JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF INDUSTRY
THE KINGDOM OF THAILAND

A STUDY
ON
THE DEVELOPMENT
OF
INDUSTRIAL STATISTICS
IN
THE KINGDOM OF THAILAND

(Phase 2)

Summary

JULY 2000

UNICO INTERNATIONAL CORPORATION

MITSUI KNOWLEDGE INDUSTRY CO., LTD.

TOKYO, JAPAN

ABBREVIATION

AC	Advisory Committee
BOB	Bureau of the Budget
BOI	Board of Investment
BOT	Bank of Thailand
CSS	Computer System Section, IIC, OIE
DIW	Department of Industrial Works, Ministry of Industry
DS	Dissemination Section, IIC, OIE
FAQs	Frequently Asked Questions
FTI	Federation of Thai Industries
FY	Fiscal Year
GDP	Gross Domestic Products
IDSS	Industrial Data Systems Section, IIC, OIE
IFCT	Industrial Finance Company of Thailand
IIC	Industrial Information Center, Office of Industrial Economics, Ministry of Industry
IIS	Industrial Index Section, IIC, OIE
ISIC	International Standard Industrial Classification
JICA	Japan International Cooperation Agency
MOC	Ministry of Commerce
MOF	Ministry of Finance
MOI	Ministry of Industry
MITI	Ministry of International Trade and Industry
MPI	Manufacturing Production Index
NESDB	National Economic and Social Development Board
NSO	National Statistics Office
OIE	Office of Industrial Economics, Ministry of Industry
TSIC	Thailand Standard Industrial Classification
WB	World Bank, International Bank for Reconstruction and Development
WG	Working Group

Table of Contents

Page

Chapter 1 Improvement Plan for Current Survey of Production

This chapter explains the steps taken to expand the coverage of target industries and establishments, and recommendations to improve the current survey of production to speedily disseminate the reliable statistics and indices. Improvements on budget/legal/organizational aspects are also recommended for sustainable implementation of the monthly survey.

1.1 Expansion of Target Industries and Establishments

1.1.1 Expansion Procedures

The Current Survey of Production, which started in January 1999 is at the 2nd stage expanded according to the Table 1.1.1.

Table 1.1.1 Three Stages for the Current Survey of Production

Stages	Establishments/sectors/coverage	Start of the survey
1st stage	- 377 establishments - The core 10 industries - Coverage = 30%	*January 1999*
2nd stage	- 1,266 establishments - 34 industries - Coverage = 70%	*November 1999*
3rd stage	- 2,200 establishments - 63 industries - Coverage = over 80%	*Not yet started*

It is a heavy burden for the IDSS staff that the number of sectors and establishments is increased every month. It is appropriate to expand it according to the three stages showed in the Table 1.1.1.

At the 1st stage, IIC has kept a relatively high response rate of 90%. This was achieved by the IIC's efforts to employ enumerators for the initial three months, who explain the purpose and filling methods of the questionnaire to the surveyed establishments and ask them to return it promptly. The response rate is successively high, though the enumerator method was replaced with the mail survey afterwards.

At the 2nd stage, the response rate was less than 30%. This result can be explained by the use of the mail survey without any enumerators and explanation to the respondents. For the time being, to improve the response rate to about 80% by using enumerators is the first priority. At the same time it is necessary for the IIC to increase examination staff in IDSS.

The IIC has not entered the 3rd stage. The 3rd stage should start after the confirmation of high response rate in the 2nd stage, while a sufficient budget and skilled staff are secured.

1.1.2 Selection of Industries to be Surveyed

(1) Industrial Census in 1997 by NSO
(2) Major export items in trade statistics
(3) List of candidate sectors and commodities prepared by the ad-hoc working group
(4) List of product items included in the IIC's production index on the basis of its previous quarterly surveys
(5) Comparison with 13 industries subject to structural adjustment (Table 1.1.2)

Table 1.1.2 13 industries subject to structural adjustment

- Food
- Weaving and clothing
- Shoe and leather
- Wood products and furniture
- Medicine and chemical
- Rubber latex and rubber products
- Plastic products
- Ceramic and glass
- Electric appliance and electronic
- Motor vehicles and spares
- Gem and decoration
- Iron and steel
- Petrochemical

Source : MOI

Based on the above procedures and criteria, the study team selected and proposed candidate industries for expanded coverage. Then, under the agreement with the Thai counterpart, 34 industries were selected for the 2nd stage. These 34 industries cover around 70% of GDP.

1.1.3 Questionnaire and Survey Items

(1) Questionnaire

The questionnaire consists of a single A4-sized sheet, including questions customized to each industry group (by ISIC four-digit code). If a large number of product items are to be surveyed under the same industry code, separate questionnaire sheets were prepared. The questionnaire was printed in Thai on the front side and English on the rear side, because of some respondents (managers) were foreigners (Table 1.1.3).

A product item (or group) was printed on each questionnaire, and survey items were roughly classified into five sections. Regardless of industry, survey items were organized as follows:

1) Establishment
   a. The name and address of the establishment
   b. Industry group
2) Commodities (Quantity)
   c. Specification of commodity
   d. Production by commodity
   e. Shipment by commodity (internal, domestic, export)
   f. Inventory by commodity
   g. Production capacity by commodity
3) Commodity (value)
   h. Sales by commodity
   i. Orders by commodity
   j. Sales Plan by commodity
4) Labor
   k. The number of employees
   l. Average working hours (per person per day)
   m. Average working days (per person per month)

5) Materials

n. Inventory of major raw materials

6) Business survey

o. Business conditions and expectations (current and ensuing months)

57 questionnaire sheets were prepared for 34 industry groups at the 2nd stage.

(2) Commodities to be surveyed

Some product items were specifically identified for each of the industry groups selected for the survey. Final selection of commodity groups was made by using some statistics covering specific industries and hearing from the OIE's Industrial Economics Study Division 2, responsible for industry-specific policy, research institutes such as Thailand Textile Institute and private sector.

"Other" item was provided at the end of the item list to check any omission of staple items in a particular industry group. In total, 485 commodities in 63 Questionnaires were selected from the 34 sectors (excluding "other" item).

1.1.4 Number of Establishments Surveyed

The DIW data covered approximately 120,000 establishments throughout the country. The study team, in cooperation with the IDSS, selected 1,242 establishments for the expanded survey from the DIW's factory registration data, which were used as the population frame.

First, selection of the establishments was initiated by extracting all establishments in the industry sector subject to the expanded survey from the database.

Second, the establishments were listed in order of employment size, and largest establishments, which cumulatively employed 60% of the industry's total, were selected for survey. In the absence of the data on commodity-wise production value and quantities, employment data was taken as alternative for approximation.

★

Ministry of Industry (MOI) / Current Survey of Production

Questionnaire on Processing and Preserving of Fish and Fish Products

OIE(06)-F-01-001

Collected by enumerators from MOI by the 10th day of the next month.

- Plant Registration No. :
- ISIC code : 1 5 1 2
- Questionnaire No : 1 5 1 2 - 1 0
- For the Month of ☐ Year ☐
- Name of Establishment :
- Address :
- Name of Respondent :
- (TEL)
- (FAX)

1. Finished goods (in Quantity)

Survey commodities		Code	Unit	Inventory at the beginning of the month	Production *1	Receipts *2	Shipment: Domestic Sales	Shipment: Export	Shipment: Others *3	Inventory at the end of the month	Monthly capacity *4
				A	B	C	D	E	F	G	H
Canned fish	Tuna	101	ton								
	Sardine	102	ton								
Other main canned seafood	Prawn	103	ton								
	Crab	104	ton								
	Baby clam	105	ton								
	Squid	106	ton								
Other main products (Please specify)		---									

Total of the factory		---	---								

2. Finished goods (in value)

Code	Unit	Shipment: Total	Sales order: This month *5	Sales order: Previous month *6	Sales plan: Next month *7
		A	B	C	D
201	1,000 Baht				
202	1,000 Baht				
203	1,000 Baht				
204	1,000 Baht				
205	1,000 Baht				
206	1,000 Baht				
---	1,000 Baht				
---	1,000 Baht				
---	1,000 Baht				
999	1,000 Baht				

3. Labor

Item	Code	Unit	Total in the factory	For the survey commodities
			A	B
Number of workers	301	persons		
Average working hours (per day per worker)	302	hours		
Average working days (per month per worker)	303	days		

4. Raw materials *8

Materials	Code	Month-end inventory: Quantity	Unit	Value	Unit
Tuna	401		ton		1,000 Baht
Sardine	402		ton		1,000 Baht
Prawn and shrimp	403		ton		1,000 Baht
Crab	404		ton		1,000 Baht
Baby clam	405		ton		1,000 Baht
Squid	406		ton		1,000 Baht
Others (please specify)	---				

	---				

5. Your perception of business conditions in the market

Please mark the corresponding answer.

	1) Very good,	2) Somewhat good,	3) Stable,	4) Somewhat bad,	5) Bad
- This Month :	☐	☐	☐	☐	☐
- Next month *7 :	☐	☐	☐	☐	☐

*1 "Production" includes only products manufactured in Thailand. In case your factory temporarily stops producing a commodity, pleasefill in the column of Production with "0" and report on the column of the Shipment, Inventory, Receipts and Capcity of the commodity.

*2 "Receipts" includes the products purchased from other enterprises, received from other factories of your enterprise, your enterprise, eceived from consignees (including subcontrators) on consignment, etc.

*3 "Others" includes the products shipped to other factories of your enterprise, used in your factory,etc.

*4 "Capacity"eans the maximum production level that can be obtained with existing equipment, using a normal employee working schedule.

*5 "This month means the month to be surveyed.

*6 "Previous months" means sales orders of the previous months that have not been shipped yet.

*7 "Next month" means the following month of the survey month.

*8 "Raw materials" includes goods that are work-in-process (WIP).

All information or data in this Questionaire will be kept strictly confidential.

< Remarks >

[Contact address] Industrial Information Center, Office of Industrial Economics, MOI, Rama VI Road, Bangkok 10400, Tel : (02) 202-4347-60, Fax : (02) 202-4346, 4356

★

การสำรวจข้อมูลการผลิต โดยกระทรวงอุตสาหกรรม
แบบสอบถามสำหรับการแปรรูปและการเก็บถนอมสัตว์น้ำ และผลิตภัณฑ์จากสัตว์น้ำ

OIE(06)-F-01-001

ส่งให้ศูนย์ข้อมูลอุตสาหกรรม ภายในวันที่ 10 ของเดือนหน้า

- ทะเบียนโรงงาน :
- ISIC code : 1 5 1 2
- เลขที่แบบสอบถาม : 1 5 1 2 - 1 0

• สำหรับเดือน ____ พ.ศ. ____
• ชื่อโรงงาน : ____
• ที่อยู่ : ____

• ชื่อผู้กรอก : ____
(โทร) ____
(โทรสาร) ____

1. สินค้า (จำนวน)

สินค้าที่สำรวจ		รหัส	หน่วย	สินค้าคงคลัง ณ ต้นเดือน A	การผลิต *1 B	สินค้ารับมา *2 C	การจำหน่าย: ในประเทศ D	การจำหน่าย: ส่งออก E	การจำหน่าย: อื่น ๆ *3 F	สินค้าคงคลัง ณ สิ้นเดือน G	กำลังการผลิตต่อเดือน *4 H
ปลาประป๋อง	ปลาทูน่า (Tuna)	101	ตัน								
	ปลาซาร์ดีน (Sardine)	102	ตัน								
อาหารทะเลกระป๋องอื่น ๆ	กุ้ง ยกเว้นกุ้งมังกร (Prawn and shrimp)	103	ตัน								
	ปู (Crab)	104	ตัน								
	หอยลาย (Baby clam)	105	ตัน								
	ปลาหมึกกล้วย (Squid)	106	ตัน								
สินค้าหลักอื่น ๆ (โปรดระบุ)		---									

ตัวเลขรวมทั้งโรงงาน		---	---								

2. สินค้าสำเร็จรูป (มูลค่า)

รหัส	หน่วย	การจำหน่าย: รวม A	ยอดสั่งซื้อ: เดือนนี้ *5 B	ยอดสั่งซื้อ: เดือนก่อน ๆ *6 C	แผนการจำหน่าย: เดือนหน้า *7 D
201	พันบาท				
202	พันบาท				
203	พันบาท				
204	พันบาท				
205	พันบาท				
206	พันบาท				
---	พันบาท				
---	พันบาท				
---	พันบาท				
999	พันบาท				

3. แรงงาน

รายการ	รหัส	หน่วย	ตัวเลขรวมทั้งโรงงาน A	สำหรับการผลิตสินค้าที่สำรวจ B
จำนวนคนงาน	301	คน		
จำนวนชั่วโมงทำงานโดยเฉลี่ย (ต่อวัน ต่อคน)	302	ชั่วโมง		
จำนวนวันทำงานโดยเฉลี่ย (ต่อเดือน ต่อคน)	303	วัน		

4. วัตถุดิบ *8

วัตถุดิบ	รหัส	วัตถุดิบคงคลัง ณ สิ้นเดือน: จำนวน	หน่วย	มูลค่า	หน่วย
ปลาทูน่า (Tuna)	401		ตัน		พันบาท
ปลาซาร์ดีน (Sardine)	402		ตัน		พันบาท
กุ้ง ยกเว้นกุ้งมังกร	403		ตัน		พันบาท
ปู (Crab)	404		ตัน		พันบาท
หอยลาย (Baby clam)	405		ตัน		พันบาท
ปลาหมึกกล้วย (Squid)	406		ตัน		พันบาท
อื่น ๆ (โปรดระบุ)			---		

			---		

5. ความเห็นต่อภาวะธุรกิจ

กรุณาทำเครื่องหมาย ✓ ใน ☐

	(1) ดีมาก	(2) ดีเล็กน้อย	(3) ทรงตัว	(4) แย่เล็กน้อย	(5) แย่มาก
- เดือนนี้ :	☐	☐	☐	☐	☐
- เดือนหน้า *7:	☐	☐	☐	☐	☐

*1 "การผลิต" รวมถึงสินค้าที่ผลิตในประเทศไทยเท่านั้น กรณีโรงงานของท่านหยุดการผลิตสินค้านั้นชั่วคราวกรุณาเติมเลข "0" ในช่องการผลิตและเติมตัวเลขอื่น ๆ ในช่องการจำหน่าย สินค้าคงคลัง สินค้ารับมา และกำลังการผลิต

*2 "สินค้ารับมา" รวมถึงสินค้าที่ซื้อจากบริษัทอื่นได้รับจากโรงงานอื่นในบริษัทเดียวกับท่าน สินค้าฝากขาย (รวมทั้งจากการจ้างผู้รับเหมาผลิต) ฯลฯ

*3 "อื่น ๆ" รวมถึงสินค้าซึ่งส่งไปยังโรงงานอื่นในบริษัทเดียวกับท่าน สินค้าใช้เองในโรงงาน ฯลฯ

*4 "กำลังการผลิต" หมายถึง ขีดความสามารถสูงสุดของขบวนการผลิต (ไม่ใช่แรงม้า)

*5 "เดือนนี้" หมายถึงเดือนที่ถูกสำรวจ

*6 "เดือนก่อน ๆ" หมายถึง ยอดสั่งซื้อที่ยังไม่ได้ส่งมอบของเดือนก่อน ๆ

*7 "เดือนหน้า" หมายถึง เดือนถัดจากเดือนที่สำรวจ

*8 "วัตถุดิบ" หมายความรวมถึง สินค้าที่อยู่ระหว่างการผลิต (work - in - process) ด้วย

ข้อความหรือตัวเลขที่กรอกแบบสอบถาม ทางราชการจะถือเป็นความลับโดยเคร่งครัด

< หมายเหตุ >

[สถานที่ติดต่อ] ศูนย์ข้อมูลอุตสาหกรรม สำนักงานเศรษฐกิจอุตสาหกรรม กระทรวงอุตสาหกรรม ถนนพระรามที่ 6 กรุงเทพฯ 10400, โทร. (02) 202-4347-60 โทรสาร (02) 202-4346, 4356

S - 6

1.1.5 Survey Areas

The 1st stage was supposed to cover Bangkok and its vicinities.

At the 2nd stage, surveyed establishments were selected from all over Thailand. Geographic distribution of selected establishments is shown (Table 1.1.4)

1.1.6 Distribution and Collection of Questionnaire

The monthly survey should proceed with the following schedule. The questionnaires are distributed in the middle of each month to request data on the current month, followed by collection starting at the beginning of the subsequent month. Collection should complete by the middle of the month. Enumerators should start to remind respondents who have not sent the questionnaire on around 10th.

1.1.7 Recommendations

(1) Expansion of Target Industries and Establishments

a) To enter into an agreement with a local consultant to hire and train enumerators for visiting of the surveyed establishments for explanation, expediting and collection of the questionnaire. At the same time, the IDSS staff should be increased up to 34.

b) To keep the core establishments to ensure the minimum requirement for the continuous dissemination of the result of the current survey and concentrate on the preparatory work such as enumerator training, the visiting of establishments, and secure sufficient IDSS staffing (additional 21) with adequate budgetary backup. The IIC should start the survey expansion after securing sufficient manpower and budget. If the IIC start expansion without them, it will lead to waste of time and efforts.

c) When the IIC moves to the 3rd stage covering 63 industries with 2,200 establishments in the future, it needs 53 staff for the IDSS (including temporary workers) about four times the current strength, a sufficient budget for enumerators and careful preparation.

(2) Utilization of Provincial Offices

Table 1.1.4 Regional Distribution of Target Establishments by Sector in the 2nd Stage

Sectors		Bangkok & Vicinity	Central	North	Northeast	South	Total
1512	Canned fish	56	4	0	0	23	83
1513	Canned veg/fruits	4	11	5	2	1	23
1514	Vegetable oil	11	4	0	0	7	22
1533	Animal feed	13	14	2	2	5	36
1542	Sugar	3	16	6	9	0	34
1551	Alcoholic drinks	3	2	1	4	0	10
1553	Beer	6	2	0	0	0	8
1554	Soft drinks	6	1	1	2	0	10
1600	Tobacco	2	0	0	0	0	2
1711	Spinning/weaving	67	0	0	0	0	67
1810	Apparel	147	7	9	3	0	166
1911	Tanned leather	2	1	0	0	0	3
1920	Leather shoes	9	22	0	1	0	32
2101	Pulp & paper	7	9	1	1	0	18
2320	Refinery	1	3	1	0	1	6
2411	Basic chemicals	16	23	0	1	0	40
2424	Soap/detergent	8	0	0	0	0	8
2511	Tyre/tube	8	1	0	0	0	9
2519	Rubber products	12	11	0	2	12	37
2520	Plastic products	13	2	0	2	0	17
2694	Cement	0	11	4	0	2	17
2695	Concrete products	25	13	2	3	5	48
2710	Steel products	45	30	0	3	1	79
2899	Metal products	74	14	2	2	0	92
2919	Air conditioner	5	5	0	0	0	10
3000	Computer	5	5	0	0	0	10
3120	El. components	24	14	0	0	0	38
3210	Electric tube/ic	67	14	1	1	0	83
3230	Radio/tv	17	2	0	0	0	19
3320	Glasses/lens	9	1	0	0	0	10
3410	Auto	47	31	3	6	4	91
3430	Auto parts	55	19	1	1	0	76
3591-2	Motorcycles/bicycles	25	5	0	3	0	33
3610	Furniture	12	9	4	1	3	29
Total		804	306	43	49	64	1266

(3) Maintenance and Updating of Population and Manuals

a) To keep record and accumulate inquiries and problems on a daily basis.
b) To reflect the above data and visit record on factories periodically to update and improve the execution system.
c) To devise a system so that IDSS will be informed of any change of the DIW list.

(4) Minister's Commendation for Cooperative Establishments

JICA and MOI held a Seminar for Industrial Statistics in Bangkok on June 21, 2000. The MOI minister celebrated the cooperative establishments by minister's commendation for the first time. As such event is effective in securing the higher response rate, the IIC should hold it every year as an official event. The location for such ceremony should preferably be selected in a different region each year.

(5) Communication Channel with Statistics Organizations of other Countries for Exchange of Information and Consultation/Advice

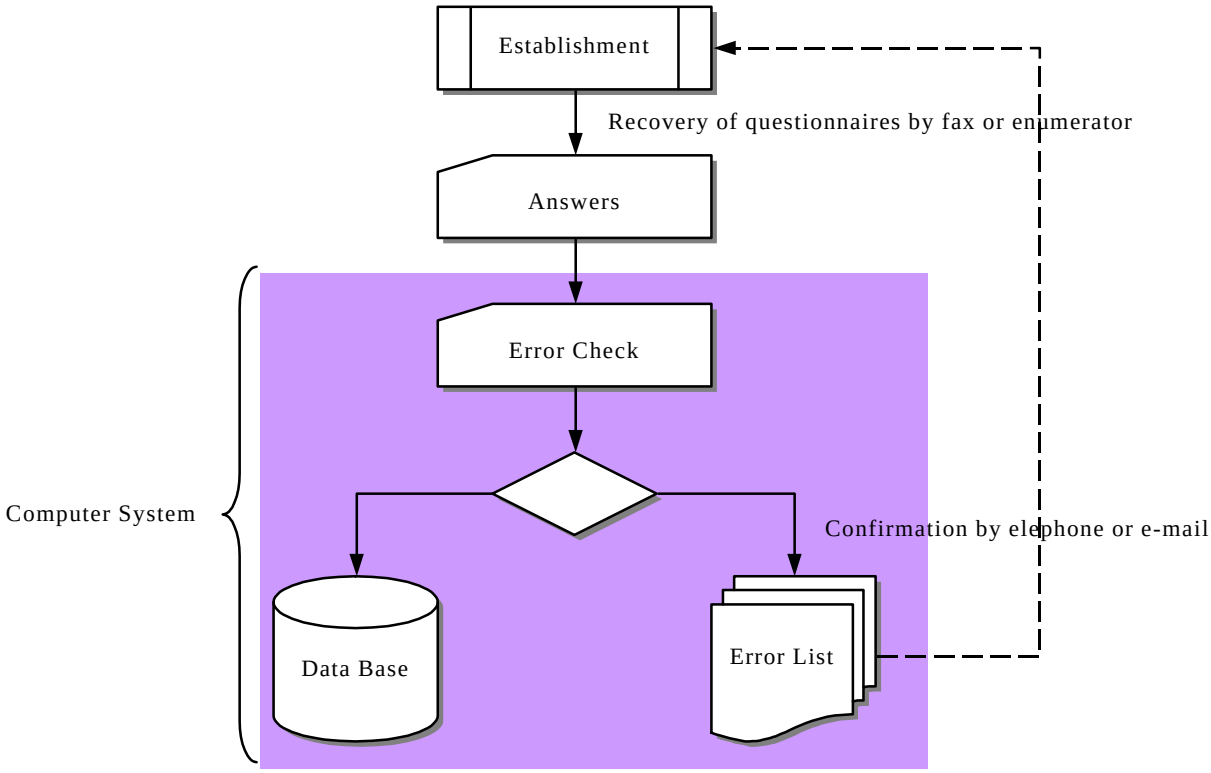
Exchange of information with organizations of other countries and joining international organizations (for instance, AEM-MITI Economic and Industrial Cooperation Committee, Working Group on Statistics) on statistics would help gaining information on experiences of other nations. It will help solve a variety of problems, which may arise in the future at the IDSS and the IIS in conducting works and improve the overall performance of the statistical management system as a whole.

1.2 Examination and Analysis

1.2.1 Examination

The returned questionnaires are checked by examiners with an aid of a computer system. Each examiner is expected to be familiar with factories he is responsible for. Experienced staff can examine the responses very quickly by their eyes, and the computer system streamlines the examination process if used properly. In particular, the computer system can be a powerful tool to check entries, data accuracy, anomalies, and balance. If the IIC staff find some errors, they should contact the establishment by telephone or e-mail for clarification (Chart 1.2.1).

Chart 1.2.1 Examination Flow



Note: Shaded area shows the examination process.

1.2.2 Implementation of Analytical Work

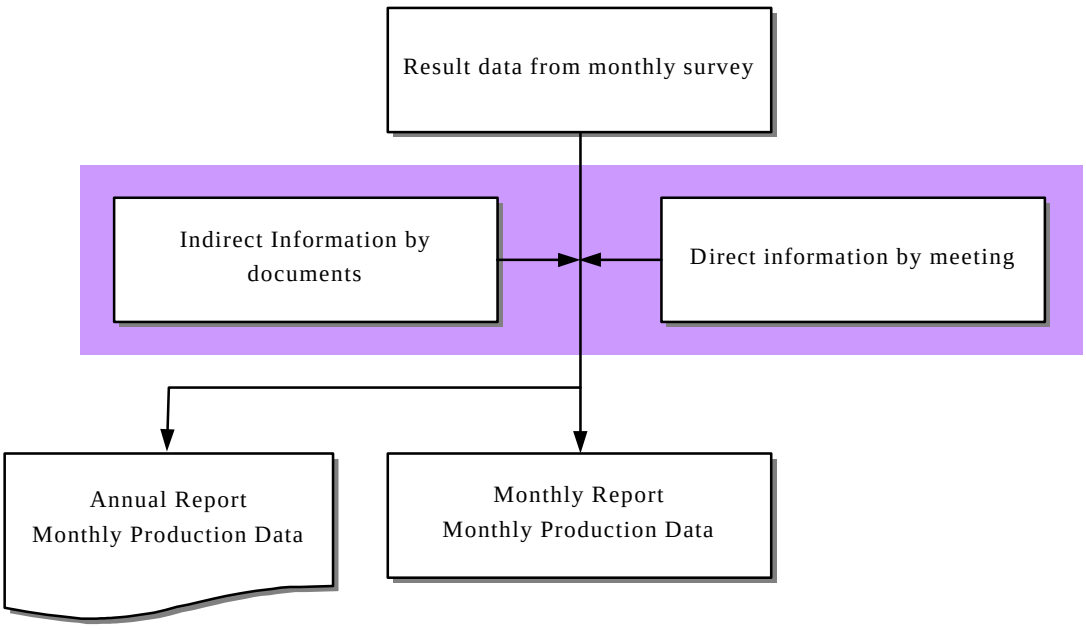
1.2.2.1 Statistics Analysis

There are two kinds of preparations for analytical work to ensure accurate statistics (Chart 1.2.2). The first type of preparation is to collect information on industries

(target companies, commodities, competitive commodities, investment, finance etc.) from publications all the time. Trade information can be collected through general media, such as magazines and news papers. Many business magazines can be used as useful sources. It is recommended that the IIC subscribe some magazines. The IIC has already started clipping articles on related commodities and industries from four papers (Bangkok Post, Bangkok Business, Thansettakit and Maatichon). These daily and monthly news are helpful to understand or evaluate the current or new trends. Quarterly GDP, wholesale prices and foreign trade statistics are the most important information to check the production indices every month.

Secondly, field information can be collected from producers or economists, and discussing with these people sharpens sensitivity to actual industrial activities. Analysts need to visit factories with the examiners and exchange opinions with factory managers. The IIC staff should ask them the factors of production, shipment or inventory changes of survey items. These meetings should be held several times a month. Also they need to have regular meetings with trade organizations and industrial groups under the Federation of Thai Industries (FTI). The IIC should report the survey results while private businesses should report the business problems and prospect of solving as a sector. At the same time, close communication should be maintained with the members of the current Working Group, such as BOI and BOT.

Chart 1.2.2 Flow-chart of Analysis



Note: Shaded area shows the analytical works.

1.2.2.2 Others

When data obtained from the monthly survey are accumulated for a full year, monthly disseminated results will be revised by reflecting additional data which were reported to the IIC after the deadline for submission, and the annual report will be compiled once a year. A major change in the methodology such as change of commodities, expansion of sectors, renewal of questionnaire form etc. should preferably be done every five years or ten years according to compilation of I/O tables for the base of index weighing or execution of industrial census for sectoral population frame. Small changes, such as a change in surveyed establishments in the same sector, may be effected on an annual basis. Analysts have to compare these results with annual GDP, Labour Statistics etc., and assure the accountability for the IIC's statistics.

Monthly Statistics need to be disseminated punctually on a periodical basis. Analysts are only requested to confirm data accuracy, i.e., statistics analysis. Analysis of business trends or macro-economy together with other economic statistics should be handled by other divisions. The IIC should limit their responsibility to the implementation and dissemination of current survey of production and its indices.

1.3 Dissemination and Utilization of the Absolute Figures

1.3.1 Importance of Dissemination of the Absolute Figures

Through the Current Survey of Production, the IIC collects the actual figures of production, shipment, inventory, etc. for each of selected commodities. These totaled figures for each commodity are called “absolute figure”, as distinguished from the “index”. The index shows the “direction (trend)” of production, shipment and inventory, while the absolute figure indicates the “level” of them.

Importance of dissemination of the absolute figures is summarized as follows.

a) Restoring of industrial information to establishments

By restoring the total figures of production, shipment, inventory, and so on to a cooperative establishment for the Current Survey of Production, it can be useful for the establishment to know its share in the market.

b) Improvement of statistical accuracy

In many cases, data on production, shipment, and so on for individual commodity are also collected by business groups composing a number of manufacturers. If the absolute figures are disseminated, they will be necessarily compared with the data surveyed by the business groups to allow the accuracy of the absolute figures to be examined.

c) Utilization of the absolute figures

As the absolute figures indicate the level of production, shipment, inventory and so on, statistical users can grasp the market scale of each commodity, the quantity of inventory secured for shipment, the actual situation of production capacity, etc. from disseminated absolute figures.

1.3.2 Problems against Dissemination of the Absolute Figures

Towards dissemination of the absolute figures, it is imperative to achieve enough “coverage” of each selected commodity in order to assure the statistical reliability.

However, as explained below, the information for the determination is lacking in Thailand, and therefore, the IIC is refraining from disseminating the absolute figures at present.

a) Lack of information on major products (commodity)

Originally, in Thailand, there is lack of the information on what kind of major commodities are actually produced.

b) Lack of information on establishments producing the major commodities

In Thailand, even though a major product (commodity) can be found, there is not sufficient information on establishments that are producing the commodity.

1.3.3 Requirements for Dissemination of the Absolute Figures

The following requirements should be settled in order to achieve the sufficient coverage for each commodity as the prerequisite to the dissemination of the absolute figures.

a) Completion of the establishment list by commodity

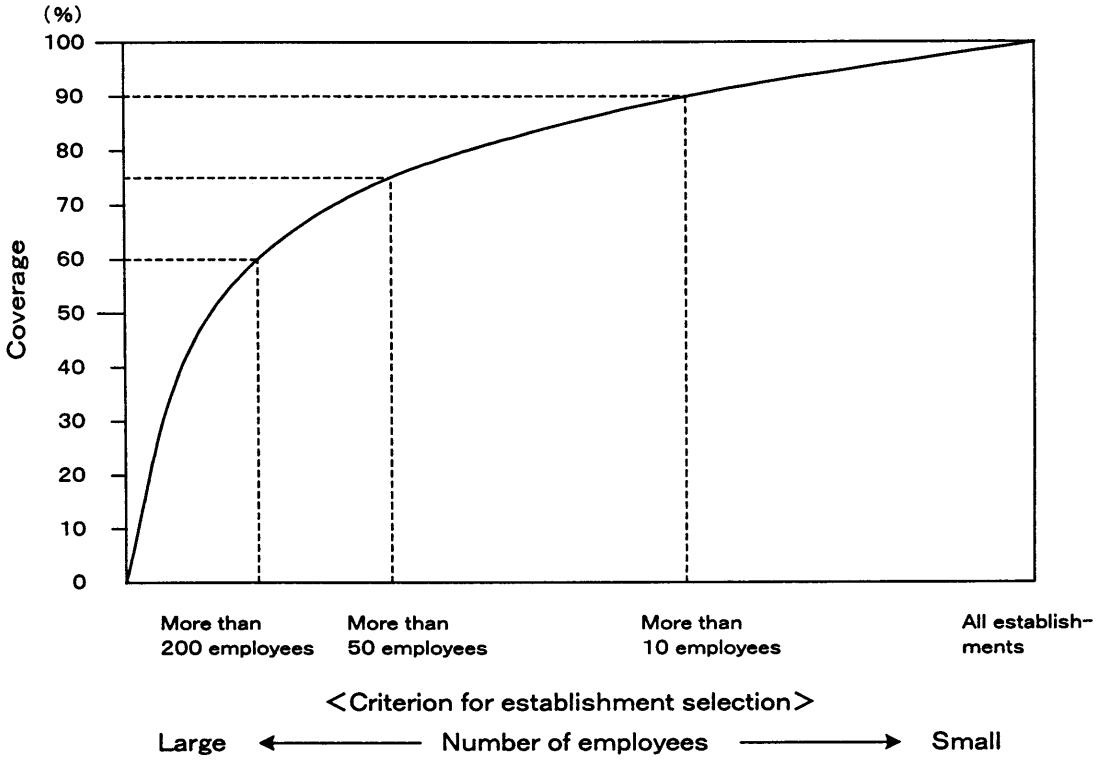
The IIC should arrange the institutional collaboration between relative statistical organizations including the NSO that is responsible for the annual Industrial Survey and the Industrial Census. Once the required information has been obtained, the IIC must complete the establishment list by commodity.

b) Setting criteria for the establishment selection

For a commodity in a relatively oligopolistic market, i.e., produced by a small number of large establishments, all establishments should be surveyed as far as possible.

On the other hand, for a commodity produced by a large number of small and medium-sized establishments, selection should be made according to a fixed criterion, say “more than 20 employees.” In this case, the ratio of total production value (or total employees) of the selected establishments to the grand total production value (or grand total employees) of the commodity, which represent the survey coverage, should be over 70% to secure the statistical reliability. Based on the example in Figure 1.3.1, the coverage for the commodity A is around 75% with the criterion of “more than 50 employees”, while it decreases to 60% with “more than 200 employees”. Accordingly, the criterion for the commodity A had better be “more than 50 employees”.

Figure 1.3.1 Criterion for Establishment Selection and Coverage



Not only accuracy of the absolute figures but also that of the Industrial Indices can be improved through the dissemination of absolute figures, as the indices are compiled from the absolute figures. Therefore, the IIC should proceed steadily with preparation for the dissemination of absolute figures in order to make the evaluation on the IIC's industrial statistics higher as a whole.

1.3.4 Treatment of the Other Industrial Information

The IIC obtains the following useful information other than the absolute figures and the Industrial Indices which is related to the industrial activities in Thailand.

a) Sales plan for this year and the next month

This question has been included in the questionnaire according to the request from the National Accounts Division of the NESDB. It is designed to be used for examination of the short-term business cycle by comparing the plans reported by the manufacturers with the actual figures.

b) Perception of business condition

This question has been put in the questionnaire according to the request from the Economic Research Department of the BOT. It will be used to understand what manufacturers feel about the current business condition in each market, one of standard questions asked in this type of business survey.

As for the industrial information above, they should be respectively reported every month to the NESDB or the BOT and evaluated whether they can be utilized for administrative policies, first of all. Then, if they prove to be suitable for public dissemination and useful for users, the method and channel of dissemination should be considered by the IIC, the NESDB and the BOT.

1.4 Institutional Building-up

1.4.1 Budget

(1) Regular Budget for IIC

The Government of Thailand is in the process of budget balance improvement. The ordinary budget for administration has been reduced by approximately 10 percent a year. There was no budget for any undertakings up to FY1999.

The IIC changed this trend by requesting the monthly survey project in the FY2000 budget in order to monitor current industry trends. MOI requested 30 million baht for this new project. BOB finally allocated 3.2 million baht for computer equipment with standard software and 13 million baht for statistical execution work to be contracted outside. The IIC's budget increased 2.4 times owing to this new project, while other administrative budgets were cut as usual (Table 1.4.1). The IIC can renew office equipment and use 100 enumerators. The IIC can enlarge the size of the monthly statistics from current 377 establishments to 1,266 ones covering 34 industries and 57 commodity groups for the near future target.

Official statistics work should be done by the government itself in order to achieve a higher response rate by legal enforcement and providing strict security and to be sustained against changes of economic conditions. If the IIC commissions the survey to a company on a contract basis, the IIC will not be able to succeed in internal human resource development and to gain expertise in the statistics production process. The government can hire enumerators from outside as a part of execution, but the management and instructions on survey methodology should be the direct responsibility of the government itself. Target establishments for the survey do not believe in the objective of this survey in the long run due to information leakage, even if it is more efficient in the short run. If the IIC continues to depend on the consultant firm forever, the response rate can decrease with a risk in relation to security. In conclusion, budget for outsourcing for the current survey of production should be limited to enumerators for execution, temporary staff for examination and computer system maintenance & training.

Table 1.4.1 IIC's Budget

as of February 2000, unit : baht

	Fiscal year 1999	Fiscal year 2000	Fiscal year 2001 (request)
1. Salary and regular wage for permanent staff	**5,405,600**	**5,738,900**	**6,343,900**
1.1 Salary	**5,327,600**	**5,655,900**	**6,256,800**
33 positions	5,217,900	5,546,700	6,147,600
Special allowance for the positions	109,200	109,200	109,200
1.2 Regular wage for permanent staff	**78,500**	**83,000**	**87,100**
1 position	74,000	79,100	83,000
Additional allowance	4,500	3,900	4,100
2. Compensation, miscellaneous, and material	**6,385,800**	**6,017,700**	**9,732,500**
2.1 Compensation	**292,800**	**279,500**	**265,500**
2.1.1 Meal charge for overtime work	27,000	25,700	24,400
2.1.2 House rental	25,800	25,800	24,500
2.1.3 Compensation for the personnel	240,000	228,000	216,600
2.2 Miscellaneous	**5,348,000**	**5,078,200**	**8,840,000**
2.2.1 Allowance for home rent, and transportation charge	148,000	133,200	126,500
2.2.2 Maintenance for the equipment	100,000	100,000	95,000
2.2.3 Subcontract for service fee	5,100,000	4,845,000	8,618,500
2.3 Materials	**745,000**	**660,000**	**627,000**
2.3.1 Office supplies	400,000	380,000	361,000
2.3.2 Book, magazine and textbook	20,000	20,000	19,000
2.3.3 Computer materials	325,000	260,000	247,000
3. Durable materials, land, and building cost		**3,289,000**	**2,867,500**
4. Other expense		**13,000,000**	**13,000,000**
Expense for survey			
Total	**11,791,400**	**28,045,600**	**31,943,900**

Source : IIC

(2) Recommendations

The IIC is requesting an increase in ordinary budget for FY2001 to make monthly statistics on a contract basis, computer-related expenditure, salary for increased staff etc. In order to continue the monthly statistics, the IIC should get a necessary budget for the following items. The IIC should consider the fact that the number of surveyed establishments will be increased to 1,266; newly developed software was installed; survey results are disseminated every month and once a year; and the IIC office will move to a new OIE building in the fall of 2000.

a) Employment of enumerators
b) Employment of temporary workers for examination of responses and data input
c) Fee for software maintenance and development for networking in the MOI
d) Procurement of copiers, fax machines, and personal computers (one-fourth or one-fifth of PCs and servers shall be replaced each year)
e) Training expenditures for new employees and computer staff
f) Printing costs and postages for questionnaires, PR activities by monthly reports and the annual report etc.
g) Regional seminar expenditures such as facility use, travel costs and accommodation fees for the IIC staff and other participants.
h) Construction expenditures to install electric cables under the floor for data communication and to install a special door & storage room for safekeeping of returned questionnaires.

In the initial stage, the IIC needs to hire a consulting firm for execution, but in the long run the IIC should request the Planning Division, Office of the Permanent Secretaries, to secure the necessary budget in order to use strategic provincial offices for the execution of monthly statistics. This will also benefit provincial offices as well as OIE to monitor the industrial activities at provincial level.

1.4.2 Legal Framework

(1) Ministerial Decree

The IIC started preparation for the new monthly survey to replace the above quarterly survey since October 1998. In 1999, the IIC drafted a new decree that was favorably reviewed by the lawyer of DIW.

Mr. Suwat Liptaponlop, the Minister of Industry, sent a formal letter to the Secretary of the Cabinet on 1st November 1999 (Document 1.4.4). The draft of the

new decree consists of the following contents with 140 types of questionnaires being attached, out of which 57 questionnaire forms are related to the monthly survey.

a) Abolishment of the current Decree No. 9 of the Factory Act 1992
b) Mandating that type-2 and 3 factories provide monthly questionnaires within 10 days of the following month, and annually questionnaires within 30 days of the next year
c) Returning of questionnaires by registered mail or fax
d) Effective 90 days after announcement in the Gazette

(2) Authority of the Legal Implementation

The enforcement of registration, registration fee payment, report on specified matters, etc. by the Factory Act is the responsibility of MOI. MOI has 480 inspectors in four regional inspection offices to monitor wastewater discharge from registered factories. Registered factories of types 2 and 3 are to pay a renewal fee every five years at the end of the year and to pay a license fee for operation every year at the MOI provincial office. MOI can impose a fine of 20,000 baht on a registered factory for violation of the law.

MOI delegated to OIE in October 1998 the administrative authority in relation to the monthly and annual surveys after the issuance of the new Ministerial Decree. OIE's permanent staff with a grade of level 7 or higher can investigate factories that fail to submit periodical questionnaires, and can fine them as a last resort.

(3) Punishment

The punishment is a last resort to compel uncooperative factories to fill out and submit the questionnaires, but care should be taken to avoid a negative influence on other factories by discouraging them from responding to the survey. NSO as well as Japan's MITI have not resorted to the punishment action and usually persuade the factories to submit the questionnaire. The IIC developed a warning letter as a new tool against rejection. The IIC has, as a test case, succeeded in several recoveries by use of this warning in 1998.

(4) Recommendations

A legal framework is one of the most essential requirements to be met in order to conduct periodical surveys systematically. Private companies tend to be uncooperative because they are afraid that their trade secrets may be disclosed and they often avoid the burden of filling out the questionnaire. But the legal framework,

adopted by Parliament, works equally among enterprises and is intended to serve the public interest. This fair-share principle is essential for the government to obtain cooperation by encouraging respondents to fill out and submit the questionnaire. On the other hand, the IIC should guarantee that every response is strictly kept in secret.

In the 1st stage, the IIC has recorded a good response rate of 80-90% of 265 establishments, which is remarkable compared with other industrial surveys, but has yet to reach a satisfactory level. The IIC has increased the number of the target establishments to 1,266 since November 1999 at the 2nd stage. Unfortunately, the response rate has been very poor as a result of the mail survey and no explanation to the establishments. It will be the most important task for the IIC to improve the response rate. The IIC needs to employ a hundred enumerators, to train them and assign to each establishment. Under the new Ministerial Decree, the IIC's staff are required to send the officials to the non-responding factories and request the cooperation in order to raise the response rate as high as possible in order to maximize reliability of the current survey of production.

The annual survey, which is conducted under the supported of the World Bank, covers many questions and is 18 pages long. Business judgements by managers are main items, being useful regarding the international competitiveness of industries among several Asia countries, focussing on the recovery process of their economies after the financial crises. This form of questionnaire is not appropriate from the interest of obtaining continuous statistics, however. Though the IIC will need to coordinate the annual survey with NSO, it needs to change it into quantitatively expressed items such as volumes and monetary values in the future. This legal procedure is comparatively easier than the new issuance of a Ministerial Decree.

1.4.3 Mobilization of Provincial Offices

(1) MOI's Provincial Office

MOI sets up provincial offices, one in each of 75 prefectures, with about 25 employees in each. The offices are managed by the Planning Division, Office of Permanent Secretaries. These offices are composed of four divisions, Policy & Planning, Industrial Works, Industrial Promotion and Mineral Resources. OIE-related work is handled by the Policy & Planning Division, and the work of the latter three divisions is related to the Department of MOI's headquarters.

There is no legal framework for the duty of provincial offices. The provincial officers work according to the instructions of the Director General of MOI's headquarters or the Permanent Secretary by official letters.

(2) IIC's Approach to the Mobilization of Provincial Offices for Statistical Execution

The Director General of OIE sent a letter to the Permanent Secretary on 10th November 1998 to explain the JICA and World Bank projects and to ask for approval of following measures.

a) Amendment of the Ministerial Decree No. 9 (1995)
b) Support of the provincial offices
c) Punishment of non-responding establishments after the issuance of a warning letter

Mr. Padejpai Meeunaim, Deputy Permanent Secretary, signed the IIC's Operation Plan and agreed to further actions on 21st December 1998 (Document 1.4.6). Mr. Anusorn Nuangpolmak, Deputy Director General of OIE, asked the Planning Division, Office of Permanent Secretaries, by letter on 7th January, 1999 to inform all the provincial offices of the IIC's surveys and operating plans (Document 1.4.7).

Administrative procedures on mobilization of the provincial offices were completed, but the Office of Permanent Secretaries does not secure the necessary budget allocation for provincial offices to implement those works. Fortunately the IIC succeeded in hiring a consultant firm for execution of monthly statistics in FY2000.

(3) Recommendations

For the purpose of statistics execution, the IIC should mobilize the provincial offices to deliver and collect the questionnaires and to examine the answers provisionally, preceding examination by the IIC in the future. The Thai government faces budget restraints and it will be difficult for the IIC to increase its regular budget for monthly statistics in the future. If the Office of the Permanent Secretaries recognized the importance of industrial statistics and succeeded in securing a necessary budget for statistics, this will be less costly than the hiring of a consultant firm and will contribute to higher response rate. This work also will stimulate the activities of provincial offices by availability of industrial information in each prefecture.

The IIC, as provincial offices' future task should try to have a consultant firm station enumerators at provincial offices for execution of monthly statistics as well as

inviting the provincial staff to a regional seminar. This is rather an unusual approach but an important step to involve provincial officers into the monthly statistics in the future.

1.4.4 Staff Training

(1) Staff for Execution, Examination, Tabulation, Analysis and Dissemination

Execution is to manage r delivery and collection of the questionnaire to/from the surveyed establishments, and record the date by sector. Examination involves correction of data and information given in the questionnaire by comparing them with the past data or requesting clarification or additional information to the respondent. Tabulation means data input to a computer system and output of data assorted and tabulated in a specific form. In the past, these three functions were carried out by different sections. Now personnel in charge of each sector can perform them by the aid of the newly developed computer system. Analysis is carried out by staff assigned to a specific sector to verify accuracy of data before dissemination. Staff in charge of dissemination print and distribute the monthly report, and to digitize data for Web publication, and to respond to questions from others. If these functions do not work systematically, monthly statistics will not be available as planned. The staff performing above functions need basic skill for computer operation.

(2) Computer Experts

The IIC staff responsible for operation of the new computer system have already received special training for system maintenance as part of technology transfer efforts, but still lack higher IT skills required for development of OA tools, for special technique on database management. New employees qualified to serve as data processing technician need training to attain certain levels of skill.

(3) Recommendations

On-the-Job-Training (OJT) is the most suitable form of education for the IIC staff to learn necessary skills related to execution, examination, tabulation, analysis and dissemination. They can self learn these skills from job manuals. It is most important to get acquainted with jobs as early as possible. They also need to become familiar with the activities of industries and individual establishments they are responsible for. The NSO provides a variety of training courses including design, population frame management, sampling etc. for statisticians of other ministries.

Industrialized countries and international institutions also provide training courses. The IIC should send their staff to the above courses for upgrading their skills.

Computer experts who have certain levels of skills can master the new system by reading computer manuals. As private companies also offer many kinds of training courses, the IIC should secure a sufficient budget required to send their staff to these courses.

1.4.5 Reorganization of IIC

(1) IIC's data processing capabilities

The IIC has the following resources to handle workloads required for development and management of production statistics.

Survey, examination and data input (IDSS):	13, consisting of 9 full-time staff and 4 part-time employees (other 13 part-time ones ended at the end of March, 2000)
Index development, analysis and publication (IIS):	10 full-time staff (of which 3 are reserved for the World Bank's annual project)

In addition, each of the two sections has a computer expert assigned from the Computer System Section (CSS), while OIE's Division 2 can provide advice and support for the IIC related to the analysis of the indices. The IDSS has its hands full by the workload at the 1st stage and it has not yet examined the expanded portion of the collected questionnaires. The IIC is facing serious problems related to manpower shortage and uneven workloads

As the survey reaches the expansion stage to add new industries gradually, leading to significant growth of the survey population in terms of the numbers of industries, items and establishments, workloads will increase faster than productivity improvement of staff and necessitate additional hiring (Table 1.4.2). Specifically, as the survey population grows from the current 10 industries to 34, as contemplated in the medium term, and to 63 in the long run, the IDSS must nearly four times its staffing from 13 to 53 (assuming that productivity will improve from current 0.7 industries per staff to 0.8 and 1.2 industries). On the other hand, the IIS is expected

to decrease its staffing to around 8 (again assuming that each analytical staff will handle 20 industries for the medium term and 30 industries in the long run from the current one industry per staff, while three will be permanently assigned to other project). The additional staff will be required before the decision on expansion frame of the survey (Table 1.4.2).

Table 1.4.2 Expected Staffing Trend

(Unit: person)

	Jan.2000	Medium term target	Long term target
Number of Industries	10	34	63
IDSS	13	34	53
(productivity)	(0.7)	(1.0)	(1.2)
IIS	10	8*	7**
(productivity)	(1.0)	(5.0)	(10.0)

Note: * 3 (analysis) + 2 (dissemination) + 3 (annual survey)

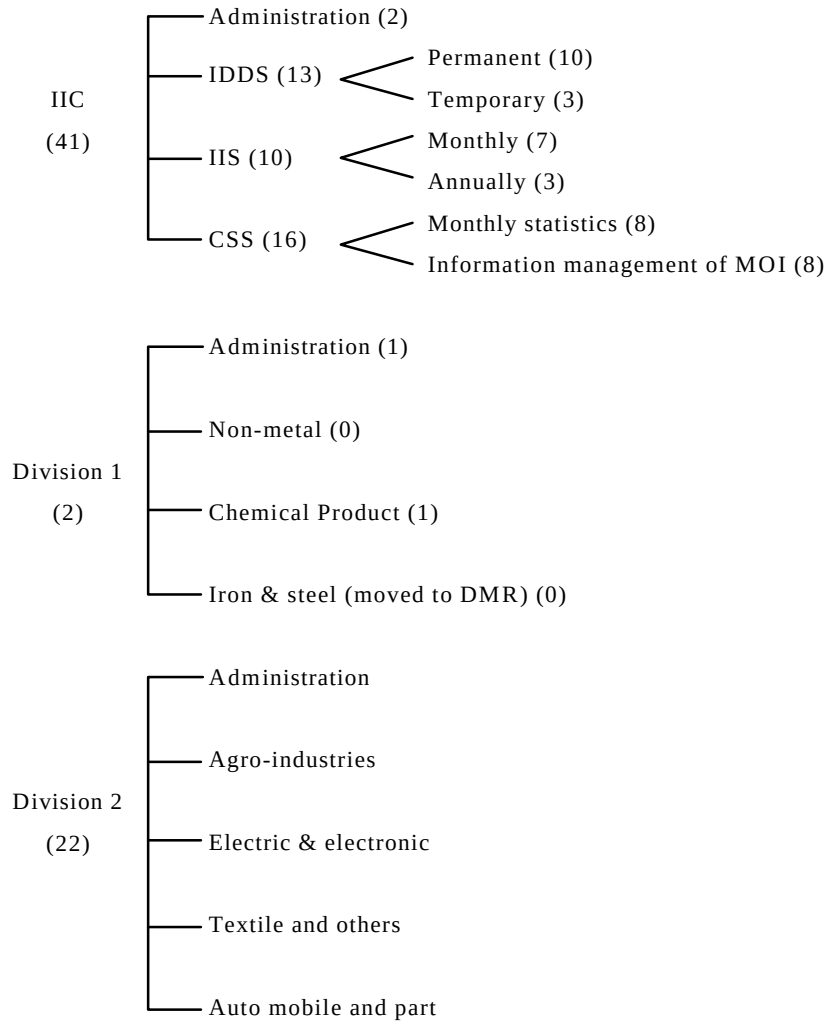
** 2 (analysis) + 2 (dissemination) + 3 (annual survey)

If resource allocation, budgeting or skill improvement is difficult to achieve within a short period of time, it will become inevitable to revise the expansion plan including the surveyed industries and establishments. If the IIC expands the range of survey without securing a required number of skilled and experienced staff and a sufficient budget, it will likely face poor credibility of statistics.

(2) Cooperation Among Related Divisions of OIE

There are three divisions related to industrial survey at OIE, namely the IIC, Divisions 1 and 2 (Chart 1.4.1). The IIC has two functions, production of statistics and information management of the MOI. Division 1 is in charge of sectoral research on basic industry by commodity. Division 2 is responsible for sectoral research on export industry by commodity. Adding to these research works, Division 1 and Division 2 have work on sectoral policy formation. Divisions 1 and 2 can help the IIC's analysis activity, and will be benefited from monthly statistics that allow them to monitor the industries or commodities. There are some duplications of work between the IIC and other two Divisions. If these redundant resources are consolidated for reallocation of resources, industrial monitoring can be carried out more effectively in terms of three routes, that is production of monthly industrial statistics, its dissemination and research/analysis.

Chart 1.4.1 Current Structure of Survey Divisions



Source: MOI. ( ) shows the number of staff.

(3) Recommendations

To an administrative reorganization, job analysis for the IIC at present and in the futures should be done thoroughly and opinions should be exchanged within the organization. Following two principles should be paid attention carefully.

a) Statistics production needs sustainability. A qualified person with sufficient knowledge and experience should be assigned to the right place.

b) Uneven allocation of workload among staff should be averted, as much as possible.

In order to establish an effective institutional framework, the IIC will be reorganized to accompany close cooperation of Divisions 1 and 2 in the analysis field by sector and by commodity in manufacturing. The IIC needs to request the DIW to renew the registration periodically for the population frame of industry for monthly statistics, instead of implementation by itself. The IIC also should seek for cooperation with Division 2, the OIE to implement economic analysis related to industry. The IIC should concentrate on two basic works, i.e., executing the survey surely and disseminating the results promptly. Statistical analysis before dissemination is naturally responsibility of the IIC and the IIC can request the sectoral analysis to Division 2. The IIC can save staff allocation to the population frame and the IIS by securing cooperation as suggested above (Chart 1.4.2).

Chart 1.4.2 IIC's Reorganization Plan

	Staff Allocation for Medium Term	Staff Allocation for Long Term
IIC — Administration	2	2
Design and Population Frame Section	0 *	1
Statistics Section 1 (food, leather and textiles)	13 (13)	16 (19)
Statistics Section 2 (wood, paper, rubber, chemical, metal & non-metal)	11 (11)	17 (20)
Statistics Section 3 (machinery, electric & electronic, vehicles, jewelry)	10 (10)	20 (24)
Analysis Section	3	2
Dissemination Section	2	2
Computer Section 1 (Monthly Survey)	8	8
Computer Section 2 (MOI as a whole)	8	8
Total	57	86

Note: The number shows that of staff. ( ) shows the number of industries. The staff for annual survey are not included.
: Asterisk mark (*) shows a staff who will work mainly at other section such as Statistics Section 1, Computer Section 1 etc.

The above proposal in Chart 1.4.3 only deals with reallocation of the staff. Reorganization is an important approach to improved effectiveness of work, but it does not necessarily promise the fruitful results. The real problem with the OIE lies in the lack of expertise of each staff and in well organized teamwork. How to recruit or train the staff for a specific job continuously and how to secure smooth workflow chain from execution to dissemination are the next issue to be addressed by the management.

Note: OIE reorganization and its personal change were implemented on June 16 and 19, 2000, during the third field survey of the JICA Team. The IIS was dissolved, and its 7 staff moved to Divisions 1 and 2. Two of the remaining IIS staff moved to the IDSS, and one joins the newly born Dissemination Section (DS) together with four other staff moved from the Policy and Planning Division. The IIC's analytical work is to be done by three other divisions, that is Policy & Planning Division for integrated indices, and Divisions 1 and 2 for sector indices. As a result, the IIC faced a net decline in staff by three. The new IIC structure is summarized below. Comparing with above Chart 1.4.3, the IDSS needs additional 19 staff for the 2nd stage.

Staff Allocation of New IIC

Administration	2
IDSS	15
DS	5
Computer Section (Monthly survey)	8
Computer Section (MOI as a whole)	8
Total	38

Chapter 2 Development Plan for the Industrial Indices

This chapter reviews the current state of progress which the IIC has achieved under the support from the JICA, summarizing the outcome of the Study on the Development of Industrial Statistics in the Kingdom of Thailand. The chapter also presents a guideline for the farther development of the Industrial Indices of the IIC.

2.1 Index Calculation Method: the Laspeyres Formula

(1) Need for general index

To understand the overall picture of industrial production in a country/region, the change in production of an individual commodity is not sufficient since many kinds of commodities are produced in the country/region. Instead, an index which can indicate the general trend of production should be created by aggregating the figures representing each of selected commodities produced in the country/region.

(2) The Laspeyres formula

The method of calculating a general index can be expressed by the formula shown below.

$$Q_t^L = \frac{\sum_{i=1}^{n} p_{i0} q_{it}}{\sum_{i=1}^{n} p_{i0} q_{i0}} \times 100 \quad \text{--- [1]}$$

Q: General index, q: Quantity, p: Price,
0: Base period, t: Compared period,
i: Selected commodities (i = 1, 2, 3, …, n)

The formula [1], which uses the fixed price of the baseline period (= p_{i0}), is called the “Laspeyres formula”. It is the most common method for the general index.

2.2 Basic Explanations on the "Industrial Indices"

2.2.1 Principles of the Industrial Indices

(1) Target of the Industrial Indices

The primary purpose of the "Industrial Indices" is to provide a set of common indicator as a yardstick for evaluating the business conditions.

They must cover the following three main aspects of the industrial activity in order to determine the overall condition of manufacturing sector of a country/region.

- Production: Trend on the supply side
- Shipment: Trend on the demand side
- Inventory: Gap between supply and demand

(2) Critical factors for the Industrial Indices

a) Promptness and timeliness

Since the business condition can change rapidly and drastically, the Industrial Indices should be provided promptly and timely at short intervals. That is the main reason why their dissemination cycle is set monthly.

b) Reliability

In order to ensure the reliability of the Industrial Indices, the following four requirements must be met.

1) To cover leading or important industries in a country/region as measured by share in GDP, share in total employment and other relevant criteria.
2) To survey major manufacturing establishments (factories) in each of the selected industries.
3) To provide a reasonable evaluation on the current condition of the manufacturing sector base on appropriate analyses.
4) To provide useful and relevant information to forecast the business condition.

c) Comparability

Classifications of commodity and industry for the Industrial Indices should coincide with relevant economic indicators such as GDP, trade and labor. That enables diverse analysis by comparing a variety of statistics.

d) Continuity

Once compilation and dissemination of the Industrial Indices is commenced, it should continue unless clearly justified. Discontinuity harms not only the reliability of the Industrial Indices but also the credibility of the government, and it takes a long time to recover the lost credibility.

2.2.2 Production Process and Index Items

(1) Production process of the manufacturing sector

Figure 2.2.1 shows the general production process in the manufacturing sector. The most products are shipped to those who demand them, while a portion of them remains in inventory at the establishments. Products shipped can be divided broadly into two types: production goods which are put into production again as the raw material; and finished goods which are supplied to end uses. Among finished goods, some are separated from the production process consumed by households, and the remaining ones are used for fixed capital formation including investment in equipment and construction. Both production goods and finished goods may be exported if they are demanded in a foreign country.

A set of indicators which consists of the Industrial Indices should basically correspond to the main activities such as production, shipment, inventory and so on shown in Figure 2.2.1.

(2) Elements of the Industrial Indices providing comprehensive information on the manufacturing sector

In general, the Industrial Indices are expected to include the following index items.

1) Production Index

Purpose: To indicate the production trend of the manufacturing goods.

Calculation: $\frac{q_{it}}{q_{i0}} \times 100$

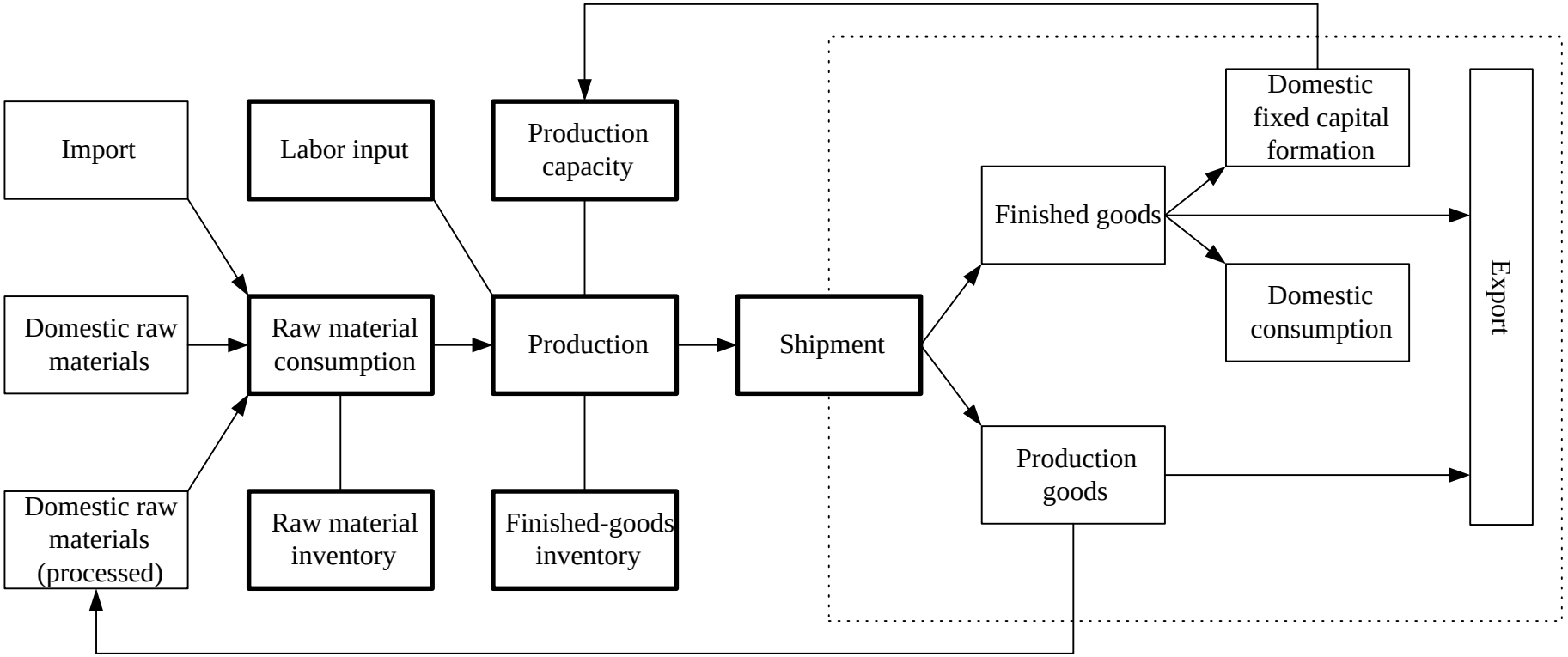
q: Quantity (of production),

0: Baseline period, t: Compared period,

i: Selected commodities (i = 1, 2, 3, …, n)

Interpretation: A rise in this index means that the supply of the goods is activated.

Figure 2.2.1 Production Process of the Manufacturing Sector



2) Shipment Index

Purpose: To indicate the trend of demand for the manufacturing goods.

Calculation: Same as the Production Index.

Interpretation: A rise in this index means that demand for the goods is increasing.

3) Finished-goods Inventory Index

Purpose: To indicate the trend of the stock level of manufacturing goods that has not been shipped from the establishments yet.

Calculation: Same as the Production Index.

Interpretation: A rise in this index provides two perspectives as follows:

- If the rise occurs because the shipment is not increasing rapidly compared to production, that suggests a future business downturn.
  --- Unintended increasing in inventory.
- If the rise occurs because the establishments are increasing the stock of products with expectation that demand will grow rapidly before long, that suggests a future business recovery.
  --- Intended increasing in inventory.

4) Inventory Ratio Index

Purpose: To indicate if the current supply-demand relation of a product is becoming tight, by calculation the ratio of the finished goods inventory to the shipment.

Calculation: $\frac{q_{it}^{I} / q_{it}^{S}}{q_{i0}^{I} / q_{i0}^{S}} \times 100 = \frac{r_{it}}{r_{i0}} \times 100$

q^{I} : Quantity of inventory, q^{S} : Quantity of shipment,

r : Ratio of inventory to shipment

Interpretation: A rise in this index means that the supply and demand situation is easing in the market.

2.2.3 Procedures to Compile the Industrial Indices: the "Current Survey of Production" in a Monthly Working Cycle

(1) The "Current Survey of Production"

The Industrial Indices are to be compiled through the so-called "Current Survey of Production", which attempts to identify the current (=latest) and actual state of

industrial activities such as production, shipment including domestic sales and exports, inventory, production capacity, labor input, etc.

(2) Procedures of the Current Survey of Production

a) Execution of questionnaire survey

First of all, the provider of the Industrial Indices should carry out questionnaire surveys. The questionnaire is distributed to selected establishments and collected after they enter the actual figures related to industrial activities.

Generally speaking, the collection rate of the questionnaire should be over 80% in order to secure the statistical reliability of the Industrial Indices.

b) Examination and editing of collected questionnaires

After collecting the questionnaires of the Current Survey of Production, the figures in each questionnaire should be examined whether they contain any questionable information or error. If there are any problems, the examiner should ask the respondent to correct figures.

The figures that are found to be incorrect must be replaced with correct ones on the original questionnaires. This work is called “editing” of the questionnaire.

c) Data input into the computer system

The corrected figures are to be input into the database of the computer system for data processing.

d) Completion of the “absolute figures” required for index calculation

The Industrial Indices are made from the actual total of production, shipment, inventory, etc. for each of the selected commodities. For example, the Production Index is calculated from the total production quantity of a selected commodity, and the Inventory Ratio Index is from the total quantity of shipment and finished-goods inventory. These totaled figures for each commodity are called “absolute figures”, as distinguished from the “index”.

e) Index calculation and tabulation of the calculation results

Once the absolute figures of all data items have been stored in the database to cover all the major establishments, the computer is ready to calculate the Industrial Indices. The calculation should be made using the Laspeyres formula as proposed in **2.1**.

After the calculation, the results should be tabulated into a prescribed form every time so that they can be thoroughly and efficiently inspected.

f) Analysis of factors for remarkable changes in index trends

Production, shipments and inventory constantly fluctuate with the changes in economic conditions. The provider of the Industrial Indices should watch the trends of the indices continuously and clarify the factors for remarkable changes in the index trends. Such an analysis is important in order to explain the current situation in the manufacturing sector to the statistical users.

g) Dissemination of the Industrial Indices

At last, the Industrial Indices should be disseminated to statistical users with some comments/explanations on the current situation in the manufacturing sector.

Major dissemination media are printed publication (official report) and Web publication over the Internet.

(3) Monthly working cycle for the Industrial Indices

In general, such shot-term statistics as the Industrial Indices have no use if they are published several months after the survey. (For example, few need January data available in July.) Obviously, the “promptness” is the most important factor of the Industrial Indices.

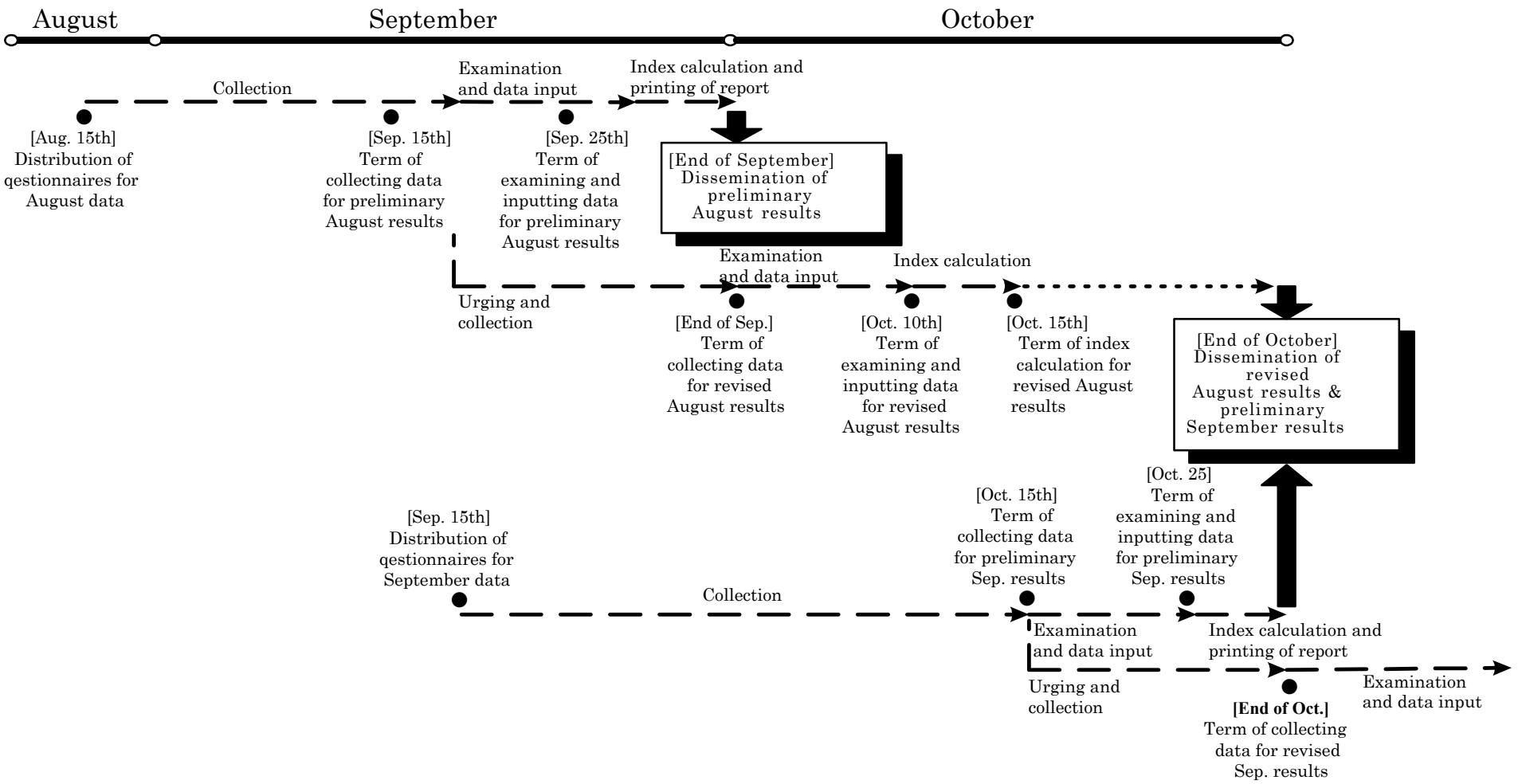
In order to secure promptness, it is desirable to repeat the procedures for the Industrial Indices in a monthly cycle, keeping the lead-time for dissemination less than two months.

A recommended time schedule of the monthly working cycle is shown in Figure 2.2.2. When the Industrial Indices are compiled for August, the following milestones are recommended:

1) To distribute the questionnaire of August to the respondents on August 15;
2) To collect the questionnaires by September 15;
3) To carry out examination/editing of the questionnaires, input the data into the computer system, and complete the absolute figures by September 25;
4) To perform index calculation and the analysis on the calculation results, arrange the results into an official monthly report, and finally, disseminate the report to the statistical users at the end of September.

The time schedule is intended for the “preliminary figure”, which may include some estimated data. It should be re-calculated to the “revised figure” in the next month, which is completely based on the actual data without any estimation.

Figure 2.2.2 Monthly Working Cycle for the Industrial Indices (Preferable Time Schedule)



2.3 Perspective of Development of the Industrial Indices

2.3.1 Expansion of the Current Survey of Production

The IIC should follow the three stages shown in Table 2.3.1 when expanding the scale of the Current Survey of Production for the Industrial Indices.

Table 2.3.1 Three Stages for the Current Survey of Production

Stages	Number of establishments and Industry (*1) to be surveyed	Names of indices to be disseminated
1st stage	- 377 establishments - The core 10 industries (*2) - Coverage (*3) = 30%	**Preliminary Indicators**
2nd stage	- 1,266 establishments - 34 industries - Coverage = 70%	*Reference Indices*
3rd stage	- 2,200 establishments - 63 industries - Coverage = over 80%	*Industrial Indices*

*1 "Industry" means the classification at the 4-digit level of the International Standard of Industrial Classification (ISIC).

*2 "The core 10 industries" include the followings:
1) Processing and preserving of fish and fish products (ISIC 1512)
2) Manufacture of malt and liquors (1553)
3) Preparation and spinning of textile fibers and weaving of textiles (1711)
4) Manufacture of knitted and crocheted fabrics and articles (1730)
5) Manufacturing of weaving apparel, except fur apparel (1810)
6) Manufacture of refined petroleum products (2320)
7) Manufacture of cement, lime and plaster (2694)
8) Manufacture of electric valves, tubes and other electric components (3210)
9) Manufacture of TV, radio, sound or video recording (3230)
10) Manufacture of motor vehicles (3410)

*3 "Coverage" means the percentage of value-added of the selected industries to the total value-added of the manufacturing sector.

<Current Situation>

The IIC has already satisfied the requirements for the 1st stage, as it has achieved a continuous high questionnaire collection rate and started to disseminate the monthly report of the *Preliminary Indicators* since May 2000. In addition, the IIC has launched

the expanded survey covering 1,266 establishments in selected 34 industries including the core 10 industries. Thus, the IIC is in transition to the 2nd stage at present.

<Future Development>

The 3rd stage is the final destination where the IIC will compile the full-scale Industrial Indices that covers most of the industries (around 60) in the Thai manufacturing sector, handling around 2,000 establishments.

It is expected to take at least one year to satisfy the requirements for the 2nd stage though it depends on a number of factors such as manpower, budget and cooperation of surveyed establishments.

When shifting over from the “Preliminary Indicators” to the “Reference Indices” or from the “Reference Indices” to the “Industrial Indices”, it should be noted that statistical continuity is not secured at the general index level since the number of selected industry is different among each index series.

2.3.2 Selection of Index items

It is necessary to select particular index items within available resources, based on the priorities shown in Table 2.3.2.

Table 2.3.2 Priorities for Index Selection

Index items		Priorities for index items (*)		
		A	B	C
a) Basic indices				
	1) Production Index	●		
	2) Shipment Index	●		
	3) Finished-goods Inventory Index	●		
	4) Inventory Ratio Index	●		
b) Other indices				
	1) Production Capacity Index		○	
	2) Capacity Utilization Index		●	
	3) Labor Input Index			○
	4) Labor Productivity Index			●
	5) Raw Material Consumption Index		○	
	6) Raw Material Inventory Index		○	
	7) Raw Material Inventory Ratio Index		○	

* The meanings of A, B and C are as follows:

A: Very important and indispensable for evaluating the current condition of the manufacturing sector.

B: Necessary to be included in the index selection for overall evaluation of condition, if enough resources are assured.

C: Necessary only in case there are not any other reliable indicators of the same purpose.

Note: ●: Index that can be calculated by the new computer system of the IIC.
○: Index that cannot be calculated by the new computer system of the IIC.

<Current Situation>

At present, the IIC can compile all of the basic indices, which correspond to the priority A, by using the new computer system, and in addition it can calculate the Capacity Utilization Index included in the priority B and the Labor Productivity Index in the priority C (see the "●" in Table 2.3.2).

<Future Development>

For the time being, the IIC should concentrate on these current six indices for several reasons.

First of all, as for the indices that are related to raw materials, it is practically infeasible to calculate the general index accurately due to the lack of basic data used for weighting.

Secondly, there are some fundamental problems with the Capacity Utilization Index and the Labor Productivity Index, as mentioned below, which will take a considerable

time to be solved. Therefore, it is not practical to increase the item of index in such a situation, with the restriction of manpower and budget.

As for the Capacity Utilization Index, the questionnaire of the Current Survey of Production asks capacity for each commodity, since it has been unknown as to which commodity can represent the exact capacity of a selected industry in Thailand. Therefore, in order to make the Capacity Utilization Index reliable, it is necessary to find out the appropriate commodities for measurement of capacity by examining responses made in the completed questionnaire.

On the other hand, when calculating the Labor Productivity Index, the gross production value is used instead of the value-added. In this point, the index is not always an appropriate indicator on the labor productivity at present, and might mislead the users. Therefore, it is strongly recommended to consider the statistical meaning of the index and to be careful when disseminating it, though there are not any reliable official statistics on the labor productivity in Thailand.

2.3.3 Institutional Relationship for Advice and Support

<Current Situation --- Regular meeting of the Working Group>

The Working Group (WG) was originally set up in 1999 during the Phase I, and its meeting had been held by the IIC at every proper time, inviting the BOT, the NESDB, the NSO, the MOC, and the Division II of the OIE, to discuss important issues concerning the design of the Current Survey of Production, etc. Since November 1999, it has been held monthly regular meetings with the same members to inspect the monthly report of the *Preliminary Indicators*.

The WG should continue monthly regular meeting in the future based on the outline shown in Table 2.3.3.

Table 2.3.3 Outline of the Working Group

Purpose:	To inspect the monthly report of the Industrial Indices.
Issue:	- General condition of the manufacturing sector in Thailand - Contribution ratios by industry - Trends of production, shipment and inventory in the selected industries (including the comparison of the indices between the IIC and the BOT.)
Member:	- The IIC (chair organization) - Long-term experts from the JICA - Bank of Thailand - National Economic and Social Development Board - National Statistical Office - Ministry of Commerce - Division II of the OIE
Frequency:	Monthly

<Future Development --- Advisory Committee for Development of Index>

In the course of developing full-scale Industrial Indices, the IIC should build a closer cooperative relationship with other statistical organizations and experts, as such cooperation will benefit them as follows:

1) It enables the IIC to receive theoretical advice and technical support from the outside source as the need arises.
2) It provides an opportunity for the IIC to utilize existing information/statistics and know-how of other organizations to make the Industrial indices more precise and exact.
3) It promotes the Industrial Indices of the IIC to the public through various connections from the related organizations.

There are several important issues remaining in the Industrial Indices development process, and the IIC does not have any permanent advisors except for the long-term experts sent by the JICA at present. On the other hand, attendants at the monthly regular meetings of the WG are often very concerned about such basic matters as the method of index calculation, the weight for index integration, etc., which suggests the need for other opportunities than the WG meetings.

Consequently, the IIC should set up the Advisory Committee that discusses the basic issues with regard to the development of the Industrial Indices and provides effective and realistic advice about how to deal with them, as shown in Table 2.3.4.

Table 2.3.4 Outline of the Advisory Committee

Purpose:	To considers the basic issues with regard to the development of the Industrial Indices and provides effective and realistic advice about how to deal with the issues.

Issue:	- Modification of design of the Current Survey of Production
	  - Selection of industry and commodity
	  - Selection of establishments
	  - Questionnaire design
	- Development of the Industrial Indices
	  - Revision of the base period and linkage of index
	  - Preparation of the weight
	  - Introducing the seasonal adjustment

Member:	- IIC staff - Expert of the index theory - Expert of the industrial statistics - Expert of industrial/commodity classifications - Government officials of the industrial policy, trade policy, and relevant statistics such as Input-output Table, National Accounts, etc. - Representatives from the member organizations of the Working Group
Frequency:	Quarterly, or every six months

2.3.4 Mid-term Schedule for Development of the Industrial Indices

Based on the concepts discussed above, the mid-term schedule since 2000 for development of the Industrial Indices is as shown in Figure 2.3.1. The perspective of the development in the near future is summarized in this schedule.

a) In 2000-2001: 1st stage of the Current Survey of Production

During the stage, the IIC is expected to compile and disseminate the *Preliminary Indicators* based on the 377 establishments that belong to the core 10 industries by using the new computer system.

Concurrently, additional 889 establishments that belong to other 24 industries are to be selected for the Current Survey of Production.

In addition, the IIC should calculate six items of index, and at the same time, it should evaluate the accuracy and reliability of those six items. Then, it should disseminate the selected proper items as the *Preliminary Indicators*.

b) 2002-2004: 2nd stage of the Current Survey of Production

During this stage, the IIC is to expected to compile and disseminate the *Reference Indices* based on the 1,266 establishments that belong to the 34 industries by using the new computer system.

Concurrently, additional 930 establishments that belong to other 29 industries are to be selected for the Current Survey of Production.

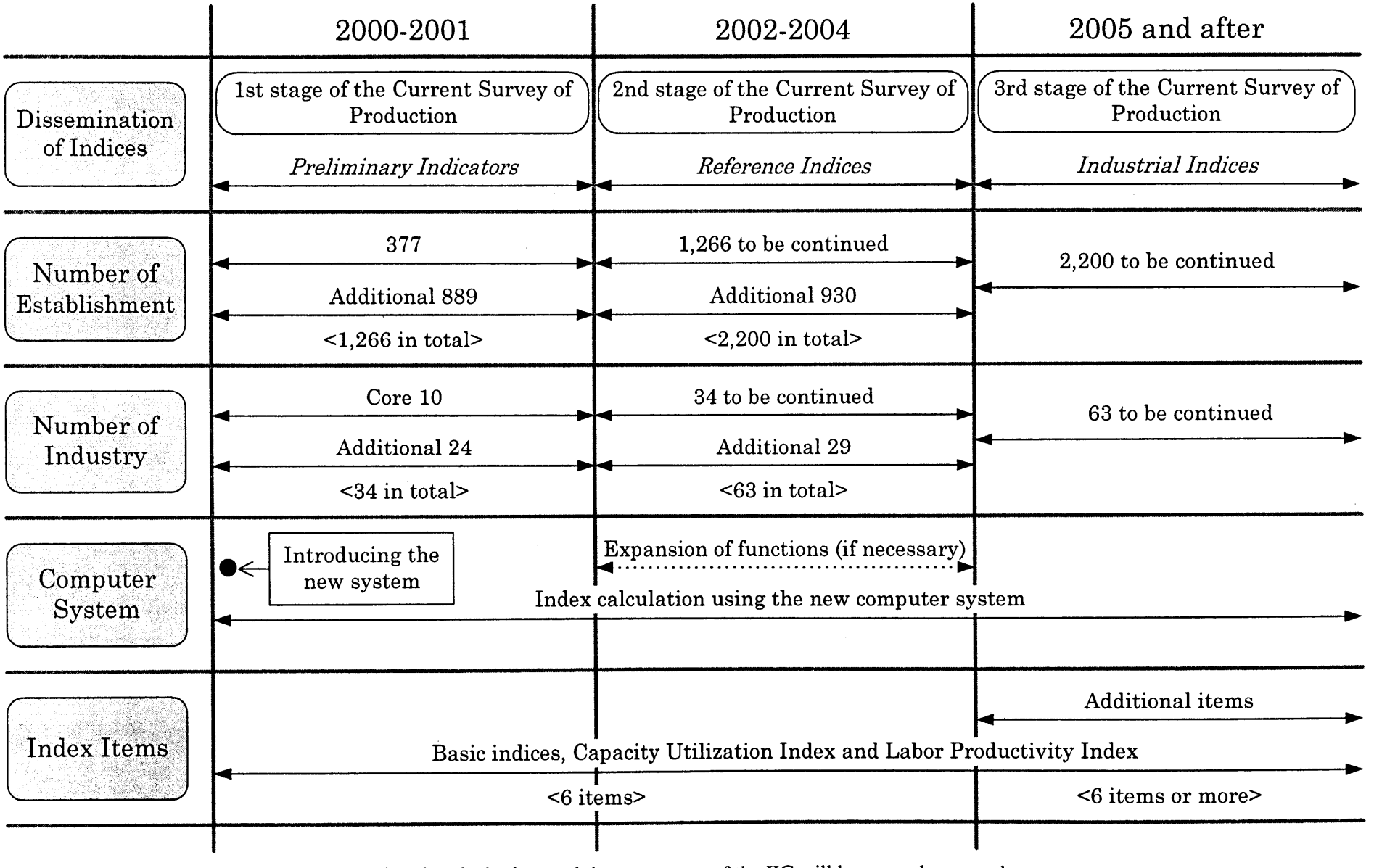
In addition, the IIC should continuously calculate the same six items of index and might consider increasing of items with lots of needs from the statistical users.

c) 2005 and after: 3rd stage of the Current Survey of Production

During this stage, the IIC will compile and disseminate the *Industrial Indices* based on 2,200 establishments that belong to 63 industries by using the new computer system.

It might calculate some additional indices as well as the original six.

Figure 2.3.1 Mid-term Schedule for Development of the Industrial Indices



Note: This schedule is on the assumption that the budget and the manpower of the IIC will be proprely assured.