295	373	16,079
50	10,675	16,958	5,056	5,175	6,062	43,926
60	873,463	4,330,906	228,230	300,793	283,333	6,016,725
70	62,898	431,749	444,158	15,442	17,463	971,710
80	1,558	12,152	332	471	876	15,389
90	196,728	1,291,939	52,420	75,110	78,923	1,695,120
(Total)	4,197,993	9,198,944	1,891,053	1,551,525	1,662,083	18,501,598

Table-2

"Large"	Smatera	Jawa	Kalimantan	Kalimantan	Others	(All)	"Small"	Smatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLUI 10	-	-	○	-	-	-	KLUI 10	x	x	x	-	-	x
20	-	-	-	-	-	-	20	-	-	-	-	-	-
31	○	○	-	○	○	○	31	-	x	-	x	-	x
32	○	○	-	-	-	○	32	x	x	-	-	x	x
33	○	○	○	○	○	○	33	-	x	-	-	x	x
34	○	○	-	-	-	○	34	-	-	-	-	-	-
35	○	○	○	-	-	○	35	-	-	-	○	-	-
36	○	○	-	-	○	○	36	-	x	-	x	x	x
37	○	○	-	-	-	○	37	○	○	-	-	-	○
38	○	○	-	○	○	○	38	○	x	-	-	-	-
39	○	○	-	-	-	○	39	-	x	-	-	-	x
40	○	○	-	-	-	○	40	-	-	-	-	-	-
50	○	○	○	○	○	○	50	x	x	x	x	x	x
60	x	x	x	x	-	x	60	x	x	x	x	x	x
70	-	-	x	-	-	-	70	x	x	x	x	x	x
80	○	○	○	○	○	○	80	-	-	○	○	-	-
90	x	x	x	-	-	x	90	x	x	x	x	x	x
(Total)	-	-	-	x	-	-	(Total)	x	x	x	x	x	x

"Medium"	Smatera	Jawa	Kalimantan	Sulawesi	Others	(All)	Total:	Smatera	Jawa	Kalimantan	Sulawesi	Others	(All)
KLUI 10	-	x	-	-	-	-	KLUI 10	x	x	x	-	x	x
20	x	x	x	-	-	x	20	x	x	x	-	-	x
31	-	-	○	-	-	-	31	-	-	-	x	-	-
32	-	-	-	-	-	-	32	x	-	-	x	x	-
33	○	-	-	○	○	○	33	-	-	-	-	-	-
34	-	-	-	-	○	-	34	-	-	-	-	-	-
35	-	-	○	-	-	-	35	-	-	○	○	-	-
36	-	-	○	○	-	-	36	-	-	○	x	x	-
37	○	○	-	-	-	○	37	○	○	-	-	-	○
38	-	-	-	-	-	-	38	-	-	-	-	x	-
39	-	-	-	-	-	-	39	x	-	-	-	-	-
40	-	○	-	-	-	-	40	x	x	-	-	-	x
50	○	-	-	-	-	-	50	-	-	x	x	x	-
60	x	x	x	x	x	x	60	x	x	x	x	x	x
70	x	-	x	x	x	-	70	x	x	x	x	x	x
80	-	-	○	-	-	-	80	-	-	○	-	-	-
90	x	x	x	-	-	x	90	x	x	x	x	x	x
(Total)	x	x	x	x	x	x	(Total)	x	x	x	x	x	x

Remarks: ○ Sampling ratio is more than 4.76% (the second tripartite)
 x Sampling ratio is less than 0.45% (the first tripartite)
 - Between above two sampling ratios
 (no mark) No samples

Appendix 7

THE ESTABLISHMENT SURVEY

Note: In the survey, the following definitions of engineer, technician, and skilled worker were used.

<p>ENGINEERS (university graduates with technical engineering degree)</p>	<p>TECHNICIANS (polytechnic graduates D1, D2, D3)</p>	<p>SKILLED WORKERS (STLA graduates working with machines or computers OR STLP education + 10 years technical experience)</p>
--	--	--

TABLE OF CONTENTS

		Page
Appendix 7.1	Establishment Manpower Questionnaires (Indonesian English Languages)	A7-2
Appendix 7.2	Establishment Manpower Questionnaires (Indonesian Languages)	A7-19
Appendix 7.3	The Establishment Survey's Results	A7-36

DEPARTMENT OF MANPOWER OF INDONESIA
MANPOWER PLANNING DEVELOPMENT BOARD

In cooperation with :

JAPAN INTERNATIONAL COOPERATION AGENCY

No. Q

KLUI

ID

QUESTIONNAIRE

ENGINEERING MANPOWER DEVELOPMENT PLANNING STUDY IN INDONESIA

INTRODUCTION : This study will investigate the situation of engineers, technicians, and skilled workers in Indonesia. Your organization was carefully selected for this study. Information you provide is very important for government planning for education of engineers, technicians, and skilled workers. Therefore, all information provided from you during this study is strictly confidential according to the applicable laws.

If you have any questions, please contact Depnaker:

1. Depnaker Interviewer name _____
2. Depnaker telephone _____
3. Depnaker address _____

4. ENTERPRISE NAME

5. CORRECT ADDRESS

Sub-Province:
Province:

Please write answers for 6, 7, & 8.

6. ENTERPRISE CONTACT PERSON

7. ENTERPRISE TELEPHONE

8. ENTERPRISE FAX

SECTION 1. OUTLINE OF ENTERPRISE

9	Type of enterprise (check ONE)	a. <input type="checkbox"/> Government enterprise b. <input type="checkbox"/> Corporation (many shareholders) c. <input type="checkbox"/> Cooperative d. <input type="checkbox"/> Corporation (few shareholders) e. <input type="checkbox"/> Company with 1 owner
10	Financial capital (check ONE)	a. <input type="checkbox"/> Indonesian capital (PMDN) b. <input type="checkbox"/> Foreign capital (PMA) c. <input type="checkbox"/> Joint venture d. <input type="checkbox"/> Government enterprise (BUMN) e. <input type="checkbox"/> Others (excluding a-d)
11	Type of industry	a. <input type="checkbox"/> Agriculture b. <input type="checkbox"/> Mining & oil c. <input type="checkbox"/> Manufacturing d. <input type="checkbox"/> Electricity, gas, & water e. <input type="checkbox"/> Construction f. <input type="checkbox"/> Hotel, restaurant, wholesale, retail g. <input type="checkbox"/> Transport & communications h. <input type="checkbox"/> Banking and financial institution i. <input type="checkbox"/> Services
12	Main product	<hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <hr style="border: 0; border-top: 1px solid black;"/>
13	Does your enterprise use technology from a foreign partner? (check ONE)	a. <input type="checkbox"/> Yes b. <input type="checkbox"/> No
14	Does your enterprise: a. develop new products? b. do research & development? (Check ONE)	a. <input type="checkbox"/> Yes b. <input type="checkbox"/> No a. <input type="checkbox"/> Yes b. <input type="checkbox"/> No

15	Does your enterprise cooperate with educational institutions to introduce advanced technology? (Check ONE)	a. <input type="checkbox"/> Yes b. <input type="checkbox"/> No
----	--	---

16	Write the year operations begun	Year :
----	---------------------------------	--------------

17	Write the number of employees in April 1, 1994.	Number of employees paid by: a. Monthly salary .....Persons b. Permanent daily .....Persons c. Piece worker .....Persons d. Casual daily .....Persons
----	---	---

	Please provide a financial outline for your enterprise	Fiscal 1992 (1,000 Rupiah)	Fiscal 1993 (1,000 Rupiah)
18	Sales	Rp.	Rp.
19	Profit (before taxes)	Rp.	Rp.
20	Total salaries	Rp.	Rp.
21	Total benefit costs (i.e. housing, transportation)	Rp.	Rp.
22	Total assets	Rp.	Rp.

SECTION 2. EMPLOYEE DATA

For questions 23 to 53, look at the descriptions of engineers, technicians, and skilled workers:

ENGINEERS (university graduates with technical engineering degree)	TECHNICIANS (polytechnic graduates D1, D2, D3)	SKILLED WORKERS (SLTA graduates working with machines or computers OR SLTP education + 10 years technical experience)
--	--	---

23	Write the number of employees by their ages: a. 18 - 24 b. 25 - 34 c. 35 - 44 d. 45 - 54 e. 55 +	<u>ENGINEERS</u> Persons Persons Persons Persons Persons	<u>TECHNICIANS</u> Persons Persons Persons Persons Persons	<u>SKILLED WORKERS</u> Persons Persons Persons Persons Persons
	f. TOTAL	..... Persons	..... Persons	..... Persons

24	How many engineers & technicians work in each department? a. Planning/ Design b. Production c. Purchasing d. Marketing e. Other	<u>ENGINEERS</u> Persons Persons Persons Persons Persons	<u>TECHNICIANS</u> Persons Persons Persons Persons Persons
-----------	--	---	---

25	Write the number of employees in each year:	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
	a. April 1, 1994	a. Persons	a. Persons	a. Persons
	b. April 1, 1993	b. Persons	b. Persons	b. Persons
	c. April 1, 1992	c. Persons	c. Persons	c. Persons
	d. April 1, 1991	d. Persons	d. Persons	d. Persons
	e. April 1, 1990	e. Persons	e. Persons	e. Persons

26	Write the average working hours + overtime per week	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
	a. Standard work week	..... Hours/week	..... Hours/week	..... Hours/week
	b. Average overtime	..... Hours/week	..... Hours/week	..... Hours/week

27	Write the working days per year for last 1 year	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		..... Days/Year	..... Days/Year	..... Days/Year

28	<u>New employee after provisional period (fresh graduate)</u> Write monthly average salary per-person (without bonus / benefits)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		Rp.	Rp.	Rp.

29	<u>New employee after provisional period (fresh graduate)</u> Write average monthly bonus/benefits per-person (i.e. pension, housing, transport) (rough estimate)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		Rp.	Rp.	Rp.

30	<u>35 year old employee:</u> Write yearly salary per-person (without bonus / benefits)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		Rp.	Rp.	Rp.

31	<u>35 year old employee:</u> Write average yearly bonus/benefits per-person (i.e. pension, housing, transport) (rough estimate)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		Rp.	Rp.	Rp.

SECTION 3. RECRUITING

		ENGINEERS (university graduates with technical engineering degree)	TECHNICIANS (polytechnic graduates D1, D2, D3)	SKILLED WORKERS (SLTA graduates working with machines or computers OR SLTP education + 10 yrs technical experience)
32	What main method do you use to recruit? (check ONE)	<u>ENGINEERS</u> a. <input type="checkbox"/> Through DEPNAKER b. <input type="checkbox"/> Direct from school c. <input type="checkbox"/> Advertisement d. <input type="checkbox"/> From recruiter agency e. <input type="checkbox"/> From other company f. <input type="checkbox"/> Through contacts g. <input type="checkbox"/> Other	<u>TECHNICIANS</u> a. <input type="checkbox"/> Through DEPNAKER b. <input type="checkbox"/> Direct from school c. <input type="checkbox"/> Advertisement d. <input type="checkbox"/> From recruiter agency e. <input type="checkbox"/> From other company f. <input type="checkbox"/> Through contacts g. <input type="checkbox"/> Other	<u>SKILLED WORKERS</u> a. <input type="checkbox"/> Through DEPNAKER b. <input type="checkbox"/> Advertisement c. <input type="checkbox"/> From recruiter agency d. <input type="checkbox"/> From other company e. <input type="checkbox"/> Through contacts f. <input type="checkbox"/> Other
33	Are new employees properly prepared for work by their education?	<u>ENGINEERS</u> a. <input type="checkbox"/> Very prepared b. <input type="checkbox"/> Mostly prepared c. <input type="checkbox"/> Enough d. <input type="checkbox"/> Not enough e. <input type="checkbox"/> Not prepared	<u>TECHNICIANS</u> a. <input type="checkbox"/> Very prepared b. <input type="checkbox"/> Mostly prepared c. <input type="checkbox"/> Enough d. <input type="checkbox"/> Not enough e. <input type="checkbox"/> Not prepared	<u>SKILLED WORKERS</u> a. <input type="checkbox"/> Very prepared b. <input type="checkbox"/> Mostly prepared c. <input type="checkbox"/> Enough d. <input type="checkbox"/> Not enough e. <input type="checkbox"/> Not prepared
34	What improvement do you most want in fresh graduates? (check ONE)	<u>ENGINEERS</u> a. <input type="checkbox"/> Technical knowledge b. <input type="checkbox"/> Practical knowledge c. <input type="checkbox"/> Diligence d. <input type="checkbox"/> Initiative e. <input type="checkbox"/> Need no improvement f. <input type="checkbox"/> Other (specify)	<u>TECHNICIANS</u> a. <input type="checkbox"/> Technical knowledge b. <input type="checkbox"/> Practical knowledge c. <input type="checkbox"/> Diligence d. <input type="checkbox"/> Initiative e. <input type="checkbox"/> Need no improvement f. <input type="checkbox"/> Other (specify)	<u>SKILLED WORKERS</u> a. <input type="checkbox"/> Technical knowledge b. <input type="checkbox"/> Practical knowledge c. <input type="checkbox"/> Diligence d. <input type="checkbox"/> Initiative e. <input type="checkbox"/> Need no improvement f. <input type="checkbox"/> Other (specify)

35	Is it easy for your enterprise to recruit employees in sufficient quantity? (check ONE)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult	a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult	a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult
		<i>If you answer d. or e. above, check one main reason:</i>		
		<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
	f. <input type="checkbox"/> Few applicants g. <input type="checkbox"/> Low pay h. <input type="checkbox"/> Unpopular job i. <input type="checkbox"/> Few good candidates j. <input type="checkbox"/> Don't know why k. <input type="checkbox"/> Other (specify)	f. <input type="checkbox"/> Few applicants g. <input type="checkbox"/> Low pay h. <input type="checkbox"/> Unpopular job i. <input type="checkbox"/> Few good candidates j. <input type="checkbox"/> Don't know why k. <input type="checkbox"/> Other (specify)	f. <input type="checkbox"/> Few applicants g. <input type="checkbox"/> Low pay h. <input type="checkbox"/> Unpopular job i. <input type="checkbox"/> Few good candidates j. <input type="checkbox"/> Don't know why k. <input type="checkbox"/> Other (specify)	

36	Is it easy for your enterprise to recruit employees in sufficient quality? (check ONE)	<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
		a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult	a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult	a. <input type="checkbox"/> Very easy b. <input type="checkbox"/> Easy c. <input type="checkbox"/> Not difficult d. <input type="checkbox"/> Difficult e. <input type="checkbox"/> Very difficult
		<i>If you answer d. or e. above, check one main reason:</i>		
		<u>ENGINEERS</u>	<u>TECHNICIANS</u>	<u>SKILLED WORKERS</u>
	f. <input type="checkbox"/> Low technical ability g. <input type="checkbox"/> Poor general education h. <input type="checkbox"/> Personality problems i. <input type="checkbox"/> Poor work attitude j. <input type="checkbox"/> Other (specify)	f. <input type="checkbox"/> Low technical ability g. <input type="checkbox"/> Poor general education h. <input type="checkbox"/> Personality problems i. <input type="checkbox"/> Poor work attitude j. <input type="checkbox"/> Other (specify)	f. <input type="checkbox"/> Low technical ability g. <input type="checkbox"/> Poor general education h. <input type="checkbox"/> Personality problems i. <input type="checkbox"/> Poor work attitude j. <input type="checkbox"/> Other (specify)	