Chapter 5

Implementation Plans for Model Projects

Chapter 5 Implementation Plans for Model Projects

To verify effectiveness of action programs discussed in Chapter 4, the following two model projects will be conducted.

Model Project 1: Strengthening of INTI's soft technology-related SME support capability

Model Project 2: Configuration of the SME database

5.1 Model Project 1: Strengthening of INTI's Soft Technology-related SME Support Capability

5.1.1 Reason for Selection and Project Description

(1) Reason for selection

For small- and medium-sized manufacturers to improve productivity and competitiveness by using an optimum combination of management resources, business and production management techniques (soft technology) are essential, as much as production technology and skills. In Argentina, however, companies have a very limited opportunity to learn soft technology, and a technical support system using soft technology has not been established, neither by the public nor private sector.

A formal system and organization to promote general education on soft technology to local SMEs, to disseminate basic knowledge, and to provide initial guidance in the field should be developed and built by the government as part of industrial promotion policy. These efforts will lead to the improvement of society's ability to absorb technology (infrastructure to adopt technology through formal technology transfer) and accumulation of technology transfer will be conducive to self-supportive development of the national economy.

The study team has selected INTI as the core element of the soft technology support system in the country and as the counterpart organization of the model project for the following reasons.

INTI has been engaged in research and industry support activities under the Ministry of Economy and Production, covering broad fields including industrial testing, research and development, quality control, standardization, and pollution control. It provides technical support, diagnosis, and training for micro enterprises and SMEs. It operates 29 centers throughout the country, including 5 regional centers.

Major advantages of INTI as the soft technology support center are summarized as follows.

- It is the sole public technical support organization having a nationwide network of offices

and is expected to play an active role in deploying the results and benefits of the model projects through continuous activities.

- It is a key member of "agencia", which is becoming the leading organization in the total SME support system on a local basis.
- For extension service personnel in charge of soft technology, a general understanding and knowledge on production technology is essential. While INTI has a limited number of staff in charge of soft technology, it has many staff members who have background knowledge on production technology and long contact with manufacturing industries and companies.
- It has a long history of research and support activities in the field of production technology and its mission and activities are recognized by the private sector, together with a close contact with related industries.
- INTI has a wide variety of testing equipment and materials as well as abundant human resources to provide the linkage with production technology, such as analysis of materials, in connection with guidance for soft technology to small- and medium-sized manufacturers.

INTI, through long-time dealing with small- and medium-sized manufacturers, recognizes that soft technology, together with production technology and skills, is essential in improving competitiveness. It is planning to improve support capability and expand activities. INTI Rosario takes a lead in the area of soft technology support, and INTI Rafaela is preparing to start soft technology support service in cooperation of JICA's senior volunteers (SVs), although INTI Rosario has a limited number of staff and is currently serving only six companies; guidance relating to kaizen and 5S for two companies, and ISO certification for four companies.

(2) Project description

The model project is designed to strengthen INTI's soft technology support capability for small- and medium-sized manufacturers through the following activities, thereby to ensure its self-support activity after the end of the study: 1) joint field guidance with experts of the study team; and 2) direct technology transfer by experts of the study team.

5.1.2 Benefits Expected

Benefits expected from implementation of the model project are summarized as follows.

- INTI staff will gain skills and experience in soft technology support.
- INTI will develop manuals relating to soft technology support service for small- and medium-sized manufacturers.

- INTI will be recognized by the public sector as a soft technology support organization as the model project results in improvement of productivity and performance of beneficiary companies.
- INTI will establish soft technology support as one of its major services, next to production technology, and will be able to build a system to strengthen the service including budget allocation.
- Improvement of productivity and performance of beneficiary companies under the model project will be made known to the public, and public recognition on importance and effectiveness of soft technology – which is current absent in the private sector – will be improved to stimulate demand for soft technology support.

5.1.3 Project Area and Reason for Selection

As candidate model project areas, five areas in three provinces were selected by the counterpart and were compared and analyzed, as discussed in 3.1. Major findings from the comparative analysis are summarized as follows.

The three provinces – Buenos Aires, Santa Fe, and Córdoba – have major industrial agglomerations in the country. In particular, the automotive parts industry – one of the three target sectors subject to the present study – has the largest concentration, especially in Buenos Aires and Córdoba. The Province of Buenos Aires is most industrialized among the three provinces. On the other hand, Santa Fe has an agglomeration of the agricultural machinery and parts sectors. Many clusters of agricultural machinery manufacturers are found along Highway Route 9 that connects Buenos Aires and Córdoba. In contrast, there are not many automotive parts suppliers in Santa Fe.

Looking at the five areas and their characteristics, San Martín is the birthplace of industry in the country and still has an agglomeration of SMEs, especially automotive parts manufacturers. It accounts for more than 10% of PBI in the Province of Buenos Aires. Lanús City has a large concentration of small- and medium-sized manufacturers and serves as a major production area for leather goods in the country. However, no distinctive characteristics are observed about the three target sectors under the study, except for a relatively large number of food processing equipment parts suppliers. Rosario holds major portions of the three sectors in Santa Fe and accounts for nearly 50% of PBI in the province. In particular, agricultural machinery and parts manufacturers are highly concentrated. Rafaela is the second largest industry city in Santa Fe, next to Rosario, and its main products are dairy and other foodstuffs. Also, there are a large number of manufacturers of

equipment to process dairy products. Finally, Córdoba accommodates manufacturers in the three sectors. In particular, there are five automobile assembly plants in the city, and agglomeration of automotive parts suppliers constitutes a distinguished feature for Córdoba.

Details of the simplified corporate diagnosis conducted as part of the preliminary study and its results are presented in 3.3. In selecting the project areas, Lanús was dropped from the final list as the city did not have a qualified organization to implement the model project and the municipal government did not have interest in the project. Then, the simplified corporate diagnosis project was conducted in four cities, San Martín (Buenos Aires), Rosario (Santa Fe), Rafaela (Santa Fe), and Córdoba (Córdoba). This selection is justified by the fact that comparative analysis of the five areas revealed that Lanús did not have a distinctive concentration of the three target sectors, while an agglomeration of one or more sectors was observed in other four cities. The four cities have also INTI's regional centers that will assure smooth implementation of the model project

Based on the above evaluation, the following four areas were selected as the model project implementation area.

Model Project 1 implementation area

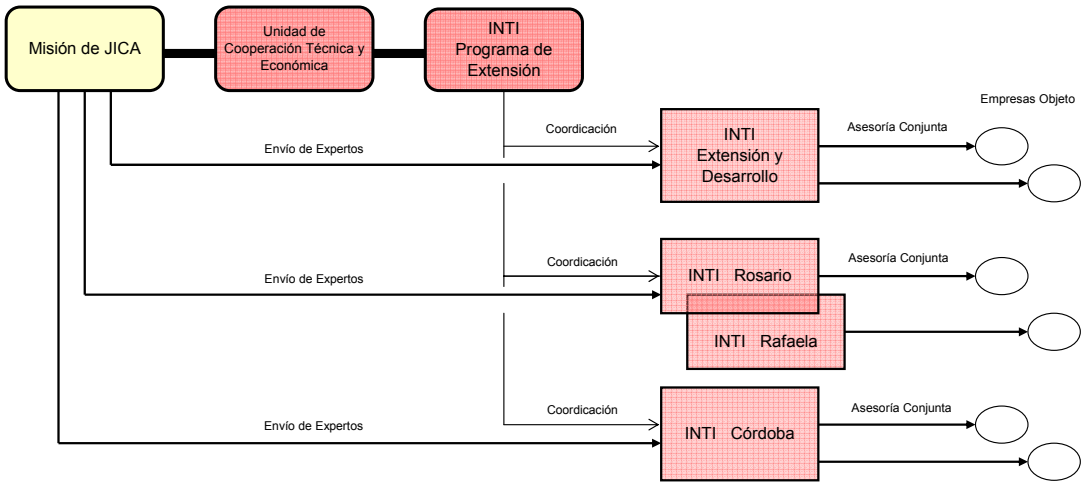
- San Martín, Province of Buenos Aires
- Rosario and Rafaela, Province of Santa Fe
- Córdoba, Province of Córdoba

5.1.4 Project Implementation Organization and Schedule

Within INTI, Program de Extensión of the head office overseas SME support conducted by various centers. It will serve as the counterpart organization for the study team and will be responsible for management and coordination of Model Project 1 that will be carried out in the four areas, and the formulation of follow-up activity plans after the end of the project.

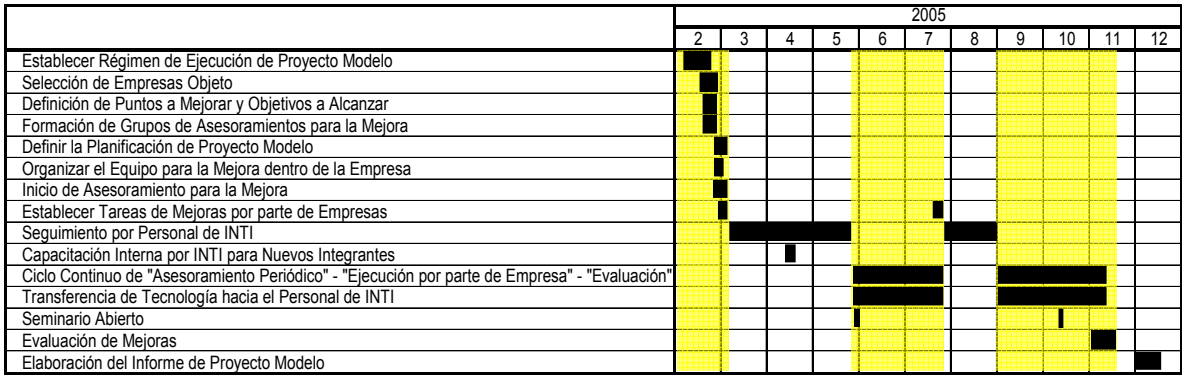
During the project implementation period, the study team's experts in soft technology will stay at INTI centers in the project implementation areas and will work with INTI staff to provide field guidance for companies participating in the project. At the same time, they will carry out technology transfer to INTI staff in the form of lecture or seminar.

Fig. 5.1 shows the proposed implementation organization for Model Project 1 and Fig. 5.2 the implementation schedule. Note that the shaded period in Fig. 5.2 denotes the period during which the study team will conduct field survey.



Source: JICA Study Team

Fig. 5.1 Implementation Organization for Model Project 1



Source: JICA Study Team

Fig. 5.2 Implementation Schedule for Model Project 1

5.1.5 Participating Companies and Their Selection Process

Companies participating in the model project were selected by the study team and INTI from companies for which the simplified corporate diagnosis was conducted. Based on diagnostic charts prepared for companies, the study team prepared a list of candidate companies and examined it with INTI. Each candidate company was revisited to confirm the intent to participate and preparedness to extend companywide cooperation before the final selection was made.

In selecting companies for the model project, the following criteria were applied, in addition to the mandate to choose companies in all the three target sectors.

- Companies that expressed to the study team experts/INTI staff, in the course of the simplified corporate diagnosis, a strong interest in participating the model project.
- Companies which are expected to make active participation by management. As kaizen is a companywide initiative, a good understanding and leadership of management is indispensable for SMEs in Argentina that are dominantly family-operated.
- Companies that are not scheduled to undertake a major project during the project period, which may affect implementation of the model project, such as factory relocation or expansion.
- Companies that have reached an agreement with the study team/INTI on kaizen themes.
- Companies that will likely produce favorable results on a kaizen them within a limited project period.

Table 5.1 lists companies that have been finally selected for the model project.

Table 5.1 List of Participating Companies

Company Code	Name of company	Main Products	Number of employees	*
SM-1	Retenes M.A.I. de Horacio de Luca	Rubber	13	
SM-7	Aniceto Gomez S.A.	Suspension Spring	50	Participating company-1
SM-10	Altíssimo S.A.	Fan	43	
SM-12	Otia	Washer	24	
SM-14	Burkool	Rubber parts for window	60	
SM-15	RET S.R.L.	Automobile interior	110	
Ro-1	Metaltécnica S.R.L.	Chemical spreaders, Agricultural machinery parts	70	
Ro-2	Di Benedetto Hnos. S.A.	Oil ring, Rolling ring	167	
Ro-3	Fonderia S.A. (Small Casting)	Cylinder liner	45	
Ro-6	KRETZ S.A.	Electronic scale	60	Participating company-2
Ro-7	Fabrica Rosarina de Accessorios (FRA) S.C.	Back mirror	23	
Ro-9	Fundición Gatti	Large castings	65	Participating company-3
Rf-1	ETMA S.A.	Universal joint	80	
Rf-2	NELSO Ferreura S.R.L.	Tractor parts, Hydraulic chuck	90	
Rf-3	FRAUTSCHI S.A.C.I.F.I.A.	Valves for food processing equipment	44	
Rf-4	Engracor S.A.	Gear	32	
Rf-5	TopLine Engineering Argentina	Cylinder head	35	Participating

	S.A.			company-4
Co-1	RUBOL S.A.I.C.F.	Automobile castings	58	Participating company-5
Co-2	FUMISCOR	Automobile press parts, Plastics	47	
Co-3	F.A.E.S.A. S.A.I.C.	Laminated spring	33	Participating company-6
Co-4	A. Giacomelli S.A.	Torque rod	193	
Co-5	Resortes Argentina S.A.I.C.	Springs	37	
Co-6	V.H.B. Repuestos Agrícolas	Seeder	130	
Co-11	MET. Degiorgis S.A.	Engine parts, Machinework	77	

Source: JICA Study Team

* "Corporate Diagnosis Chart", "KAIZEN Sheet" and "Guidance Record and Result" are included in this Report for example.

5.1.6 Implement Plans for Participating Companies

Details of the project were discussed with companies which have been confirmed to have the intent of participation during the visit, including the kaizen theme, target, necessary input, and an implementation schedule for each theme. Then, the KAIZEN sheet (Hoja de KAIZEN) prepared by the study team was revised to reflect the discussion and agreement and signed by the company, the study team expert, and INTI staff.

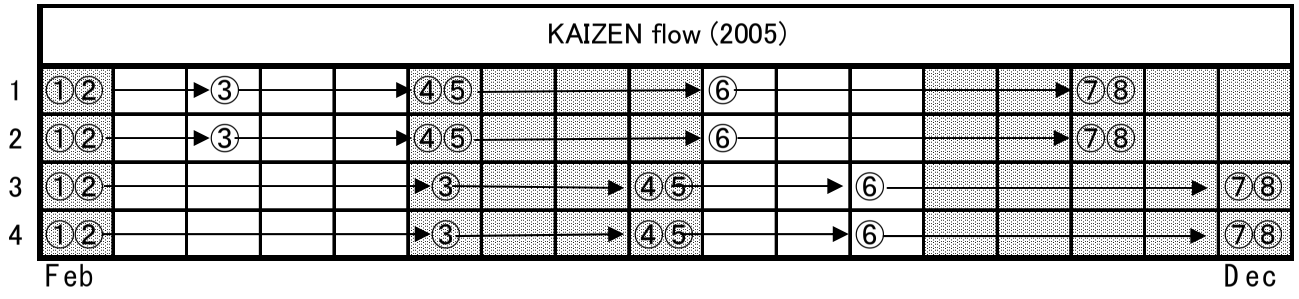
Table 5.2～5.7 present "KAIZEN Sheet" for six companies.

Table 5.2 Participating Company 1 of Model Project 1　KAIZEN Sheet

SM-7	Aniceto Gomez S.A.	Sector	Automotive parts
Diagnosis chart prepared by:	Teruo Higo	Parts name:	Suspension spring
Improvement plan made by:	Akira Hata	No. of employees:	50

Theme for Improvement	Current state	Objectives	Evaluation method
To promote and establish smooth interface between production processes	While the interface in the preceding process is generally defined, more study and examination is required for the subsequent process is required.	1. Interface needs survey for the subsequent process 2. Establishment of an equipment maintenance system 3. Definition of the automation rate and evaluation on the current state 4. Upgrading of production technology	1. Preparation of the existing layout drawing 2. Development of daily inspection checklist 3. Definition of the automation rate as the basis of evaluation 4. Organization of a production technology group

Inputs	Future tasks/actions
1. Problem identification on the layout 2. Acquisition or compilation of operation manuals 3. Development of conceptual plans 4. Selection of group members	1. Preliminary interface design and new layout plans 2. Preparation of inspection checklists and scheduled maintenance lists 3. Quantitative evaluation 4. Development of an organizational chart and work standards



Legend

① Confirmation of management policy
② Selection of KAIZEN theme
③ Current state study and data collection
④ Establishment of target values
⑤ Development of KAIZEN plan
⑥ Implementation
⑦ Evaluation
⑧ Delineation of future issues

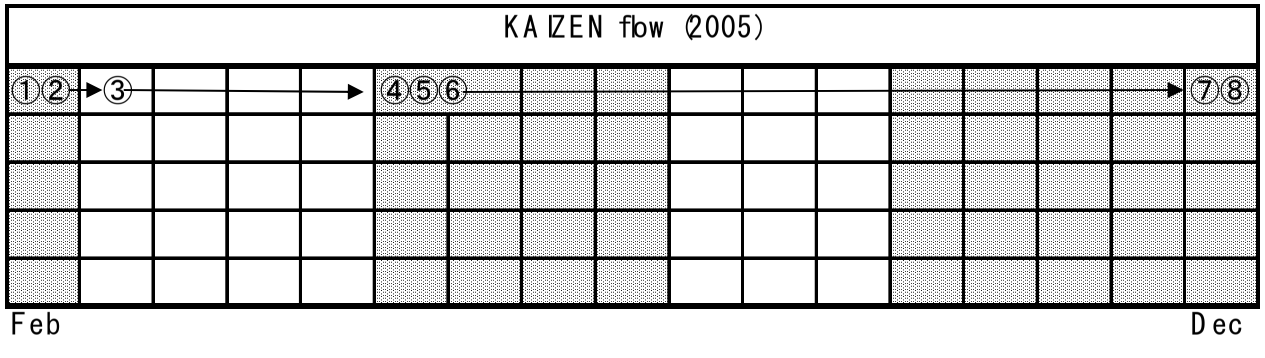
Field survey by the study team

Table 5.3 Participating Company 2 of Model Project 1　KAIZEN Sheet

RO-6	KRETZ S.A.	Sector	Food processing machinery
Diagnosis chart prepared by:	Akira Hata	Parts name:	Electronic scale
Improvement plan made by:	Teruo Higo	No. of employees:	60

Theme for improvement	Current state	Objectives	Evaluation method
5. Development of new products 6. Introduction of an optimum inventory management method	Top ranking in the electronic scales market 1-1 Electronic scales for food supermarkets 1-2 The product line is limited. 2 Poor inventory management	Product development, research, marketing 1-1 Exploration of new product categories and markets 1-2 Research and development of electronic scales measuring weight and body fat percentage (sales) 2 Introduction of an optimum inventory management technique (cyclic inventory taking) and inventory reduction	Quantitative measurement of results 1-1 Expansion of sales and export markets 1-2 Expansion of sales and export markets 2 10% reduction

Inputs	Future tasks/actions
Organization of the “KAIZEN project team” including the management 1-1 Organization of a committee 1-2 Market study 2 Current state study	Preparation and establishment of an organization to promote and achieve the Objectives 1-1 Selection of members, economic analysis and evaluation through brainstorming, such as profitability 1-2 Study, research, and examination of “sample products” by the company 2 Preparation of an inventory data table



Legend

① Confirmation of management policy
② Selection of KAIZEN theme
③ Current state study and data collection
④ Establishment of target values
⑤ Development of KAIZEN plan
⑥ Implementation
⑦ Evaluation
⑧ Delineation of future issues

Field survey by the study team

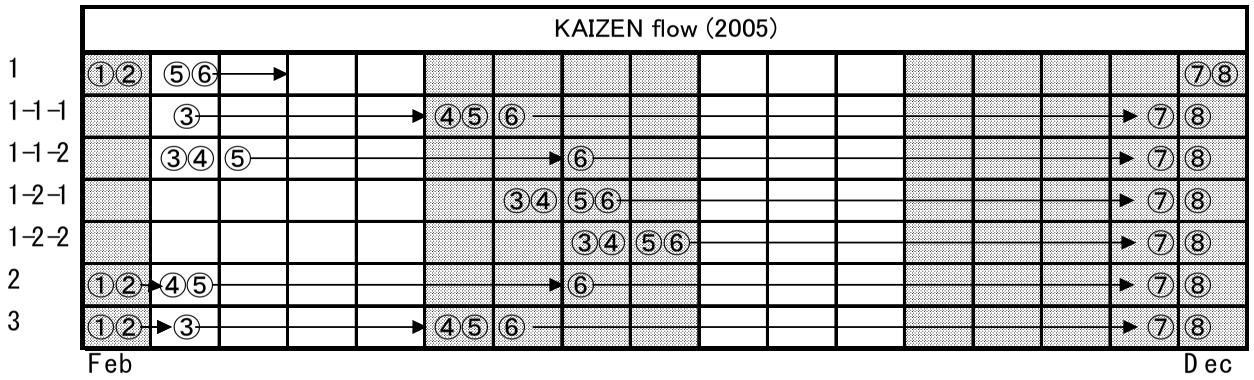
Table 5.4 Participating Company 3 of Model Project 1　KAIZEN Sheet

RO-9	FUNDICION GATTI S.R.L.	Sector	Automobile, agricultural machinery
Diagnosis chart prepared by:	Nobushige Fukase	Parts name:	Large castings
Improvement plan made by:	Nobushige Fukase	No. of employees:	65

Theme for improvement	Current state	Objectives	Evaluation method
1. Enhancement of quality control 2. Introduction of 5S 3. To meet John Deere's demand and requirements (if possible)	1-1 Rejection rate: 3% in total, 2% for occurring in the factory, 1% for those discovered in the machining process 1-2 The green sand mixing equipment is aged and its renewal is underway (scheduled to be renewed in June 2005). 2. The working environment deteriorates as one goes inside the factory, and dirt deposits on the floor. 3. During the field survey in February, intention of John Deere will be confirmed.	1-1 Reduction of rejection rate The target is set to reduce the rejection rate to two-thirds or less the present level. 1-2 To ensure the smooth startup of the new greensand mixing equipment and to establish work standards quickly (documentation of work standards). 2. To form small groups for each shop to promote 5S activity.	1-1-1 Percentage of defective reduction compared to the present rejection rate 1-1-2 Rejection rate trend 1-1-3 Level of achievement compared to the target rejection rate established by each group 1-2 Percentage of defective reduction attributable to green sand 2. Measurement at fixed points by photograph, and comparison and evaluation of actual levels of improvement

Inputs	Future tasks/actions
I. The president becomes a principal leader in charge of promoting all themes for improvement. II The head of the quality control department becomes the head of the secretariat who is responsible for planning and promotion 1-1-1 Monitoring and analysis of rejection rates and their causes (monthly, weekly, daily) 1-1-2 Organization of small groups for each shop to promote defective reduction activities 1-2-1 Establishment of control items and values for the new green sanding mixing equipment	To clearly define an organization to promote the themes and prepare an organizational chart. 1-1 To determine and analyze monthly rejection rates and their causes in the previous year and plot them in graphs and Pareto charts. 1-2 To examine an organization of small groups, organize participating workers into groups, and propose a working theme for each group. 2. To examine an organization of small groups, organize participating workers into groups, and propose a working theme for each group.

1-2-2 Development of work standards 2. Promote of 5S and defective reduction as main themes for small group activities	



Legend
① Confirmation of management policy
② Selection of KAIZEN theme
③ Current state study and data collection
④ Establishment of target values
⑤ Development of KAIZEN plan
⑥ Implementation
⑦ Evaluation
⑧ Delineation of future issues

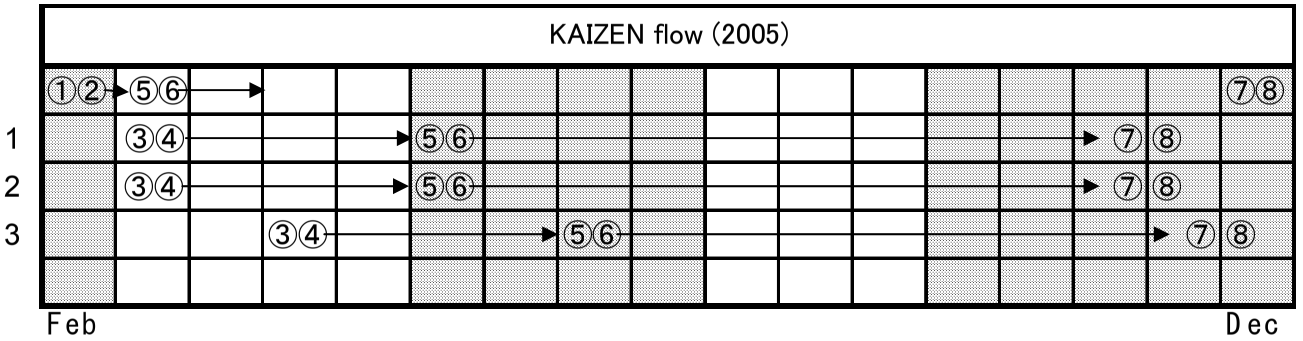
Field survey by the study team

Table 5.5 Participating Company 4 of Model Project 1　KAIZEN Sheet

RF-5	TOPLINE ENGINEERING ARGENTINA S.A.	Sector	Automobiles
Diagnosis chart prepared by:	Nobushige Fukase	Parts name:	Cylinder head
Improvement plan made by:	Nobushige Fukase	No. of employees:	35

Theme for improvement	Current state	Objectives	Evaluation method
Reduction of the rejection rate for cylinder head castings	At present, the percentage of rejects that occur in the factory ranges between 10% and 12%, of which nearly 85% are due to a casting defect.	To promote quality control by the foundry shop by setting a target to reduce casting defects by half. 1 Reduction of the rejection rate by half through small group activities 2 Reviewing and modification of control items and values based on the QC schedule 3 Reviewing and modification of work standards	Percentage of defective reduction compared to the present rejection rate for castings 1 Level of achievement in terms of percentage of defective reduction set by each group 2 Upon completion of the QC schedule, it is assumed that the objective has been fully achieved. 3 Upon completion of reviewing and revision of work standards for the foundry process, it is assumed that the objective has been fully achieved.

Inputs	Future tasks/actions
I The president becomes a principal leader in charge of promoting all themes for improvement. II. To appoint the head of the foundry shop as personnel in charge of promotion and to launch activities 1 To foster small group activities in the shop and promote defective reduction activities. 2 To prepare the QC schedule and review and modify control items and values for each process. 3 Based on confirmation of the progress of quality improvement, items that have produced measurable results are incorporated into work standards.	To clearly define an organization to promote the themes and prepare an organizational chart. 1 To determine and analyze monthly rejection rates and their causes in the previous year and plot them in graphs and Pareto charts 2 To review and revise the QC schedule, and if not, to confirm control items and values in each production process and compile results in a table. 3 To review work procedures in each production process, and identify and list key points that affect product quality.



Legend
① Confirmation of management policy
② Selection of KAIZEN theme
③ Current state study and data collection
④ Establishment of target values
⑤ Development of KAIZEN plan
⑥ Implementation
⑦ Evaluation
⑧ Delineation of future issues

Field survey by the study team

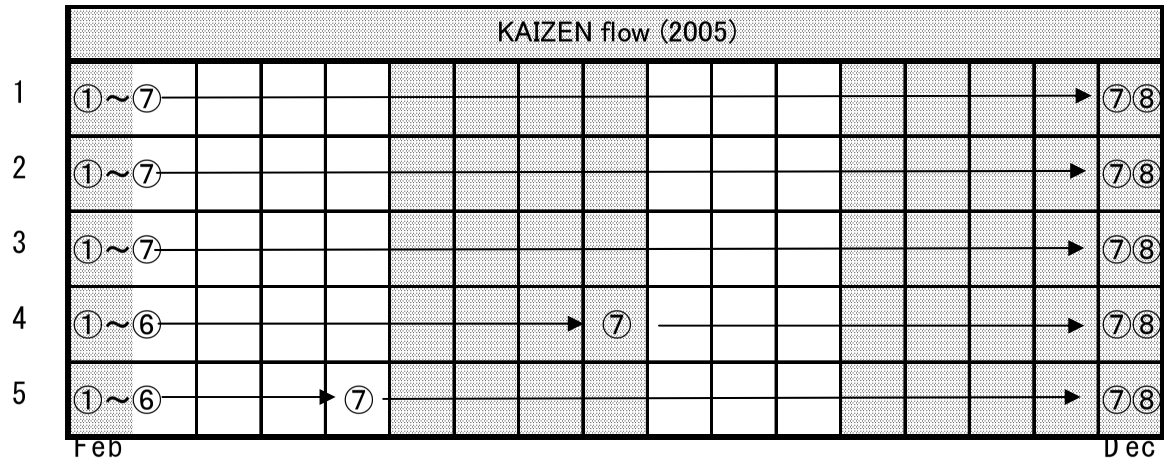
Table 5.6 Participating Company 5 of Model Project 1　KAIZEN Sheet

CO-1	RUBOL S.A.I.C.F.	Sector	Automobile
Diagnosis chart prepared by:	Akira Hata	Parts name:	Automobile castings
Improvement plan made by:	Rinji Wakamatsu	No. of employees:	58

Theme for Improvement	Current state	Objectives	Evaluation method
1 Management policy (short-term/long-term)	1 Corporate vision is unclear. (Example of slogan to show long-term strategy: “Go global with quality and cost innovation)	1 Establishment of control items: Sales, profit, quality, production volume (delivery schedule), cost, safety, 5S, number of KAIZEN cases, attendance rate ... selection of items and establishment of quantitative objectives and KAIZEN strategy and method	1 Assessment of the level of agreement between actual values for control items and the company’s status: evaluation and improvement of data sampling method, man-hours, and level of accuracy
2 Introduction of the KAIZEN suggestion system	2 KAIZEN activities are not carried out organizationally (piecemeal improvement?)	2 Establishment of the employee suggestion system: basic design- method, review and award Example of objective setting: 4 suggestions/person/month, profit/month (monetary benefit $__+ unquantifiable effect $__)	2 Number of suggestions (KAIZEN completed); monetary effect; number of awards, etc.
3 Activation of small group activities	3 Six groups are active (once per week?), starting at 6:00 a.m., attended by the president twice per year. Details of group meetings, including agenda and achievements, are not known.	3 After confirmation on content of meeting and actual results, discussion of activity policy and strategy linked to corporate policy	3 Development and establishment of a quantitative method to evaluate level of contribution of “small group activity effect” to corporate performance, and its implementation
4 Value added increase for shipped products	4 Value added of finished products is low due to specialization in forging.	4 Development of measures to increase value added.　Example: To achieve increase in value added by partially processing a product by using internal dies making technology. Because “machining to reference plane” for the manufacturer in the next step is mutually	4 Increase in value added and status of the next process (company), such as occurrence of problems

				beneficial in terms of cost reduction and quality improvement, new contract manufacturing or partial machining should be examined.			
5	Reduction of work-in-process and delivery time	5	Two-month inventories of 33 types of steel materials must be large financial burden. From acceptance of materials to product shipment: around 4 months?	5	1) Procurement of materials in a smaller lot through joint purchase in a region 2) Reduction of work-in-process, quality improvement, and cost reduction through reduction of lead time from requisition of materials to product shipment	5	Lead time from materials input to product completion; decrease in work-in-process and value; rejection rate; etc.

Inputs		Future tasks/actions	
1	Establishment of departmental control items and target values for each “company” control item; development and operation of the control item; development and operation of the control system including reporting procedures and the appointment of a manager in charge of control; execution of actions in response to actual results	1	Trial implementation of management, measurement, and evaluation of control items, and improvement and standardization
2	Enhancement of equipment and education, jointly with the KAIZEN group; establishment of group-based target values; 3 suggestions/person/month; profit $__ per month	2	Trial implementation of evaluation, award system, etc. KAIZEN activity should, in principle, be carried out jointly with concerned workers and should be repeated until satisfactory results are obtained.
3	Example 1) Preliminary design of the employee suggestion system → development of proposed content → discussion → trial implementation → problem identification and study → corrective measures and efforts to promote and propagate the system Example 2) Joint establishment and delineation of content of companywide and departmental control items, target values, measurement and evaluation methods, corrective measures, etc.	3	
4		4	Investigation should be made to identify products that are shipped as forgings and that can be machined internally in order to solve quality and other problems, followed by implementation of machining as determined.
5	Reduction of lot size through reduction and improvement of die exchange time, and process learning (analysis of exchange work →reduction and improvement of man-hours → reduction of lot size → reduction of inventories of materials and finished products	5	Analysis and measurement of die exchange work and content (measurement of highest speed); improvement of 5S activity to arrange and reduce work-in-process, making work flow visible.



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① Confirmation of KAIZEN theme
② Selection of KAIZEN theme
③ Current state study and data collection
④ Establishment of target values
⑤ Development of KAIZEN plan
⑥ Implementation including periodical evaluation
⑦ Evaluation
⑧ Delineation of future issues

Field survey by the study team

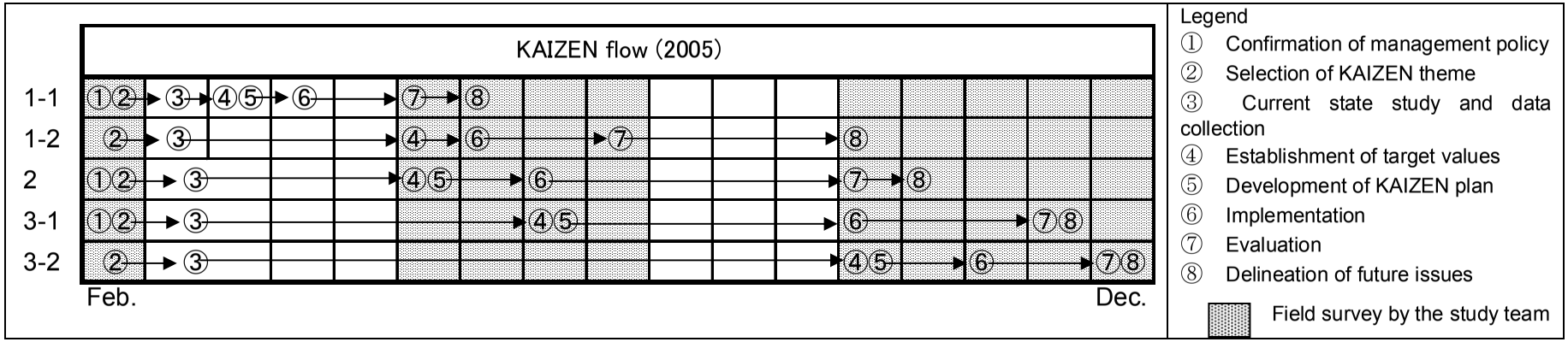
Table 5.7 Participating Company 6 of Model Project 1　KAIZEN Sheet

CO-3	F.A.E.S.A. S.A.I.C.	Sector	Automobile, Agricultural Machinery
Diagnosis chart prepared by:	Nobushige Fukase	Parts name:	Laminated spring
Financial improvement plan made by:	Hiromichi Kato	No. of employees:	33

Theme for improvement	Current state	Objectives	Evaluation method
1 Awareness of management accounting	1 Partially recognized	1-1 Awareness of management accounting and preparation of accounting rules	1-1 Continued implementation, check, correction/implementation
		1-2 Classification of cost department and cost elements (variable and fixed costs), and preparation of departmental cost accounts	1-2 Establishment of cost departments and elements
2 Introduction of the budget system	2 None	2 Preparation of a budget/actual result monitoring system on the basis of departmental cost accounts	2 Establishment of budget values, monitoring of actual values
3 Preparation for cost management	3 None	3-1 Determination of required products and units, establishment of accounting data and the consolidated calculation system	3-1 Establishment of budgeted (standard) values, monitoring of actual values
		3-2 Cost variance analysis, budgeted (standard) values, monitoring of actual values, continuation of analysis	3-2 Formal implementation of the plan-do-check cycle

Inputs	Future tasks/actions
1-1 Sharing of recognition by the management, managers, production department/shops and accounting staff	1-1 Awareness of the need for management accounting, preparation of relevant rules (manuals)
1-2 Joint work by production department/shops and accounting department for classification of cost departments and elements	1-2 Evaluation on classification of cost departments and elements
2 Establishment of the system through joint work by each department and accounting staff	2 Collection of and research on documents and case studies

3-1	Preparation for the establishment of the system through joint work by production department/shops and accounting staff	3-1	Collection of and research on documents and case studies
3-2	Establishment of the system through joint work by each department and accounting staff and feedback of results of analysis	3-2	Collection of and research on documents and case studies



5.1.7 Project Design Matrix (PDM)

Project Design Matrix : Model Project - 1 Improvement of INTI Soft Technology Capability to Assist SMEs

Study Period : 2004.9-2006.3 — Target Sector : Mechanical Components and Parts Industry

Model Project Period : 2005.2-2005.12 — Target Area : San Martín, Rosario, Rafaela and Córdoba and their outskirts

Narrative Summary of Project	Indicator	Methods of Verification	Outer Factors
Upper Goal Productivity of target sector SMEs is improved.	Production per employee	Questionnaire Interview	No serious economic turmoil Industry continues to grow. No. of companies does not decrease.
Project objective INTI capability of assisting SMEs with soft technology (ST) is improved.	Number of companies assisted by INTI in ST	INTI record of services	No drastic recession in the target sector
Results 1. Capabilities of INTI experts are improved. 2. Manual for soft technology consulting services is completed. 3. Methodology and ST promotional organization are established. 4. SMEs recognize necessity and effectiveness	Number of experts (defined by criteria) Manual for ST consulting services Organization chart of INTI Budget approval Number of participants in seminars and Eagerness to introduce ST of SMEs Satisfaction of target companies	INTI document INTI document INTI document Records of seminar and workshops Interviews with companies and associations	No. of ST experts is not decreased. INTI continues to give ST services to SMEs. INTI and other organization continue to promote ST.
Activities 1-1 To set up criteria and the goal for ST experts 1-2 To foster ST experts in INTI through model company consulting services 1-3 To evaluate candidates of ST expert and make the future foster plan 2-1 To help INTI to assemble guide of ST consulting services 3-1 To help all concerned to understand the effectiveness of ST 3-2 To design the institutional set-up for promotion of ST 3-3 To facilitate contents of ST promotion activities 4-1 To give ST consulting services to selected target companies 4-2 To evaluate the effectiveness of ST and select good practices 4-3 To present the activities and good practices of target companies	**Input** (JICA Team) 1) 8 Japanese experts 2) CP training 3) Joint Consulting Services for SMEs 4) Seminars and workshops	(Argentine side) 1) C/P a. INTI, b. SSEI, c. SSEPyMEyDR b. industrial organizations 2) regional governments 3) target companies	1. Security condition in the target areas is not aggravated. 2. Business condition of target sector is not changed dramatically. **Pre condition** All concerned organizations and target companies accept the project.

Source: JICA Study Team

5.2 Model Project 2: Configuration of the SME Database

5.2.1 Reason for Selection and Project Description

(1) Reason for selection

As the core element of action programs, to strengthen the function of Red de Agencias Regionales de Desarrollo Productivo, which is promoted by SSPyMEyDR as SME policy that is in line with the country's decentralization policy was proposed in Chapter 4.

SSPyMEyDR positions Red de Agencias Regionales as an important policy tool to achieve the key policy objectives of SME promotion and regional development and has been setting agencia's activity goals and implementing its reinforcement programs every year. "Agencias" are an independent non-profit organization that is jointly established by local government and the private sector. Their budget, staffing and activities vary greatly. As SSPyMEyDR does not provide financial assistance, the strengthening of "agencias" is made in the form of staff training and the development and provision of support tools, as seen in previously implemented programs.

SSPyMEyDR sets forth information service and promotion of inter-company linkages and grouping as its non-financial activity. One of key support tools for such activity is a company database storing information on local companies. In Argentina, there are directories of member companies held by trade associations and local databases prepared by provincial governments that have a limited coverage at a specific time. However, there is no SME database that can be accessed to meet business needs and that is regularly maintained to keep its reliability. Thus, "agencias" do not have a basic support tool.

Previously, the development of SME database has been promoted in Latin American countries under the assistance of UNIDO. In Argentina, a database containing approximately 1,200 manufacturers of machine and plastics parts in Buenos Aires, Rosario and Cordoba was developed in 1992, under the leadership of UIA and SSPyMEyDR. It was periodically upgraded for a while and was highly valued. However, it was found to be inadaptable to the Internet environment due to system problems and has been unused since a few years ago.

SSPyMEyDR plans to build a SME database covering both the manufacturing and non-manufacturing sectors and to use is as a SME support tool through "agencias" activities. However, the plan has not been materialized for various reasons and the model project is expected to pave the way for its implementation.

(2) Project description

The model project consists of: 1) development of a database system that can accommodate SSPyMEyDR's future plans and is adaptable to the Internet environment; 2) collection of sample data and construction of the SME database; and 3) promotion of the database use by SMEs.

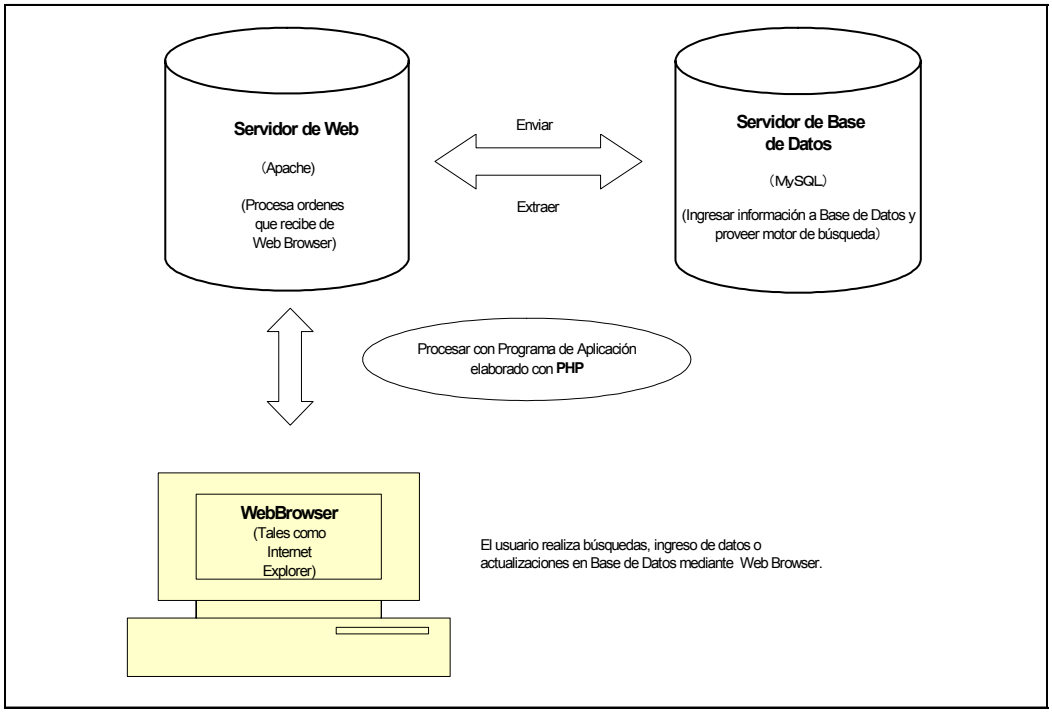
Sample data will be collected from companies in the target sectors of automotive, agricultural machinery, and food processing equipment parts. Project areas will be selected at the database design stage.

5.2.2 General Outline of the SME Database

The primary objective of the database on small- and medium-sized manufacturers to be developed under the model project is described below. In addition to basic company information, the database will include data and information that address major issues facing SMEs, such as the shortage of skilled workers and the need for consulting service.

The SME database is designed to provide companies that look for parts suppliers and job shops that do contract manufacturing or machining with basic information required to decide on direct negotiation with a potential supplier, such as the company size, process, and production/processing capacity.

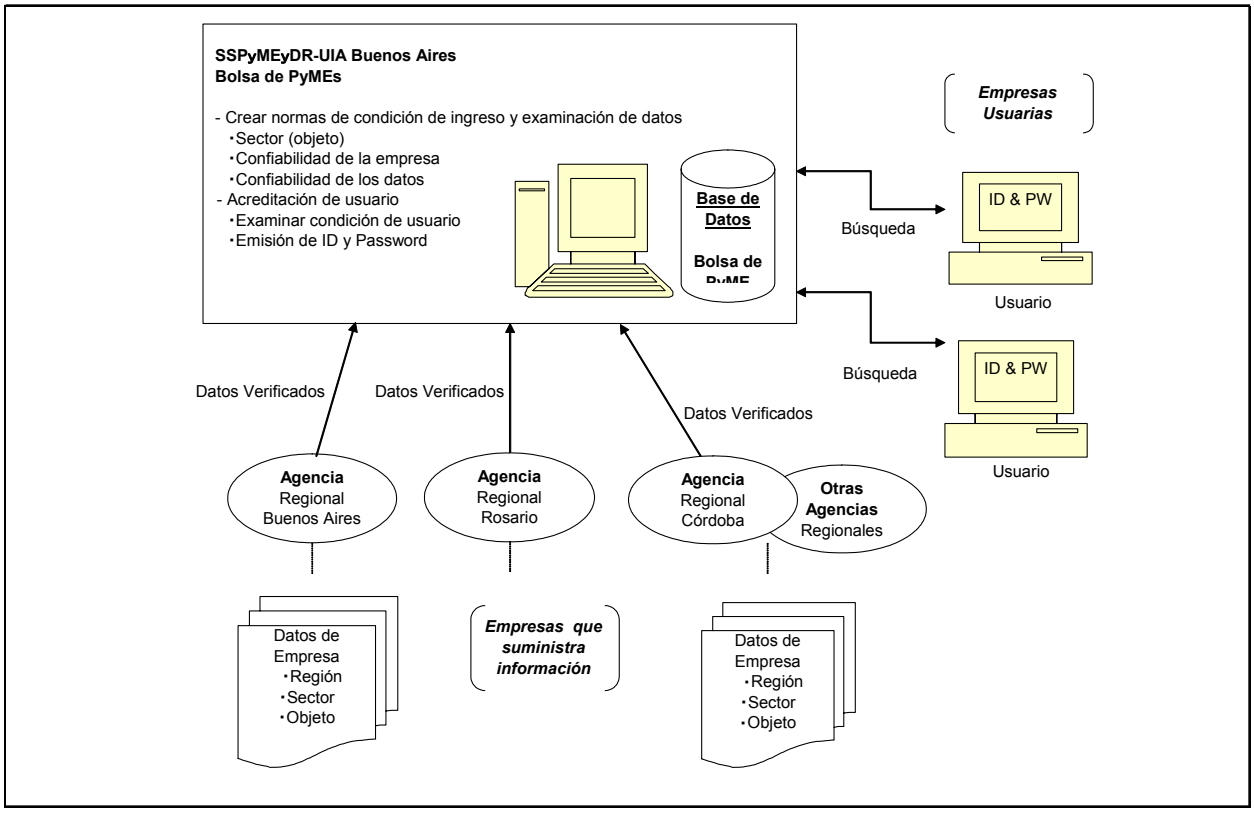
Figures 5.3 and 5.4 shows system design and operation concepts of the proposed database.



Característica-1	Tiene buena compatibilidad con los Web Browsers convencionales y su uso es posible mediante Internet.
Característica-2	El uso es libre y gratuito mediante Open Source Software.
Característica-3	El desarrollo cuesta tiempo y mes-hombre reducidos. Por consiguiente su costo es bajo
Característica-4	Permite la ampliación de Base de Datos.
Característica-5	Es lo último en tecnología para el desarrollo de aplicaciones sobre la Base Web.

Source: JICA Study Team

Fig.5.3 System Design Concept of the Database



Source: JICA Study Team

Fig.5.4 Operation Concept of the Database

5.2.3 Benefits Expected

- Construction of the SME database system that is adaptable to the Internet environment
- Establishment of the maintenance and operation system for the future database
- Availability of the SME database to local SMEs
- Use of the SME database as a support tool by "agencies"
- The building of the foundation to expand the coverage of the database by area and sector

5.2.4 Implementation System and Schedule

(1) Implementation system

The model project will be carried out by SSPyMEyDR under the assistance of the study team. UIA, which has experience in database development, and INTI as member of "agencias" will extend cooperation. "Agencias" will be mainly engaged in collection and examination of sample data and will also collect opinions of local SMEs to be reflected in database design. The system will be developed according to specifications prepared by SSPyMEyDR and the study team, and the development work will be commissioned by the study team to a local contractor.

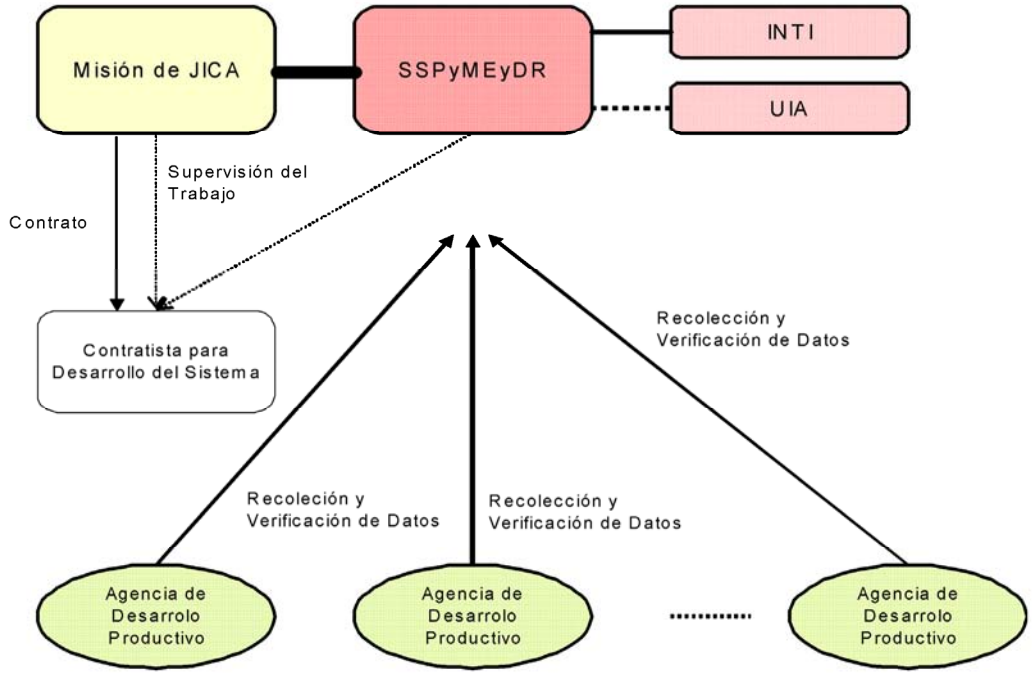
Table 5.8 summarizes development tasks and division of responsibilities, namely development of database specifications, system development and preparation of user manuals, collection of sample data, PR and promotion, preparation of maintenance manuals.

Table 5.8 Model Project 2　Responsibilities of the Tasks

	Study Team	SSPyMEyDR	"Agencias"	Contractor
Development of database specifications	○	○	○	
System development and preparation of user manuals				○
Collection of sample data		○	○	(○)
PR and promotion	○	○	○	
Preparation of maintenance manuals	○	○	○	○
(DB system maintenance and operation)		○	○	

Source : JICA Study Team

Fig.5.5 shows the implementation organization for the model project.

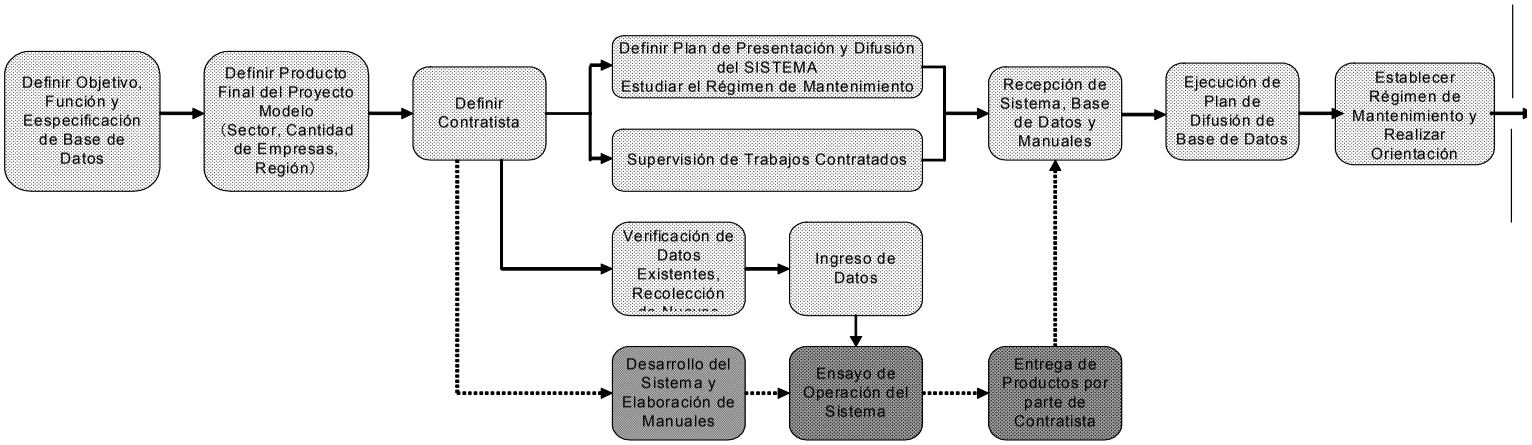


Source: JICA Study Team

Fig.5.5 Implementation Organization for Model Project 2

(2) Implementation schedule

Fig.5.6 shows a general work flow for the model project, based on which an implementation schedule has been developed as shown in Fig.5.7. Note that the shaded period in Fig. 5.7 denotes the period during which the study team will conduct field survey.



Source: JICA Study Team

Fig. 5.6 General Work Flow of Model Project 2

	2005										
	2	3	4	5	6	7	8	9	10	11	12
Establecer Régimen de Ejecución de Proyecto Modelo											
Estudio de Demanda											
Definir Objetivos y Contenido de Base de Datos											
Definir Producto Resultante del Proyecto Modelo											
Estudiar el Régimen de Mantenimiento											
Contratación de Contratista											
Desarrollo del Sistema y Elaboración de los Manuales											
Revisión de Datos Existentes											
Recolección de Nuevos Datos											
Ingreso de Datos											
Ensayo de Operación del Sistema											
Recepción y Entrega de los Productos Elaborados por Contratista											
Definir Plan de Presentación y Difusión del Sistema											
Ejecución de Plan de Difusión del Sistema											
Establecer el Régimen de Mantenimiento											
Evaluación de Proyecto Modelo											
Hacer Plan de Expansión del Sistema											
Elaboración del Informe de Proyecto Modelo											

Source: JICA Study Team

Fig. 5.7 Implementation Schedule for Model Project 2

5.2.5 Project Design Matrix (PDM)

Project Design Matrix : Model Project - 2　Building SMEs Database

Study Period：2004.9-2006.3　　Target Sector：Mechanical Components and Parts Industry

Model Project Period：2005.2-2005.12　　Target Area：San Martín, Rosario, Rafaela and Córdoba and their outskirts

Narrative Summary of Project	Indicator	Methods of Verification	Outer Factors
Upper Goal SMEs database system is extended to all regions and sectors of SMEs in Argentine	Regions and sectors covered by the database.	Database directory	No serious economic turmoil
Project objective SMEs database is used by the relevant agencies of SSEPyMEyDR as a supporting tool for SMEs.	Track record of utilizing the database Track record of added functions of the relevant agencies	Interview Brochures	Network of development agencies continues. Development agencies continue their activities.
Results 1. Model database system is built. 2. Database management system and maintenance organization are established. 3. Database is used by stakeholders.	Source program and system documents Budget Organization chart SSEPyMEyDR website Access count on the internet	Software developer Interview SSEPyMEyDR documents Internet Access counter	Development agencies accept the database system. Government allocates enough budget to manage and maintain the database system. Government does not change the decision on the database.
Activities 1-1 To make the research on the needs of the database content 1-2 To consign the database system development and monitor the progress 1-3 To test the database system for evaluation 1-4 To collect sample data of SMEs 2-1 To make the plan for management and maintenance of the database system 2-2 To submit the plan to upper authority for approval 2-3 To train staff for maintenance of the database 3-1 To make ads and brochures for promoting the database usage 3-2 To have seminar and workshops for promotion	**Input** (JICA Team) 1）Japanese experts 2）Software development (consignment) (Argentine side) 1）C/P a. INTI, b. SSEI, c. SSEPyMEyDR b. UIA		1. Security condition in the target areas is not aggravated. 2. Business condition of target sector is not changed dramatically. **Pre condition** Core organizations accept the idea of database.

Source: JICA Study Team

Chapter 6

Results of Implementation of Model Projects

Chapter 6 Results of Implementation of Model Projects

6.1 Model Project 1

6.1.1 Guidance Record

(1) Guidance record and result sheet

During the second field survey, the simplified corporate diagnosis program was conducted for formulation of the model projects and its results were compiled into diagnosis charts. Then, the following documents were prepared as activity record for the model project: 1) KAIZEN sheets agreed with companies selected for the model project (see Chapter 5); and 2) guidance record and result sheets for all the participating companies, describing details of field guidance provided by the study team during the fourth, fifth and sixth field surveys and implementation results, and evaluation on results of guidance based on the KAIZEN sheets.

"Report on Model Projects" present diagnosis charts, KAIZEN sheets, guidance record and result sheets for all the participating companies. The guidance record and result sheets for six (6) companies are shown below.

Note that the model project was started for 24 companies under main kaizen themes of production management and management accounting (an accumulated total of 27 companies for two themes), but 4 companies dropped out due to internal troubles, a customer-related problem, or a time overlap with preparatory activity for ISO certification.

Table 6.1 Participating Company 1 of Model Project 1　Guidance Record and Result

1	Company visited	Aniceto Gomez S.A.		Code No.: SM-7
2	Total number of visits	13		
3	Study team member who made visit	Akira Hata	INTI Personnel	Ivan, Rodolfo
4	Personnel representing the visited company	Cristian Cabo (Jefe de Planta)		

5	KAIZEN theme-1	(Theme title)	Needs survey of interface in the subsequent processes: reduction of setup time for full automatic coil winding machines
		Situation prior to use of guidance	The company manufactures coil springs for passenger cars. The production process, after setting dimensions of spring steel materials, consisted of the following steps: □ cutting; □ annealing; □ coil winding; □ quenching; □ tempering; □ deburring; □ coating; □ drying; □ marking; □ inspection; and □ packaging. Automation was progressed for each step. On the other hand, interface between the above steps depended largely on manual work. It was required to mechanize the interface without being satisfied with the present state.
		Guidance record	Among the above processes, □ coil winding drew attention of the study team. Development of the full automatic coil winding machine was started in July 2003. A prototype machine was completed in October 2004, and through the series of field tests, it was introduced to the production line in March 2005. It started commercial operation in mid-April 2005. The machine is positioned as a core element of the company's coil spring production. In particular, the ability to make setup change quickly when product types are changed determines the machine's output capability. Based on this recognition, it was decided to implement a kaizen project focusing on reduction of setup time. 1) First measurement of setup time The setup work was recorded by video, which was then analyzed second by second. The results indicated that it took 17 minutes and 21 seconds from the start of setup to the end. The setup time as daily operation was determined to be approximately 18 minutes (as of June 2005). At the same time, the following time loss was identified. 1. Time to make adjustment for trial operation 2. Redundant time relating to programming of the automatic cycle 3. Time spent for repetition of blank runs without feeding materials 2) Reduction plan Started with 18 minutes as setup time in the phase one, the following reduction goals were set in three steps. The rate of progress was also indicated in percentage for each phase by setting the setup time as 100%.

Phase one	18 minutes（as of June 2005）	100%
Phase two	12 minutes（as of Aug. 2005）	67% （12/18x100%）

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Phase three</td><td>6 minutes（as of Nov. 2005）</td><td>33% （6/18x100%）</td></tr>
<tr><td>Phase four</td><td>3 minutes（as of Feb. 2006）</td><td>17% （3/18x100%）</td></tr>
</table>
The study team member gave the following advices.
1) Exchange of coil core metals was carried out by two workers and one of them was mobilized from a semi-automatic shop. As the worker might not be available all the time, it was advised to redesign the work to be done by a single worker.
2) Refinement of shape of the core metal edge
Some core metals that were fitted to the core winding machine had square edges and it took additional time to position the core metal at the center. It was advised to provide tapered fittings for the core metal as male and a face plate of the machine's main spindle as female to allow one step connection between the core metal and the face plate and help reduction of setup time.
3) Effective use of trial piece
As a trial piece is subject to original inspection, which must not be omitted, it should be put into the manufacturing flow. This would contribute to yield improvement.</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>In phase three, setup time was reduced to around six minutes according to video analysis. A major factor for this achievement was the improvement of a redundant sequence relating to coordination with the machine hardware. The setup time of six minutes means the achievement of single-step setup. According to the president, competitors in Brazil have reportedly achieved the six-minute level, although they use different types of machines. Thus the company has reached the average level for the industry.</td></tr>
<tr><td>6</td><td>KAIZEN theme-2</td><td>（Theme title）</td><td>Machine maintenance system</td></tr>
<tr><td></td><td></td><td>Situation prior to use of guidance</td><td>The company's factory had nearly 100 machines, of which only 65 units were registered in the machine ledger. This reflects the fact that the company owns every machine in belief that it is needed for production but has not assessed the actual need. Thus, many machines are kept in recognition that they might as well be disposed when time arrives.
To establish a good maintenance system, each machine should be assessed of its needs and should be maintained according to importance.</td></tr>
<tr><td></td><td></td><td>Guidance record</td><td>65 machines in the ledger were evaluated one by one and were classified into the following three categories.
Rank A: Critical machine (indispensable in production activity and serving as a lifeline for the entire factory)
Rank B: Production machine (essential in production but can be replaced with an alternative machine)
Rank C: Intermittent production machine (kept idling usually and used only to fulfill special orders)
The results of classification are presented below.
<table>
<tr><th>Category</th><th>No. of units</th><th>Percentage share</th></tr>
<tr><td>Rank A</td><td>28</td><td>48.3%</td></tr>
<tr><td>Rank B</td><td>11</td><td>19.0%</td></tr>
</table></td></tr>
</table>

			Rank C: 19 (32.7%) Subtotal: 58 (100%) In addition, seven machines were considered to be subject to disposal, totaling 65 machines.
		Results and evaluation	58 machines should be covered by the maintenance system. 1) At present, the following activities are carried out. a. Provision of operation manuals: While relatively new machines come with manuals, older ones have been lost and should be developed or obtained again. b. Establishment of inspection cycle: Implementation of periodical inspection at various intervals, i.e., daily, weekly, monthly and quarterly. The present inspection cycle should be reviewed and revised according to actual conditions. The inspection cycle should be specified in the applicable manuals. c. Provision of spare parts: Including rotary parts, such as bearings, belts, pulleys, and gears, which are subject to damage. d Lubricants: Standard types of lubricants are specified, together with the amount of storage. The lubrication cycle should be included in □. e. Repairing of lubricating devices: As the factory has a heat treatment furnace, operating conditions are generally severe. Lubricating devices should be repaired as required by spending adequate costs. f. Scheduled repair: In each year, scheduled overhauling should be carried out before actual breakdown, improving economy of maintenance. 2) Energy saving and pollution control The factory generates and consumes large amounts of heat energy. While Argentina has abundant supply of natural gas that is cheaper than other countries, low-cost energy supply is not guaranteed forever. From the viewpoint of energy saving, effective measures to control heat dissipation from the furnace, improvement of combustion efficiency, and optimal use of energy sources (gas, electricity, petroleum, etc.) are called for. Also, air pollution control should be given of priority. For this purpose, proper energy management techniques should be learned.
7	KAIZEN theme-3	(Theme title)	Definition of evaluation criteria for the automation level
		Situation prior to use of guidance	The factory uses various types of automatic machines, led by the full automatic coil winding machine. From the management point of view, definition of evaluation criteria for the automation level is essential.
		Guidance record	1) The automation level is classified into full-automatic, semi-automatic, and manually operated (operation accompanied by worker). While this classification can be applied to all machines, the evaluation results do not have much bearing from the viewpoint of factory management. Rather it is significant for manufacturers. 2) Evaluation in terms of contribution to production This evaluation is based on the ratio of total tonnage of spring steel (or the number of springs) manufactured monthly at this factory to that made by the full automatic coil winding machine. This can be evaluation criteria for the level of

<table>
<tr><td></td><td></td><td></td><td>automation relating to production, from the management point of view.</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>By using the second evaluation method, the present automation level is assessed as follows. (as of November 2005)
<table><tr><th>Category</th><th>No. of piece produced</th><th>Percentage share</th></tr><tr><td>a. Full automatic machine</td><td>22,400</td><td>69.1%</td></tr><tr><td>b. Semi automatic machine</td><td>8,000</td><td>24.7%</td></tr><tr><td>c. Manually operated machine</td><td>2,000</td><td>6.2%</td></tr><tr><td>Total</td><td>32,400</td><td>100%</td></tr></table>
Based on the results, the company's present level of automation is estimated at around 70%. However, as the company makes some products mostly by manual operation, machines in categories b and c cannot be neglected. The target percentage for category a is set at 80%.</td></tr>
<tr><td rowspan="4">8</td><td rowspan="4">KAIZEN theme-4</td><td>（Theme title）</td><td>Upgrading of production technology</td></tr>
<tr><td>Situation prior to use of guidance</td><td>The company employed nearly 50 persons. With this size, it was the time for the company to appoint full-time personnel in charge of production technology.</td></tr>
<tr><td>Guidance record</td><td>As the company's contact person for the study team was the production manager, discussion progressed very smoothly. The study team member explained an outline of the following two manuals, which were expected to contribute to job improvement.
1) Primer to job improvement and innovation
2) Methodology of production technology-related work</td></tr>
<tr><td>Results and evaluation</td><td>It is hoped that, on the basis of explanation on the manuals, the company's responsible personnel will review the current state and find what has lacked (not started yet) or what should be promoted in the future from the fresh point of view.</td></tr>
<tr><td>9.</td><td>Follow-up activities by INTI personnel</td><td colspan="2">Measurement of setup time for the full automatic coil winding machine was repeated and work progressed jointly with Gomez, including identification of problems and development of setup time reduction proposals.</td></tr>
<tr><td>10</td><td>Documents submitted</td><td colspan="2">1) Primer to job improvement and innovation
2) Methodology of production technology-related work
3) JIS B2709-2000 (JSMA/JSA) “Methods for Designing and Performance Testing of Spiral Coil Springs”
4) JIS B2711-2005 (JSMA/JSA) “Shot Peening”
5) Corporate Profiles of Nihon Hatsujou Co., Ltd. (color copy version)</td></tr>
<tr><td>11</td><td>Documents received</td><td colspan="2">1) Organization chart
2) Layout drawings</td></tr>
</table>

12	Guidance activities other than the kaizen themes	1) Field tour at YAS (explained in other section) 2) Joint meeting of model enterprises (explained in other section) 3) Visit and discussion with a company in the same industry On September 20, the company's representatives visited Resortes Argentina S.A.I.C. for factory tour and exchange of opinions. R.A. mainly produced small, lightweight coil springs (near palm size), compared to Aniceto Gomez that made much larger, heavier products (held by both hands). Although no direct comparison was possible, various points in common were found in the area of production technology, especially soft management techniques, together with mutual learning.
13	Comment by the study team member	*Future challenges and goals for the company* - Layout-related problems The factory extensively uses the heat treatment furnace. After the heat treatment process, the shot peening process follows. As the shot peening process must handle products from full automatic machines and semi automatic or manually operated machines, subject to concentrated workloads. As a result, it constitutes a bottleneck and work pieces in waiting are placed around the machine. In principle, another shop peeing machine should be installed to handle products from either automatic or semi-automatic/manually operated machines. This should be included in the medium-term plan. - In the company, personnel perform their own work properly under the leadership of the president. What they need is integrated information management that covers the entire production chain from order receiving to production and sales. At present, information management is handled discretely by each person who owns and is responsible for his or her own work. This seems to cause difficulty in proper inventory control. *Activity to be continued by INTI personnel* 1) Reduction of setup time for the full automatic machine At present, the level of automation is considered to be very high. INTI personnel are thus expected to conduct further research and study in order to develop the ability to provide proper guidance to meet the future needs. 2) Maintenance system The establishment of a proper maintenance system can be applied to a broad range of production facilities. Thus, the kaizen project should not be confined to a single spring factory but its broad applicability should be pursued. 3) Definition of the automation level and evaluation The definition of the automation level constitutes an integral element of soft technology that can be used for evaluation on enterprises. INTI personnel are expected to develop the ability to make effective input in the course of discussion with client enterprises. 4) Upgrading of production technology INTI personnel should read the manuals furnished by the study team carefully so that they can use them effectively for future guidance service.

Table 6.2 Participating Company 2 of Model Project 1　Guidance Record and Result

1	Company visited	KRETZ S. A.		Code No:　Ro-6
2	Total number of visits	14		
3	Study team member who made visit	Teruo Higo	INTI personnel	Raul Castano Gabriel Gorostarzu
4	Personnel representing the visited company	Ing. Daniel Kretz (General Manager) Lic. Marisel Nievas (Manager in charge of marketing)		
5	KAIZEN theme -1	(Theme title)		
		Situation prior to start of guidance	1) For both managers and general employees, there have been few opportunities to discuss "the future road to be taken by the company." As a result, no medium- or long-term plans have been established or implemented with deployment to day-to-day management. 2) The company is in the stage of transforming itself from traditional family operation to modern organizational management. 3) The company's sales grow moderately in recent years with export ratio being around 6%. 4) Employees are relatively young, with the average age of around 30. The company has made efforts for human resource development but not satisfactory. 5) The product line centers on electronic scales and lacks diversity. 6) The company has 60 employees, of which R&D staff is only five. 7) The average turnaround period (from product development to commercialization) is one year and half. 8) So far, product development tasks have been entirely left to the product development department, and neither production nor sales department did not have any voice and their opinion was not reflected	
		Guidance record	1) Guidance included the formation of the "kaizen team" and proposal of activities by the kaizen team including business management, followed by the holding of a seminar on "the method for management of kaizen project team" for team members. 2) A seminar entitled "New Factory Management – the Factory that can survive in the 21st Century" was held as part of guidance for modern management. 3) A seminar on "project management" was held to teach the method for revitalizing a company, including sales growth and the boosting of the export ratio. 4) Four seminars relating to the product development organization and the method for production development wee held as part of human resource development. 5) Guidance for "brainstorming" by the study team to develop ideas relating new products and proposal and guidance for "market study." Proposal and guidance relating to design, specifications and functions of a new product selected in the above process, based on its video presentation and document, along with comments and advice by a JICA/SV designer and introduction of his seminar.	

			6) A seminar on the product development department was conducted with guidance to enhance the product line and consider future product development. 7) A seminar on the product development department was held to teach the need for quick development in order to compete with competing products, especially low-cost Chinese products. 8) Guidance and proposal was made to establish a joint development and production system participated by related developments in order to develop, jointly with the kaizen team, a new product on the basis of mutual understanding of needs and interest.
		Result and evaluation	1) The “kaizen team” consists of members representing management, product development, marketing, sales, after-sales service, production, procurement, finance and accounting 2) As a result of the guidance and kaizen, an organization with commitment was established to create and execute new types of operation and management, such as the establishment of a 24x7 after-sales service system, periodical client visit, and production of a corporate promotion video production in English and Spanish. 3) Annual sales grew at 52% in 2005 and 30% (forecast) in 2006 (new products are expected to contribute). The export ratio is expected to grow from 6% in 2005 to 10% in 2006. Main factors are productivity improvement (approx. 20%) and the shortening of delivery schedule (20%). Seminar participants averaged at around 25 and asked high levels of questions in terms of quality and quantity, and their efforts successfully developed into companywide revitalization and voluntary kaizen activities. 4) 42 ideas were selected and narrowed down to 15, resulting the short list of two ideas, and one was finally selected. As a result, a “price authentication device”- for the first time in Argentina – was born. For commercialization of the device, the Argentina Technology Fund (FONTAR: organization under the Academic, Technology, and Production Innovation Agency) has decided to provide loans. 5) At present the number of employees increased to 75 (25% increase), with development staff being increased to 8 (60% increase). 6) Previously, the company’s turnaround period (from product development to commercialization) was 18 months. For the device, the turnaround period was shortened to around 10 months (50% less). 7) Through discussion in the kaizen team that represents related departments, an initiation and action system was established.
6	KAIZEN theme –2	(Theme title)	Introduction of the adequate inventory management method
		Situation prior to start of guidance	1) There was the need for improvement of inventory management. 2) Warehouse layout was partially inadequate and there were some problems relating to containers for electronic parts and circuit boards. 3) The company was in the process of introducing a computer software system for production management, but input information was not known
		Guidance record	1) Guidance 1) – 3) for kaizen them 1 was made simultaneously to a pair of kaizen teams. 2) Proposal of a new layout with better work efficiency and guidance for improvement of containers for electronic parts and circuit boards (including introduction of related suppliers). 3) Advice and comment on the advantage of promotion of the “kaizen activity” that would clarify information needed for

			implementation of the SAP system.
		Results and evaluation	1) After introduction of 5S, improvement of a carton delivery system and the provision of a warehouse area of 100m2 (warehouse 70m2 + mezzanine space 30m2) were achieved. In 2006, inventory will be reduced to 1.5 months for raw materials and 0.5 month for finished products as SAP starts up. 2) As a result of modification of the warehouse layout, introduction of a wireless bar code reader system, use of kanban, and improvement of containers for electrical parts and circuit boards, time required for finding parts decreased by around 20%. (The number of units shipped per warehouse person increased from 2,500 per month to 3,000. 3) As a result of the kaizen activity, information and data input could be easily added for implementation of the SAP system.
9.	Follow-up activity by INTI personnel		
10	Documents submitted	1) Method for promoting product development 2) Product development process 3) Product planning statement 4) Product concept sheet 5) Desirable role of the product development department 6) Method for managing the kaizen project team 7) “Operation Akafuda/kanban” 8) Kaizen suggestion system 9) “New Factory Management – the Factory that can survive in the 21st Century” 10) Six sigma 11) “How to motivate an idle employee to take his work seriously”	
11	Documents received	1) Progress report on “inventory improvement” by the kaizen team 2) PROYECTO KAIZEN DESARROLLO DE PRODUCTO 3) PROYECTO KAIZEN GESTION DE STOCK 4) CONVENIO DE ASESORAMIENTO TECNOLOGICO	
12	Guidance activities other than KAIZEN themes	1) Introduction of JICA/SV designers and seminars 2) Video presentation and commentary: “Method Study and Work Engineering” and “Production Control” 3) Video presentation and commentary: “Winning Factories” (from Japanese TV series, “Gaia no Yoake“) 4) Introduction and guidance for the cell production system	
13	Comments by the study team member	***Future challenges and goals for the company*** - Development of new products after “the price authentication device,” such as the scales with a body fat checker (reexamination of 41 ideas proposed) - Introduction of 5S to facilities other than the warehouse, such as an assembly line or service shop - Introduction of the cell production system (essential for volume production of the price authentication device that will be launched in March 2006) ***Items to be followed up by INTI personnel***	

		- Support and follow-up activities in the above three items

Table 6.3 Participating Company 3 of Model Project 1　Guidance Record and Result

1	Company visited	FUNDICION GATTI S.R.L.		Code No: Ro-9
2	Total number of visits	9		
3	Study team member who made visit	Nobushige Fukase	INTI Personnel	Ing. Raúl Castaño
4	Personnel representing the visited company	Norberto L. B. Gatti　Director General C.P.M. Antonela Gatti　Staff de Gerencia C.P.M. Marcos I. Meneghetti　Staff de Gerencia		
5	KAIZEN theme-1	(Theme title)	Reduction of rejection rate	
		Situation prior to use of guidance	The company is specialized in foundry to manufacture various types of gray iron and nodular graphite cast iron products used by the agricultural machinery and automobile industries, using a high pressure casting line. Partly due to the aging of the casting sand control equipment, the company's total rejection rate reached 3%, consisting of the internal rejection rate of 2% and the return rate from customers of 1%. Daily production data, such as casting data and the number of defects, were stored in the computer, but data were not effectively utilized, such as data analysis and the planning of the subsequent action. Thus, the kaizen project was planned to start with the basics of quality control with an ultimate goal to reduce the rejection rate to two thirds or less the present level.	
		Guidance record	1. Although daily production records including casting and defect were maintained, no action, such as data compilation by month and year, macro-analysis, and formulation of corrective measures, was taken. It was then advised to analyze melting, casting, production and defect records as well as causes for defects relating to the entire factory in FY2004, plot the results on tables and graphs. In particular, it was instructed to perform data sorting, compilation and analysis by using quality control techniques such as Pareto chart. 2. To organize a small group for each shop or division of the factory and to conduct 5S and the defect reduction activity. An emphasis was made to teach the objective of small group activity – to raise interest of employees in quality – and to train group leaders. 3. The method to promote defect control measures by the small group was taught. It was proposed to hold meetings according to the following schedule and objective and make the minutes of meeting. 1) Beginning of each month: To analyze defect data in the previous month and devise corrective measures. 2) Mid-month: To check the status of progress. 3) When a sudden quality problem occurs: To convene related personnel for devising and initiating emergency measures.	

<table>
<tr><td></td><td></td><td></td><td>4. As for the QC7 Tool, its use was taught in the form of OJT as required, instead of lecture.
* Graphs showing causes for defects in 2004 were presented, and it was advised to prepare Pareto charts. Various QC techniques such as stratified analysis and correlation diagrams were taught.

5. To sum up the kaizen theme, responsible mangers and kaizen team members attended at the workshop that was held in December 9, 2005, for managers and kaizen team members of model enterprises in Rafaela, using textbooks “Promotion of Quality Control at Foundries” and “Method for Experimental Planning” (Spanish version).</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>In February, the kaizen group was organized and the defect reduction activity was officially launched. Average achievements between January and October are summarized below.

<table><tr><td></td><td>Mortality due to casting defect</td><td>Reduction rate of mortality</td></tr><tr><td>Average for 2004</td><td>5.41 %</td><td></td></tr><tr><td>Average for January – October 2005</td><td>4.03 %</td><td>25.5 %</td></tr></table>
As a result of the defect reduction activity targeting products for John Deere, the rejection rate was down 25.5%, close to the target level (two thirds).</td></tr>
<tr><td>6</td><td>KAIZEN theme-2,3</td><td>（Theme title）</td><td>Facilitation of startup of new green sand mixing equipment and early establishment of work standards (documentation)</td></tr>
<tr><td></td><td></td><td>Situation prior to use of guidance</td><td>The casting sand processing equipment was aged and sand was frequently spilled in the shop, resulting in the poor working environment. The company realized the situation and ordered new equipment to a Brazilian manufacturer, which was scheduled to be installed in around June.</td></tr>
<tr><td></td><td></td><td>Guidance record</td><td>1) To prepare work standards according to the startup of equipment.
2) To prepare control charts on sand’s CB value and resistant pressure when the casting sand mixing equipment starts, and to control the sand mixing process.</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>Installation of the casting sand mixing equipment was delayed and the startup was postponed until October.
The equipment had automatic control functions to replace manual work based on skilled workers’ experience and intuition. Personnel of the Brazilian manufacturer taught the operation method as supervisor and work standards were established. It was advised to manage the equipment operation using the control chart presented in the December 9 lecture on “Promotion of Quality Control at Foundries.”</td></tr>
<tr><td>7</td><td>KAIZEN theme-4</td><td>（Theme title）</td><td>Organization of shop-based small groups to promote 5S activity</td></tr>
</table>

		Situation prior to use of guidance	Patterns used in the foundry were maintained very well by using large stacks at the entrance to the foundry. Orderly arrangement and storage can be a model for other companies. However, dirt on the floor due to sand and disorderly arrangement of articles were visible in the interior, suggesting the need for 5S activity that is the basic of factory management.
		Guidance record	As INTI Rosario had abundant experience in field guidance for 5S activity, INTI staff took a lead in teaching 5S. 1) Eight kaizen groups were organized and each group held weekly meetings on 5S. 2) Questionnaire survey (using a two-page form) was conducted for each group to check awareness of and knowledge on 5S. It was advised to conduct the same survey after the end of the project and check the difference from responses in the previous survey. 3) "Operation Akafuda" was conducted and disused/unwanted articles were discarded. 4) The kaizen activity was started with proper disposal of garbage by installing garbage boxes in each block. 5) It was advised to photograph field conditions before and after 5S and to estimate the value of benefits where possible. 6) It was advised to raise companywide awareness of employees by installing 5S bulletin boards and posting a layout map showing territories of small groups as well as photos of areas where 5S activity has produced measurable results. 7) Field inspection revealed that sand stuck to forklifts' tires because of puddles on the service path outside the building and contaminated the foundry floor, and it was advised to the president to clean puddles immediately. It was emphasized that the situation could adversely affect workers' motivation to promote 5S further, which was still in the nascent stage. Also, important roles of management, engineers and supervisors were explained, i.e., to create and maintain the work environment that facilitates everyday work (management); to design and make dies, patterns and jigs that are easy to use (engineers); and to provide proper and continuous training for workers (field supervisors).
		Results and evaluation	1. Puddles outside the foundry were cleaned up promptly and forklifts' tires were clear of sand. Management's positive attitude seemed to affect employees and 5S took effect. The housekeeping in the foundry was improved every visit. 2. The company also disposed unused articles and equipment kept outside the foundry, and an open space of 720m2 was created and 141 tons of scrap metals were sold to earn 34,000 pesos, as of the end of November. Examples of 5S activity results are shown in Appendix 1.
8	KAIZEN theme -4	(Theme title)	Reduction of customer (John Deere) complaint (PPM)
		Situation prior to use of guidance	Since September 2004, the company has been receiving from John Deere – customer of casting parts for agricultural machinery - a monthly equality and delivery evaluation report (PPM). However, the company kept the PPM report for recent four months, and early reports were discarded after review. For this kaizen theme, it was decided to focus on reduction of the rejection rate of products delivered to John Deere as a model case for defect control measures.

<table>
<tr><td></td><td></td><td>Guidance record</td><td>1) To keep John Deere's PPM reports and show them to the field guidance team on its visit.
2) To analyze products returned from John Deere, identify causes, and prepare an analysis report and a Pareto chart, different from those covering internal rejection.
3) To conduct the PPM reduction activity in the same manner as advised for defect reduction activity under Kaizen Them 1 – Reduction of the rejection rate.
It was thus advised to compile monthly results in 2005 and hold discussion on each month's results to devise corrective measures, in particular:
1) To perform comparative analysis with results in 2004 and the previous month to find trends (effect of corrective measures); and
2) To investigate causes for returned products and plot them on a Pareto chart.</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>n February, the kaizen group was organized and the defect reduction activity was officially launched. Average achievements between January and October are summarized below.
<table><tr><td></td><td>Return rate due to casting defect</td><td>Reduction rate of return</td></tr><tr><td>Average for 2004</td><td>4.74%</td><td></td></tr><tr><td>Average for January – October</td><td>3.29%</td><td>30.6%</td></tr></table>As a result of the defect reduction activity, the return rate dropped 30.6%, almost reaching the target level (two thirds).
Appendix 2 shows changes in the return rate.</td></tr>
<tr><td>9.</td><td>Follow-up activity by INTI staff</td><td colspan="2">Although the company was located in a remote area near Rafaela, approximately 200km from Rosario, INTI staff visited it frequently and sent useful information to Japan by e-mail. It was a great job. Guidance and advice on 5S was led by INTI staff.</td></tr>
<tr><td>10</td><td>Documents submitted</td><td colspan="2">1) Casting record and defect cause analysis tables
2) Sample of QC flowchart and QC flow sheet for foundry
3) Promotion of quality control within the company (Spanish version, for seminar)
4) Kaizen suggestion system (Spanish version)
5) Promotion of quality control within the company (part 2) (Spanish version, for workshop)
6) Documents on QC 7 Tools in Spanish (one copy from INTI)
7) Summary of the fourth field survey results (Spanish version)
8) PC document on small group activities and revitalization of companies (Spanish version)
9) Promotion of quality control at foundry (Spanish version)
10) Experimental planning method (Spanish version)</td></tr>
<tr><td>11</td><td>Documents</td><td colspan="2">1) Organization to promote the INTI-JICA Kaizen project and scope of work
2) Sample of "akafuda" used for "Operation Akafuda"</td></tr>
</table>

	received	3) Melting, casting, production and defect records, defect cause analysis tables and graphs for the entire factory in FY2004 4) Casting, shipment and return records on John Deere-destined products, defect cause analysis tables and graphs in FY2004 5) Copies of quality evaluation (PPM) reports from John Deere 6) Monthly melting, casting, production and defect records for the entire factory in FY2004 7) Monthly melting, casting, production and defect records on John Deere-destined products in FY2004 8) Sample report on measures to prevent recurrence of quality defects 9) PowerPoint document on current status reports on progress of kaizen themes 10) Documents presented at the December 5 seminar and CD storing them
12	Guidance activities other than the kaizen theme	The company is also actively engaged in equipment improvement, such as introduction of casting sand processing equipment and a non-frame molding line, and information relating to casting equipment and its operation, as learned by the study team expert, has been provided for reference.
13	Comment by the study team member	***Future issues and goals for the company*** - The quality control technique and concept that the company has learned through the activity to reduce the return rate of John Deere-destined products should be deployed to products from the entire foundry. - It is hoped that the company will carry out proper quality control by using new green sand processing equipment and control charts. ***Items to be taken over by INTI staff*** - INTI is expected to follow up the project to ensure that the quality control system and technique that the company has learned through the project will become established in the country. - As the company is expected to develop further if its management technology is upgraded, it is desirable that INTI will provide support in the area of management technology, in addition to quality control.

Appendix 1 Results of 5S Activity

Left: Before start of 5S activity

Right: During implementation of 5S activity :

Below: Results of 5S activity outside the foundry

Appendix 2 Changes in the Rate of Return from the Major Customer, John Deere,

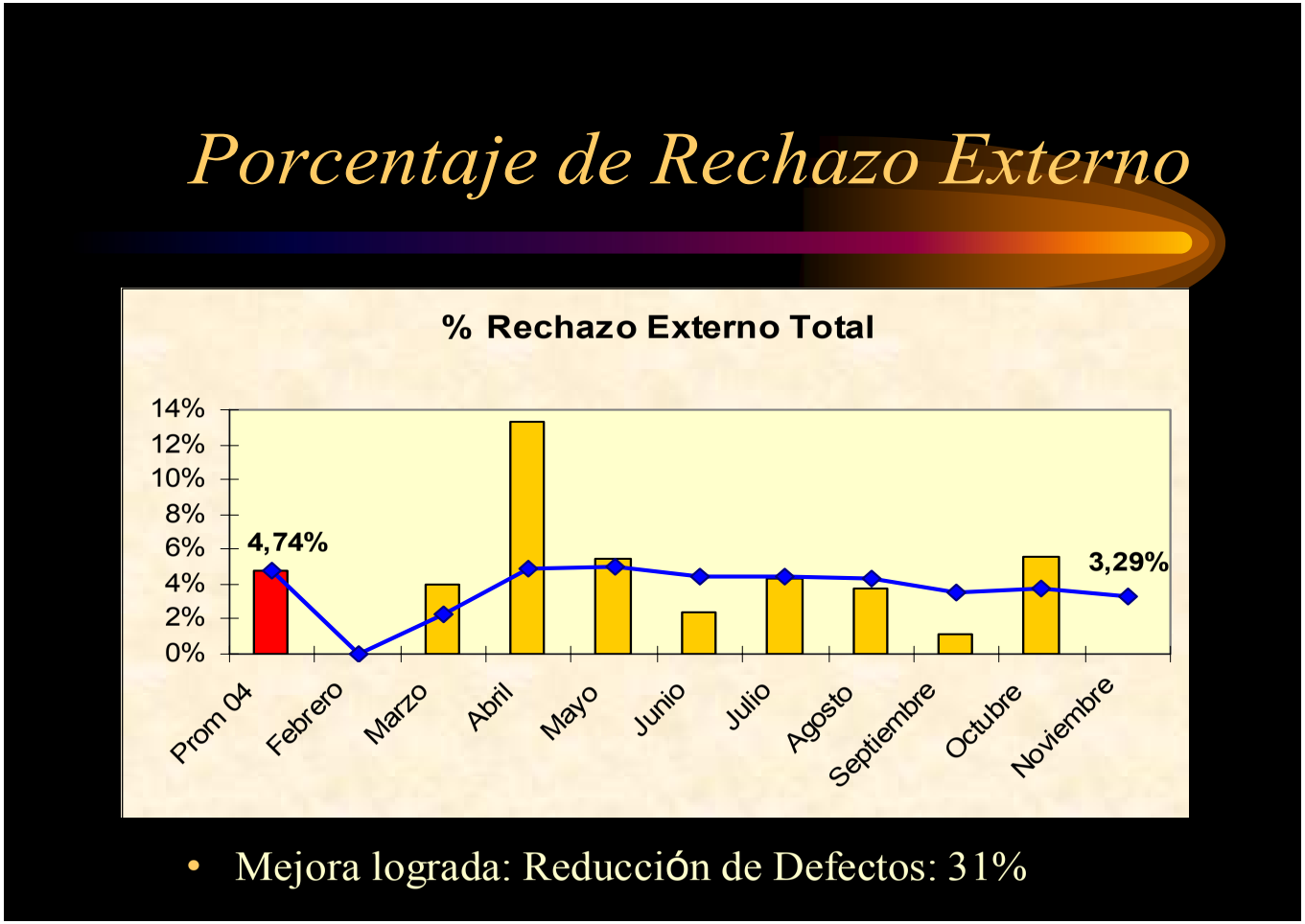


Table 6.4 Participating Company 4 of Model Project 1　Guidance Record and Result

1	Company visited	TOPLINE Engineering Argentina S.A.		Code No.:　Rf-5
2	Total Number of visits	11		
3	Study team member who made visit	Nobushige Fukase	INTI Personnel	Ing. Gustavo Valfre、 Tco. Bruno Bonino
4	Personnel representing the visited company	Nestor Omar Alberto　Vice Presidente Lic Andrea Marconetti　Responsable Produccion y Gestion de La Calidad Leonardo Landazuri　Gestion de La Calidad Producto Rasteerri Daniel　Control y Proceso de Datos Eliana　Produccion　Gestion de La Calidad		
5	KAIZEN theme-1	(Theme title)	Initiative by small group activity for 50% reduction of the rejection rate	
		Situation prior to start of guidance	The company manufactures aluminum alloy, cylinder heads for automotive aftermarket, both domestic and international, i.e., its products are exported to EU and neighboring countries.　Its rejection rate (scrap rate) within the factory ranged between 10% and 12%, of which 8% - 10% were said to be caused by defects in casting materials.　As the company set forth reduction of the rejection rate (scrap rate) as one of its challenges in 2005, it was decided to create an inter-department kaizen group, promote quality control at the foundry, and to conduct activities for 50% reduction of the scrap rate. Although the company's factory collected a variety of data and recorded them on computer, no analysis was made and data were not effectively utilized for quality improvement.	
		Guidance record	1) Guidance was given for the data compilation method, preparation procedures for minutes of meeting, concept of stratification, and the method to utilize Pareto charts, on the basis of past casting data, including acceptance and rejection rates, and results of defect analysis. *Data compilation method 1-1) Causes for defect were overly subdivided to prevent identification of a general picture.　It was advised to construct a Pareto chart to show an overall picture and perform detailed analysis of major causes. 1-2) It was recommended to calculate the average rates of rejection and fixing – consistent indicators - to allow comparison with those in the previous year. *Procedures for preparation of minutes of meeting 1-1) To make the minutes of meeting for each meeting, including actions to be taken, responsible personnel, and date of implementation. 1-2) To hold the meeting and make the minutes of meeting according to the following schedule and principle: (1) At the beginning of each month: To analyze defect data in the previous month and examine corrective measures. (2) Mid-month: To check the progress status.	

			(3) When an anomalous quality problem or condition occurs: To convene stakeholders for each occurrence and hold a meeting to devise corrective measures. *Stratification 1-1) Monthly rejection rates varied greatly. It was point out that there was a need for stratification of data on new and present products for better data compilation. 1-2) In last August, inspection standards were raised to Rank A for EU-bound exports and the fixing rate increased. To reflect the change, it was advised to stratify relevant data before and after last August. (Rank A - applicable to EU-bound exports; Rank B – local assembly manufacturers; Rank C – local aftermarket) 1-3) Similarly, mortality data in received documents showed variation for the same month. As a result, data coverage was narrowed from all products to the principal product, i.e., cylinder heads. In the future, it was proposed to promote activities focusing on cylinder heads. *As for monitoring of effectiveness, it was recommended to examine the possibility of monitoring the reduction of failure cost (F-Cost) in monetary terms, in addition to reduction of rejection and fixing rates (unit based), although it was not realized seemingly due to technical difficulty. 2) As for the seven QC tools, their use was taught on an as-required, OJT basis, instead of lecture. *The company submitted graphs presenting a general summary of causes for defect in 2004, and the guidance team recommended that the graphs be recompiled to Pareto charts. Also it taught QC techniques such as stratification and correlation diagrams. 3) For defect samples collected, a meeting was held to analyze their causes and devise corrective measures. *Management should create a good working environment, engineers should design and make molds and jigs that are easy to use, and production managers in charge of production processes should be actively involved in worker training. These activities, when conducted in concert, will produce an intended effect. 4) On December 9, 2005, a workshop was held under attendance of managers and kaizen group members to summarize the guidance activity on the basis of documents in Spanish, entitled “How to Promote Quality Control at Foundry” and “Experimental Design.”

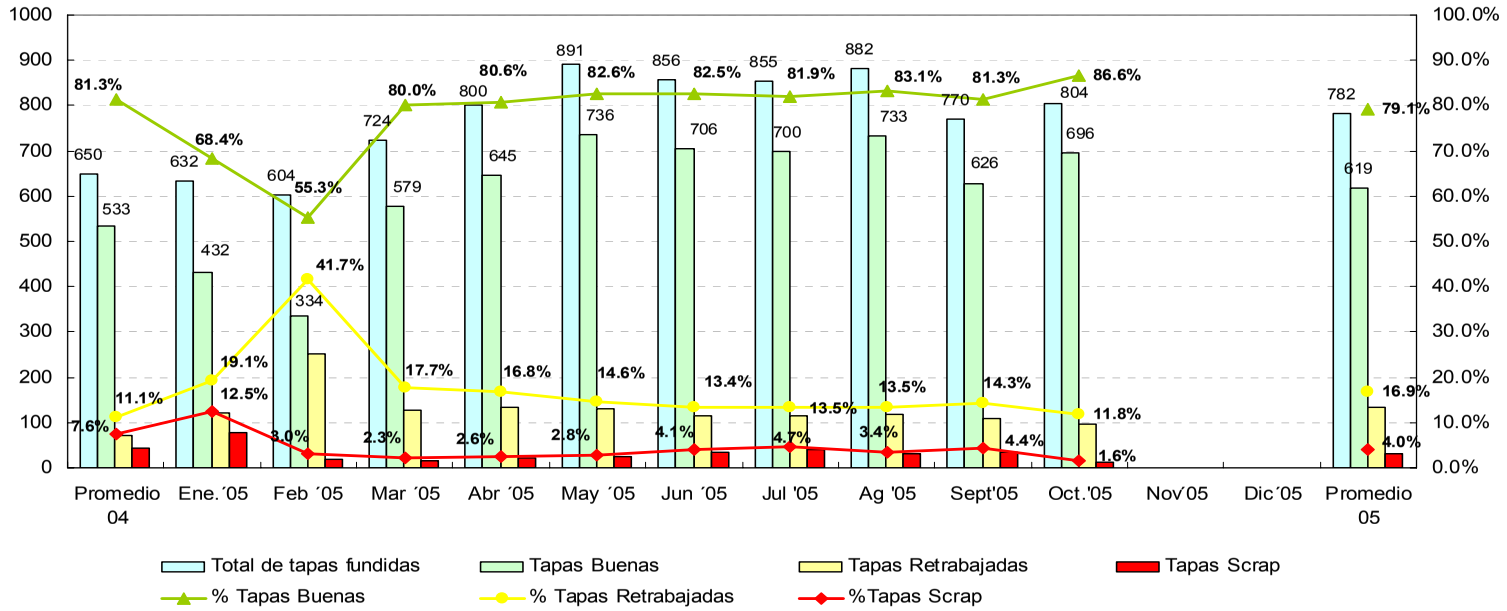
<table>
<tr><td></td><td></td><td>Results and evaluation</td><td>In January and February 2005, various quality problems occurred and performance deteriorated. In February, the kaizen group was organized to launch full-scale defect reduction activities, quality performance improved month after month and the following results were obtained.
Monthly production (ton) Rate of increase in monthly production Mortality due to casting defect (%) Rate of mortality reduction

<table>
<tr><td></td><td>Monthly production (ton)</td><td>Rate of increase in monthly production</td><td>Mortality due to casting defect (%)</td><td>Rate of mortality reduction</td></tr>
<tr><td>Average for 2004</td><td>533</td><td>100</td><td>7.6%</td><td></td></tr>
<tr><td>Average for January-October 2005</td><td>619</td><td>Up 16%</td><td>4.0%</td><td>47.4% reduction</td></tr>
<tr><td>Average for March and October after start of full-scale activity</td><td>678</td><td>Up 27%</td><td>3.3%</td><td>56.6% reduction</td></tr>
</table>
Details of monthly data, including production volume and mortality, are presented in Appendices 1 and 2.</td></tr>
<tr><td>6</td><td>KAIZEN theme -2</td><td>（Theme title）</td><td>Modification of control items and values by using QC flow charts</td></tr>
<tr><td></td><td></td><td>Situation prior to s tart of guidance</td><td>QC flow charts were prepared for the purpose of obtaining ISO9001 certification.</td></tr>
<tr><td></td><td></td><td>Guidance Record</td><td>1) The QC flow chart was subdivided and made for each work group, making it difficult to understand an overall flow of the casting process. It was proposed to make the general flow of the casting process easy to understand by producing a summary flow chart that summarize a general flow for the entire foundry and by attaching flow charts for work groups that are currently available.
2) It was recommended that, if good results are produced from the kaizen group’s activities on defect reduction and quality improvement, related conditions and procedures be considered as new standards and be incorporated into work standards, with the updating of QC flow charts.</td></tr>
<tr><td></td><td></td><td>Results and evaluation</td><td>Documents such as QC and other flow charts are made available when required, such as to obtain ISO9001 certification, but they are left unused in many cases. However, the company has been updating these documents when necessary to maintain usable manuals.</td></tr>
<tr><td>7</td><td>KAIZEN theme -3</td><td>（Theme title）</td><td>Modification of work standards</td></tr>
<tr><td></td><td></td><td>Situation prior to s tart of guidance</td><td>Work standards were prepared for the purpose of obtaining ISO9001 certification.</td></tr>
</table>

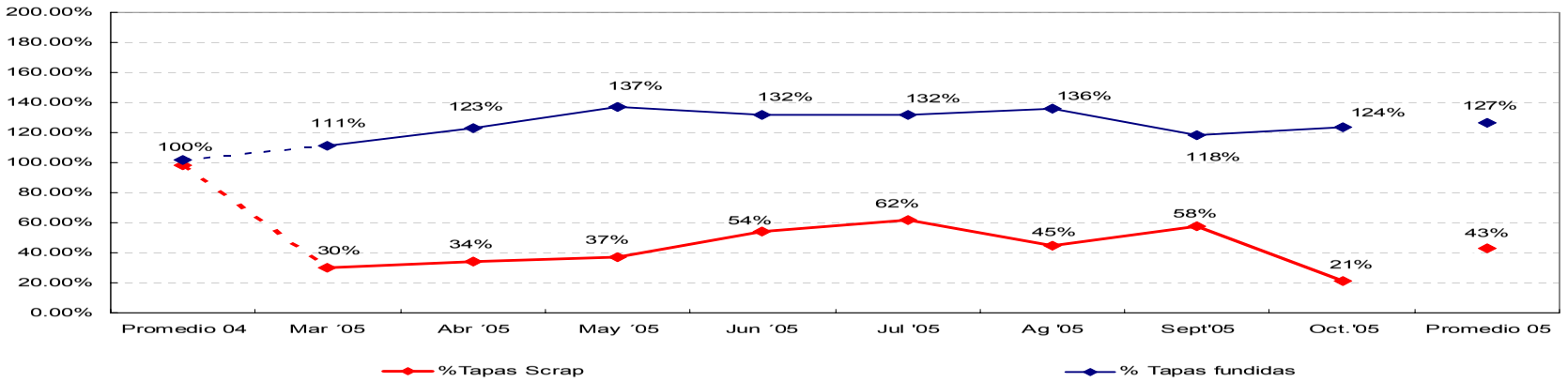
		Guidance Record	1) It was proposed to add photos and sketches to work procedures, while producing brochures covering relevant checkpoints and posting them within the factory. 2) It was recommended that, if good results are produced from the kaizen group's activities on defect reduction and quality improvement, related conditions and procedures be considered as new standards and be incorporated into work standards
		Results and evaluation	Work standards and related documents are made available when required, such as to obtain ISO9001 certification, but they are left unused in many cases. However, the company has been updating these documents when necessary to maintain usable manuals.
8.	Follow-up by INTI staff	The company and INTI's staff maintain good communication and INTI has been conducting appropriate follow-up activity while the JICA expert was not absent. In particular, INTI's follow-up activity is highly effective in preparation of documents for the seminar presenting activity results achieved by model project companies.	
9	Documents submitted	1) Casting record and defect analysis charts 2) Sample flow chart and QC flow sheet for foundry (English version) 3) How to promote quality control within the company (Spanish version for the seminar) 4) What is the kaizen suggestion system? (Spanish version) 5) How to promote quality control within the company (Part 2) (Spanish version for the seminar) 6) Summary of fourth field survey results (Spanish version) 7) Texts on small group activity and company's revitalization (Spanish version) for PC storage 8) How to promote quality control at the foundry (Spanish version) 9) Experimental design method (Spanish version)	
11	Documents received	1) Organizational chart relating to promotion of INTI-JICA kaizen project 2) Documents showing the number of castings made, production volume, the number of products relinquished or fixed, mortality and fixing rate, Pareto charts for cause analysis of defect and relinquishment, between August and December 2004 3) Documents showing the number of castings made, production volume, the number of products relinquished or fixed, mortality and fixing rate, Pareto charts for cause analysis of defect and relinquishment, between January – August 2005 4) Sample meeting records including the minutes of meeting for the quality examination meeting (English version) 5) List of production and defect relating to cylinder heads between January and December 2004 6) Results of defect analysis relating to model PG for key products, minutes of meeting for discussion on corrective measures, and progress report on implementation of corrective measures (Spanish version) 7) Document on research and study on correlations between the order of casting and the occurrence of inclusion 8) Documents presented at the December 5 seminar and a CD storing them	
12	Guidance activities other than KAIZEN themes	The company hired an expert in aluminum alloy casting as a consultant and had high levels of engineering technology. On the other hand, the company seemed to have weakness in production management technology, it was therefore advised to learn production management technology to allow both technologies to serve as "two wheels" to drive the company's growth.	

13	Comment by the study team member	***Future challenges and goals for the company*** - It is hoped that the inter-department kaizen group activity will be maintained and further efforts will be made to reduce the scrap rate (mortality). - In the future, the company should work with reduction of the fixing rate. ***Items to be followed up by INTI personnel*** - INTI is expected to ensure that the quality control system and techniques learned through the project take root in the company. - As the company is expected to develop further by strengthening its production management technology, INTI's support in the area, in addition to quality control, should be provided.

Appendix 1 Monthly Changes in Casting Quantity, Acceptance Rate, and Mortality

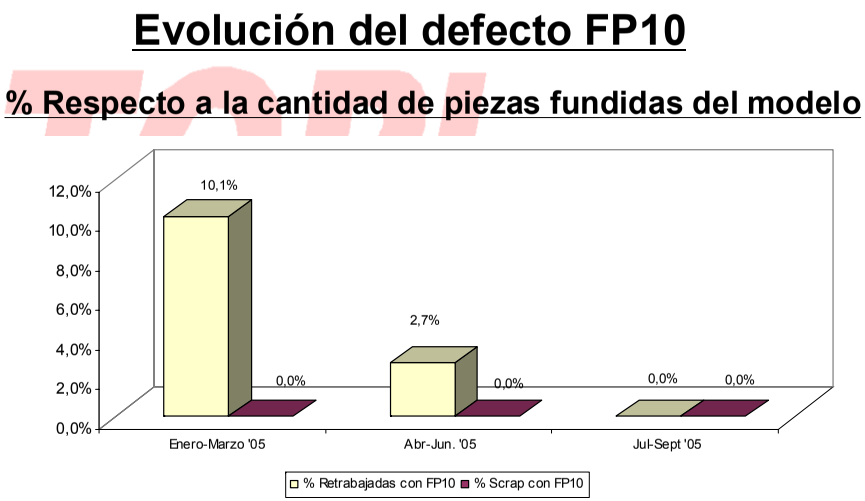


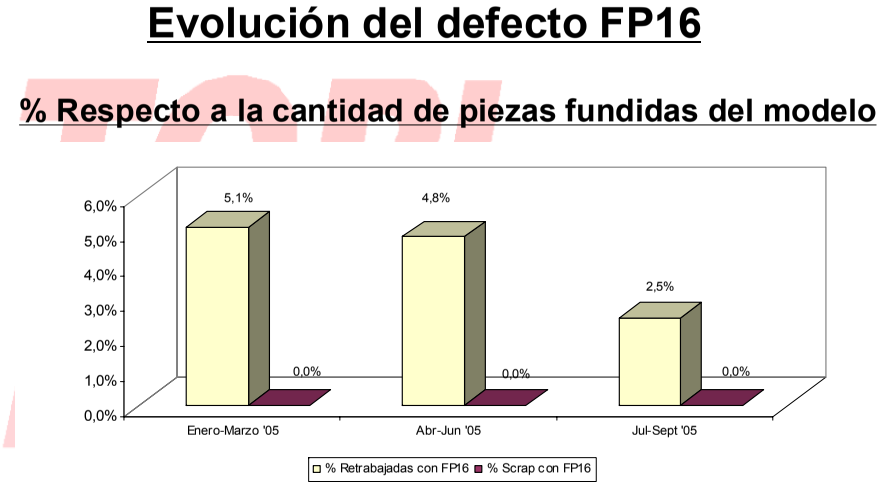
Appendix 2 Rates of Production Increase and Decrease in Mortality after March, When KAIZEN Activity Was Fully Started



Appendix 3 Graphs Evaluating Corrective Measures for Defects Conducted for "Model A" for which Defects (Fixing) Occurred Frequently in February

As porosity occurred frequently in this "model A," particularly concentrated in two areas "FP10" and "FP16," intensive measures were taken to correct them. As a result, the corrective measures produced good results, i.e., the incidence of porosity decreased, as shown below. Operating conditions as a result of the kaizen project were adopted as a new standard, and the QC flow chart and the work standard were revised accordingly.





Porosity that occurred in "FP10" decreased as result of corrective measures, as follows:
Average defective percentage (fixing rate) between January and March: 10.1%
Average defective percentage (fixing rate) between April and June: 2.7%
Average defective percentage (fixing rate) between July and September: 0.0%

Porosity that occurred in "FP16" decreased as result of corrective measures, as follows:
Average defective percentage (fixing rate) between January and March: 5.1%
Average defective percentage (fixing rate) between April and June: 4.8%
Average defective percentage (fixing rate) between July and September: 2.5%

Table 6.5 Participating Company 5 of Model Project 1　Guidance Record and Result

1	Company visited	RUBOL			Code No.: Co-1
2	Total number of visits	14			
3	Study team member who made visit	Rinji Wakamatsu		INTI personnel	Juan Pablo Pretel
4	Personnel representing the visited company	Silvio Bologna (vice president、 Luise A. Bruno（in charge of KAIZEN activity)			
5	KAIZEN theme-1	（Theme title）	Management policy (short- and long-term)		
		Situation prior to use of guidance	Corporate vision was not clear.		
		Guidance record	“Management policy” as the foundation of the company’s operation should be clearly stated and a corporate slogan to unify all employees should be established.		
		Results and evaluation	The corporate slogan was set as follows: “**Incessant Improvement Aiming for Quality, Delivery Schedule and Cost that Exceed the Customer’s Expectation**” This year, a special bonus (fixed amount) was paid to all employees, in addition to regular bonus, in order to distribute profits. The company’s good performance was partly due to the improvement of the overall economy and partly due to successful implementation of kaizen activities under concerted efforts of employees, which produced significant benefits. It is therefore an outstanding result that should be highly praised.		
6	KAIZEN theme-2,3	（Theme title）	Small group activities and the kaizen suggestion system (Theme 2 and 3 combined as they were implemented simultaneously)		
		Situation prior to use of guidance	Six small groups were organized and held weekly meeting (starting at 6:00a.m.), and the president attended at 12 meetings (twice x six groups). Recently, the number was reduced to five and the president attendance totaled 30 times (six times x five groups). At these meetings, general operational matters and management policy were presented, together with discussion on kaizen suggestions and determination of the implementation method.		
		Guidance record	1) Small group activity: Not many companies provide direct discussion with the president. It was recommended to continue it, although it may become difficult if the activities grow. 2) Kaizen (result report) suggestion system: The suggestion system was centered on allocation of the kaizen project budget and the monitoring of actual results, and there was no award system. To further energize kaizen initiatives and their quality, it was recommended to introduce the award system, especially the “kaizen report” system. The system merits measurable results after completion of each kaizen activity and has advantages in that fair evaluation is feasible and workers are encouraged to suggest a kaizen project that can be implemented by themselves, resulting in the increase in “small kaizen cases” that do not require cost or man-hour, while helping workers to improve the “eyes for the field.” The reward system does not need to be introduced immediately, but it may start with a small prize or a “point		

			system" by taking into account the actual number of cases and their content. 3) Reemployment of retirees: The kaizen group needs technical staff who can demonstrate an example of kaizen suggestion and coordinates examination and evaluation of actual kaizen ideas. Preferably, they should be experienced engineers or technicians. As the company has engineers close to retirement or who have recently retired, who seem to be qualified for the task of technical stuff, it has been recommended to hire two of them. They will be responsible for evaluation of suggestions made by employees and work coordination required to implement approved suggestions, such as arrangement for design and other tasks. It should be noted, however, that engineers neglect "small kaizen" in □ above, so that is desirable to encourage kaizen suggestion with the message that "let's start with small kaizen under full participation….."
		Results and evaluation	1) Small group activity and field patrol: The company implements suggestion and kaizen activities as part of small group activity and should timely take action to step up these activities and/or change their direction. It is admirable that the president has been participating in small group activity at 6:0 a.m., 30 times per year. In the future, however, as the organization grows and is increasingly departmentalized in the future, measures should be taken to keep momentum and management support, such as the appointment of department heads as group leaders. Empowerment seems to be important, and the president can continue to take leadership by assuming somewhat different roles, e.g., to give a speech to employees one or twice per year and to inspect the factory everyday in order to give hearty thanks and encouragement to workers. 2) President's patrol: It was recommended that, during his field patrol, the president focus on potential kaizen points and point out problems, as well as praising workers. And problems should be communicated to responsible supervisors and engineers so that kaizen can be promoted. It is particularly important not to leave a problem unattended. If a problem identified by the president is left as it is, it is no longer considered to be a problem by employees, causing them to neglect or ignore 5S or internal rules. 3) Promotion of kaizen activity: The two engineers, appointed as technical staff, have started to provide advice for kaizen techniques by patrolling the factory and suggesting ideas. As a result, Kaizen Theme 4 "Increasing value added for shipped products," as presented below, was carried out and produced results.
7	KAIZEN theme-4	(Theme title)	Increasing value added for shipped products
		Situation prior to use of guidance	The company was specialized in forging, it was felt that there was little room for cost reduction and job improvement due to low value added.
		Guidance record	To increase value added, the following three kaizen project were proposed. As a result of discussion and evaluation, 2) and 3) were implemented. 1) Cost reduction by center hole grinding: It was proposed that the company would do center hold grinding that would serve as a reference point for the subsequent machining process, thereby to allow the adjusted grinding of center holes on the forging surface in accordance with wear and tear of a forging die as well as reduction of the materials machining cost. However, the company had no intention to do center hole grinding. (It was expected that the company was capable of doing some machining operation, because it had its own die making shop, but it seemed to insist on "specialization on forging." 2) Reduction of forging burr: To reduce the materials cost by thinning and weight saving forging burr on the transmission

			counter gear shaft. 3) Prevention of forging burr: To reduce the materials and machining costs by preventing burr on the differential pinion
		Results and evaluation	2) 3) Activities by the veteran engineer team: The two engineers (technical staff) and assistants successfully modified forging dies and reduced burr significantly at the rate of 200g per piece. Weight reduction equivalent to reduction of burr, which would have otherwise been disposed, resulted in saving of material cost at the rate of $16,000 - $20,000 per month (20 tons x $800 - $1,000) as a result of modification of two dies. This has a high significance for the country where raw materials are difficult to obtain, in terms of not only large cost saving but a large resource saving effect. It is highly valuable in that it can be extended to other products and even other companies.
8	KAIZEN Theme-5	(Theme title)	Reduction of work-in-process and shortening of delivery schedule
		Situation prior to use of guidance	1) Inventory of steel materials: Two months for 33 types of steel materials and delivery schedule for purchased materials for four months 2)Improvement of product flow between processes: Work-in-process is transferred between processes by mainly using large cage-type pallets, at least two units before and after each process. 3) Interruption of the product flow due to outsourcing of heat treatment: Not many products are heat treated, but they are outsourced in bulk to prevent lot size reduction. As work-in-process is piled up at the heat treatment shop as backlog, the manufacturing flow is disturbed to prevent accurate estimation of the completion schedule and necessitate the increase in work-in-process.
		Guidance record	1) Collective purchase of steel materials: Although it was recommended to reduce lot size through collective purchase by local companies, it was not realized as a result of special materials used by the company. 2) Automation of transfer between processes: Between cutting, heating, forging, deburring and other processes, work-in-process is transported in cage pallets and at least eight cages are used for four processes. By moving equipment closer and installing a chute or a conveyor belt for automatic transportation and supply of one piece," the number of cages can be reduced to two, one before the beginning of the four processes and one after them. Thus helps equalize the time between heating and forging, resulting in quality improvement and eliminating the need for reheating. By eliminating the use of cages to transfer work-in-process between processes, the production speed increases and work-in-process decreases by one fourth. As a result, product flow speeds up by four times. Thus, automatic transfer of work-in-process between processes leads to the increase in production speed by more than four times as well as quality improvement through reduction of work-in-process and improvement of temperature control, and other benefits. 3)Disuse of warehouse and internalization of heat treatment: Due to reduction of inventory in the product warehouse and the assortment/disposal of products in custody, formal inventory facilities virtually went out of use, except for the export packing facility (which space was also reduced to one tenth that before the kaizen project). For an available space created, installation of a small heat treatment system was recommended. Recently it has been installed and is currently under trial operation.

		Results and evaluation	1) Reduction of steel product types and inventory: Negotiation with the company's customer, VW, is underway to reduce five types of materials to one type. If this happens, the total number decreases from 33 to 29. Meanwhile, the shortening of the delivery schedule for purchased materials was negotiated and the inventory was reduced from two months to one month. Thus inventory reduction produced significant benefits. 2) Reduction of work-in-process (see the graph showing the actual progress): The inventory-sales ratio (work-in-process/product shipment) for slightly less than one year (January through November 2005) declined from 1.46 months in January to 0.41 months in November, or one fourth the level a year ago. As a result, the production speed between materials delivery, production and shipment increased by 3.6 times. This favorable result mainly came from the fact that a wide variety of kaizen activities – such as the improvement of product flow between processes, reduction of die exchange time, and improvement of pallet and materials transfer – were deployed not only in an area for which the kaizen project was proposed, but to the entire process or factory if believed to be applicable. As a result, product delivery intervals have been shortened from once per month before the start of kaizen activities to once per week at present, or even everyday depending on products. 3) Internalization of heat treatment: As the heat treatment system is expected to come on stream, outside processing is eliminated to allow significant shortening of the delivery schedule and reduction of work-in-process. Note that the internal heat treatment cost per se may be higher than the outsourcing cost because of economies of scale, the overall benefits are much larger if cost saving in physical distribution as well as indirect benefits from reduction of work-in-process due to considerable time (period) saving, elimination of transportation costs, and reduction of administrative costs. Note, however, that the company does not have much experience in heat treatment, and it must pay attention to quality control and ensure quality assurance including the inspection method.
9.	Follow-up activities by INTI staff	None	
10	Documents submitted	None	
11	Documents received	Reference materials relating to the presentation meeting on kaizen results (CD)	
12	Guidance activities other than the above kaizen themes	1) Video presentation on the Toyota system and discussion: It was held for all employees on the three shifts. The discussion focused on job insecurity felt by workers due to rationalization. It was emphasized that "rationalization is essential in responding effectively to market globalization and continuous improvement is conducive to well-being of employees and prosperity of the country and region" and mobilization of their wills and efforts was called for. 2) Field tour to other companies: Four companies gathered at Resortes, observed the progress of kaizen activities, and exchanged information. It was agreed to conduct the tour on a continuous basis in the future 3) Field tour to the company's factory: It was held under leadership of INTI and four companies visited the company' factor for field tour and discussion. They were impressed by the smooth progress of kaizen activities and the kaizen group using retired engineers. 4) Participation in seminars on the Toyota production system and other held in Cordoba (twice) 5) Differentiation: "Quality assurance card for forgings" is now attached to every cage containing products. Improvements that help increase customer satisfaction have been successfully made, including reduction of burr and the outside processing cost (Theme 4 □ and □), and the company intends to promote them vigorously to increase and strengthen the customer's confidence and trust through "differentiation" in terms of quality, price, packing style, and other factors. "Differentiation" is a companywide challenge, not limited to the factory.	

		6) Kaizen drive: To encourage kaizen activities in every shop and group, preparation is underway to make color-coded cards designating kaizen areas and attach them to respective areas.
13	Comment by the study team member	***Futures challenges and targets for the company*** Today, forging technology advances rapidly and forgings are increasingly supplied as “finished products” rather than materials or parts. This owes much to “cold forging” that is rapidly propagating in the industry. In fact, differential gears and related parts - the company’s main products – are increasingly made by the cold forging process and are assembled into cars without further machining. It is therefore recommended to continue efforts to introduce latest technology by monitoring and reading the technology trend accurately.

Appendix Stock Reduction

Periodo	Enero	Febrero	Marzo	Abril	Mayo	Junio	Julio	Agosto	Septiembre	Octubre	Noviembre
en proceso	285498	287907	233301	291293	265141	289037	359991	246903	173813	154567	188569
entregadas	195242	343773	367918	463626	384206	367295	412361	446574	440232	529906	457626
Porcentaje proceso/terminadas	146%	84%	63%	63%	69%	79%	87%	55%	39%	29%	41%
Porcentaje de entrega	94.18%	84.53%	95.83%	96.00%	83.60%	97.33%	99.73%	98.66%	99.00%	99.90%	99.47%

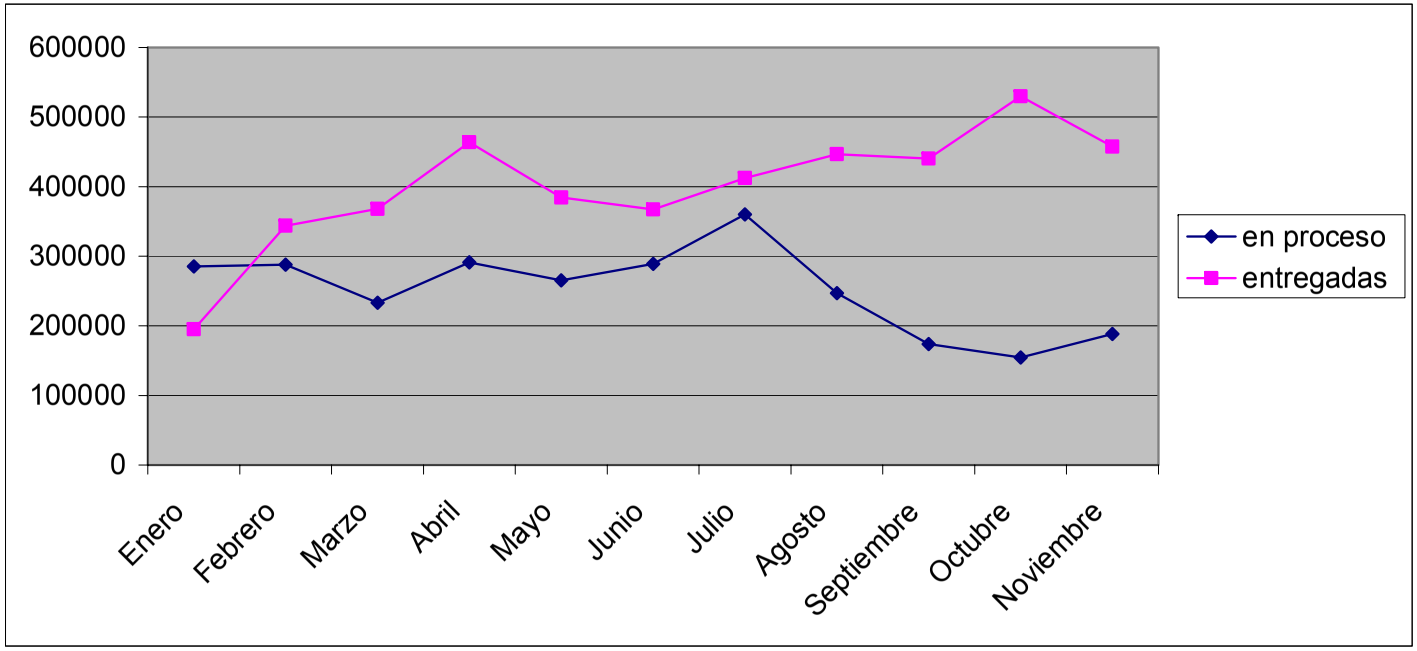


Table 6.6 Participating Company 6 of Model Project 1　Guidance Record and Result

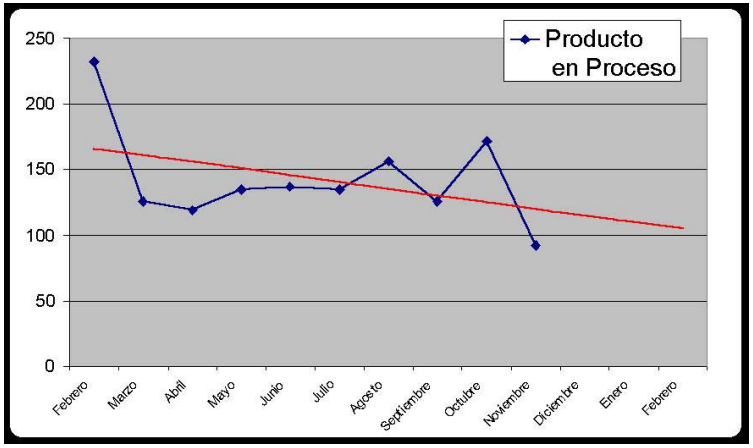
1	Company visited	FAESA			Code No: Co-3
2	Total number of visits	14			
3	Study team member who made visit	Rinji Wakamatsu		INTI personnel	Juan Pablo Pretel
4	Personnel representing the visited company	Director Osvaldo Cassanelli　(President)、Director Alberto B.Cassanelli　(Vice president, HR)、Roberto Cano (technology, quality)、Florencieas Cassanelli　(accounting)			
5	KAIZEN theme-1	(Theme title)	Improvement of setup change		
		Situation prior to use of guidance	As large equipment such as a continuous heating oven was used for cutting, heating, boring, bending and other operations, the lot size was very large in the range of few hundreds and production was carried out with a few setup changes per day. As a result, the lead-time from production order to completion was around 60 days		
		Guidance record	It was advised to reduce the lot size by half several times and double the frequency of setup change twice at an interval of several days (four times the original frequency, while the lot size became one fourth), in order to find bottlenecks in setup change work (based on our experience, reduction of the lot size to one fourth can easily be accomplished without costly improvement).		
		Results and evaluation	Reduction of the lot size progressed smoothly and the work-in-process period was shortened to around 30 days.　As improvement of setup change in the identified bottleneck process was progressed, it was decided to implement the KANBAN system, which was not planned originally and preparation was started		
6	KAIZEN theme-2	(Theme title)	Improvement of the production process (improvement of product flow and implementation of the KANBAN system) (Note that the KANBAN system was added later.)		
		Situation prior to use of guidance	As the lot size was reduced abruptly, improvement setup change and training of all round skilled workers could not catch up and production was delayed.		
		Guidance record	The company requested field guidance for implementation of the KANBAN system, which was not included in the kaizen theme, and specific measures were created and advised.　In particular, it was strong recommended to implement the “make-to-order production system” with an ultimate goal to reduce inventory of a few thousand small-lot parts to zero, thereby to promote inventory reduction of small-lot parts for aftermarket (as much as 3,000 types).		
		Results and evaluation	Initially, introduction of the KANBAN system faced difficulty partly due to time constraint for preparation and doubt arose whether it could be accomplished.　However, the project team made considerable efforts to improve the manufacturing flow and setup change and to master the actual operation of the kanban system.　As a result the system became operational within around two months after start.　Credit for this success should be given to the committed support of management when		

			the initial decision was made or the team faced difficulty, and active involvement of all employees, including product team members who took a lead in mobilizing resources and wills of workers. It is hoped that experience and expertise gained through the project will be directed to achieve another goal, “the make-to-order production system with zero inventory.”
7	KAIZEN theme-3	(Theme title)	Establishment of standard man-hours for each process and monitoring of actual state
		Situation prior to use of guidance	The company believed that process-based man-hour control was impossible for a large number of products (a few thousands including single orders, although a few hundred products were regularly ordered).
		Guidance record	Lot size reduction and introduction of the KANBAN system have facilitated the monitoring of individual product flow. Also, guidance relating to financial accounting has helped improvement of man-hour control. An immediate target is to achieve production management that allows prompt and accurate response on the production or delivery schedule of make-to-order products or customer inquiry. The next stage will aim for the monitoring of actual costs, and analysis of causes for cost variation followed by improvement to promote the overall cost reduction and improve competitiveness.
		Results and evaluation	As efforts were concentrated on the establishment of the KANBAN system, this theme remained in the study stage. It is hoped that specific measures to achieve the goal of the “make-to-order production system with zero inventory” will be developed and implemented.
8	KAIZEN theme-5	(Theme title)	Construction of the quality assurance system
		Situation prior to use of guidance	Control of mill sheets and recording of inspection data, etc, were carried out.
		Guidance record	To minimize waste materials from cutting and reminder materials, detailed control such as comparison of actual waste materials and mill sheets was advised.
		Results and evaluation	Now, the quality assurance system is operated smoothly, except for control of waste materials from cutting.
9.	Follow-up activities by INTI staff		
10	Documents submitted		None
11	Documents received		Reference materials relating to the Cordoba seminar (CD, etc.)
12	Guidance activities other than the above kaizen themes		1) Video presentation on the Toyota system and discussion (all employees on the three shifts): The discussion covered job insecurity due to rationalization. It was emphasized that “rationalization is essential in responding effectively to market globalization and continuous improvement is conducive to well-being of employees and prosperity of the country and region.” 2) Joint field tour: Four companies visited Resortes, observed the current kaizen status and held discussion. It was agreed to conduct the tour on a continuous basis in the future. Later, four companies visited Rubol as the field tour sponsored by INTI for field observation and discussion. 3) Participation in seminars on the Toyota production system and other topics 4) Differentiation: It is a major challenge for not only factory workers but all employees. The concept of differentiation, cases

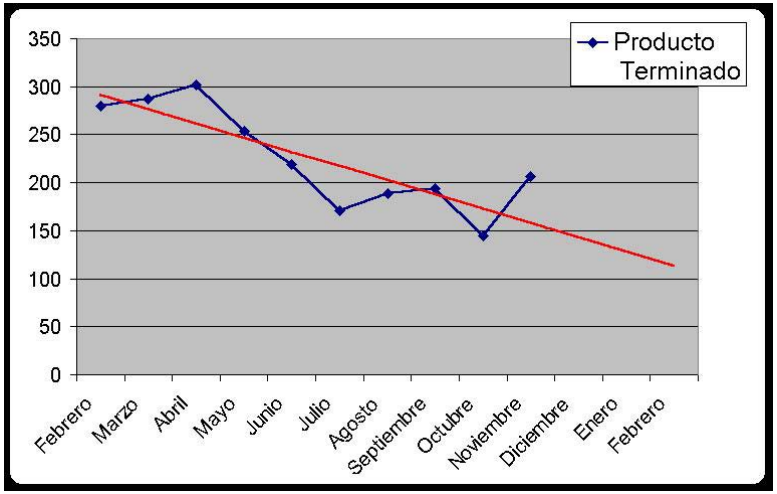
			studies and suggested ideas will be added to the textbook.
13	Comment by the study team member	***Future challenges and goals***	Based on experience and expertise gained from the establishment of the KANBAN system, it is hoped that the company will be able to develop the "make-to-order production system with zero inventory." For instance, although a certain condition needs to be attached initially, such as "the minimum order size of five or more pieces," it is hoped to pursue the "differentiation" policy and develop the ability to appeal sales point of "the minimum order of one piece" around a year after start. As for price setting, unit price may be set according to the order size on the basis of "actual man-hour" based cost calculation. At the same time, efforts should be made to attract customers under the philosophy to aim for sales growth through "differentiation."

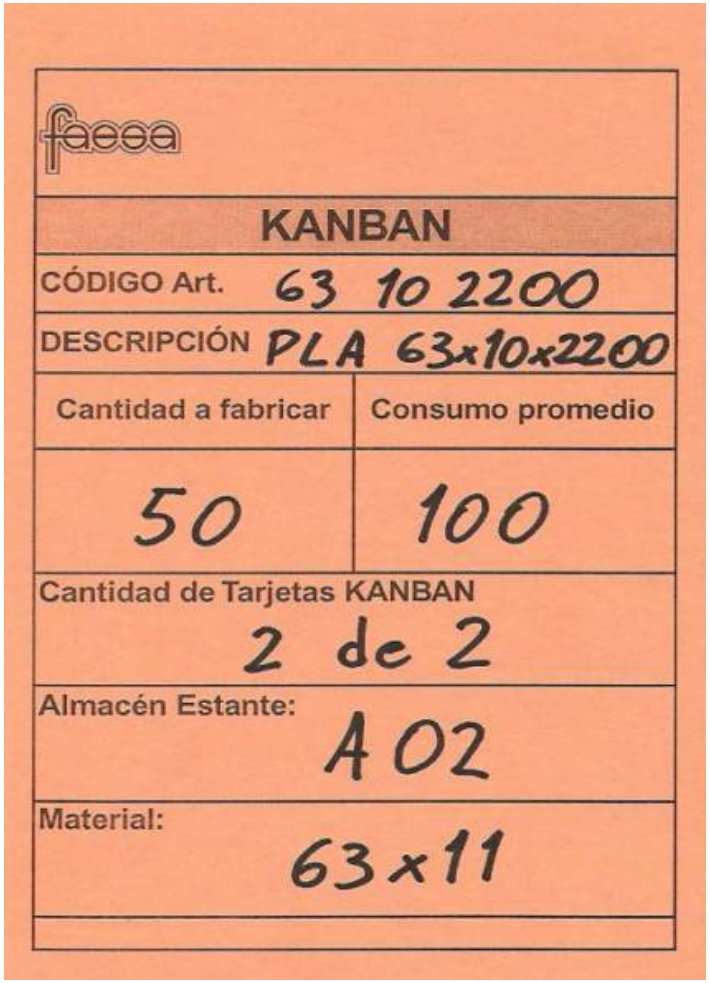
Appendix Stock Reduction and Kanban

Producto en Proceso



Producto Terminando





(2) Radar charts

In the simplified corporate diagnosis, diagnostic items were designed to cover five areas relating to general business management, namely "management," "production," "market and sales," "human resources" and "finance." Furthermore, "production" that was the major subject of the present study was divided into eight sub-items, "quality," "cost," "process," "production technology," "machinery and equipment," "materials, purchase and subcontracting," "inventory" and "production infrastructure." Then each item was evaluated on a five-grade scale. The evaluation criteria was based on the average level of parts manufacturers serving the global OEM markets, which was set at 5, while the cottage level industry using obsolete equipment and technology at 1.

In corporate diagnosis charts the results of evaluation was presented in two radar charts, one for five principal areas and the other for "production".

As discussed in Chapter 5, this model project sets the improvement of productivity and competitiveness by using soft technology as the main kaizen theme. Fig.6.1 presents five-grade scale evaluation results (in the form of the radar chart) – before and after the field guidance - on the eight sub-items of the "production" category for all the companies excepting three companies for which guidance service was terminated (excluding the company that terminated due to a customer-related problem) and two companies that wanted to receive guidance on management accounting only.

Note that the average score on the production category for all the companies was 3.2 at the time of the corporate diagnosis and 4.0 after completion of guidance.

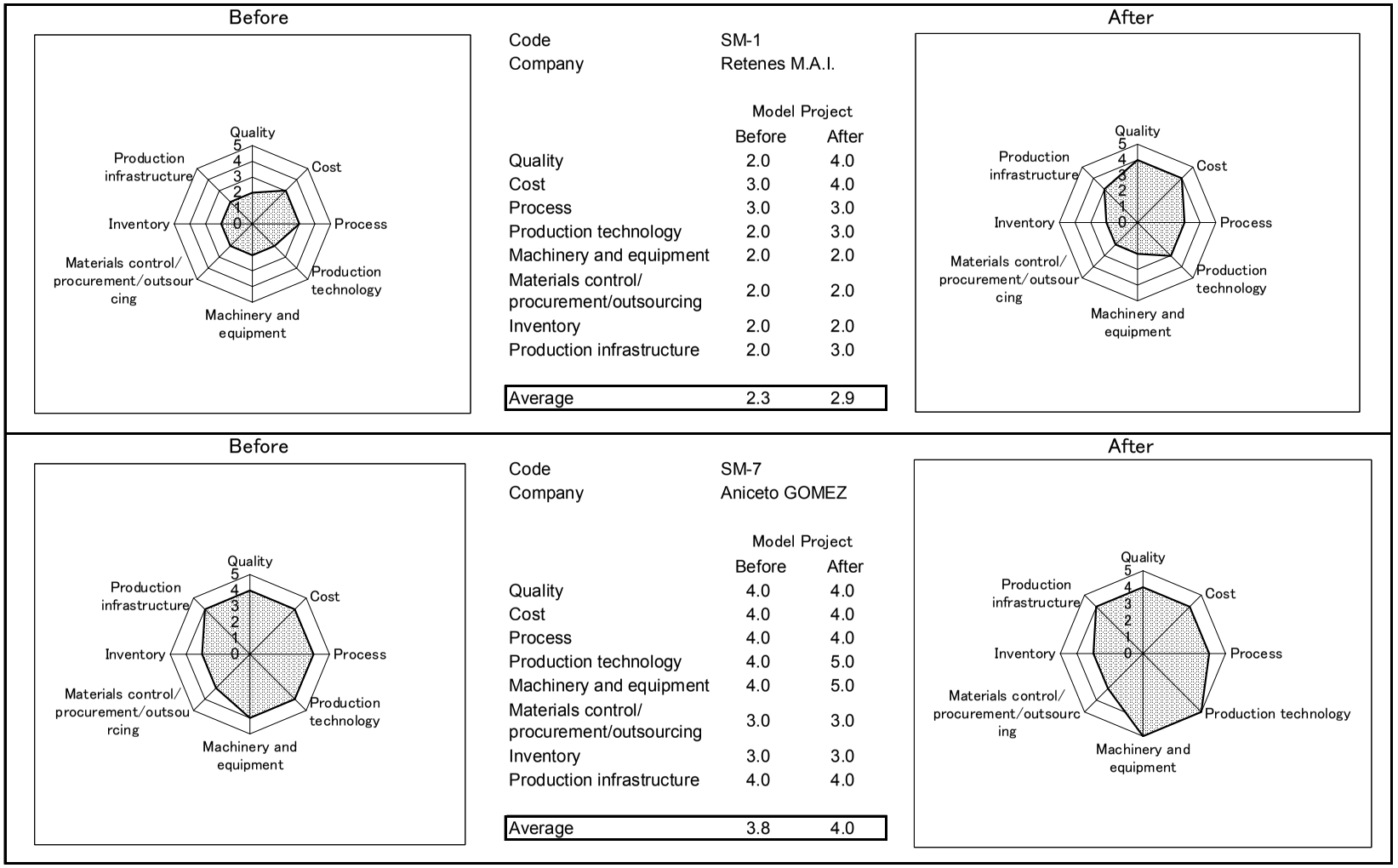
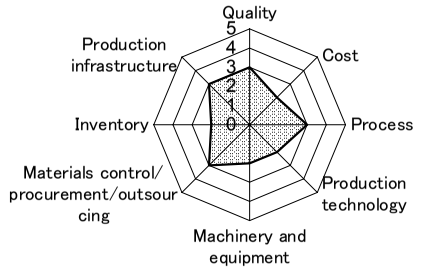


Fig. 6.1 Evaluation before and after Guidance (1/10)

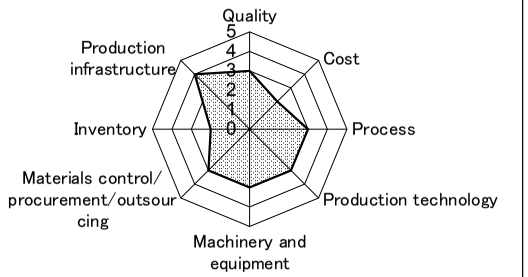
Before



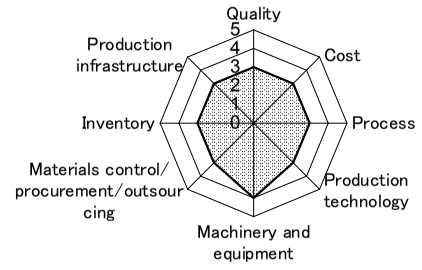
Code SM-10
Company Altissimo

	Model Project Before	After
Quality	3.0	3.0
Cost	2.0	2.0
Process	3.0	3.0
Production technology	2.0	3.0
Machinery and equipment	2.0	3.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	2.0	2.0
Production infrastructure	3.0	4.0
Average	2.5	2.9

After



Before



Code SM-12
Company Otia

	Model Project Before	After
Quality	3.0	3.0
Cost	3.0	3.0
Process	3.0	3.0
Production technology	3.0	4.0
Machinery and equipment	4.0	4.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	3.0	3.0
Production infrastructure	3.0	3.0
Average	3.1	3.3

After

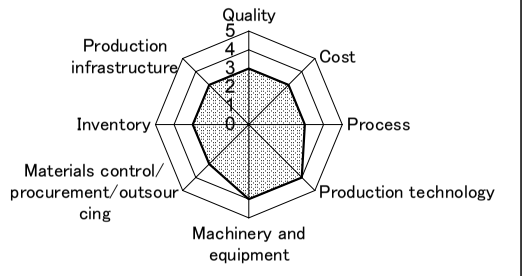
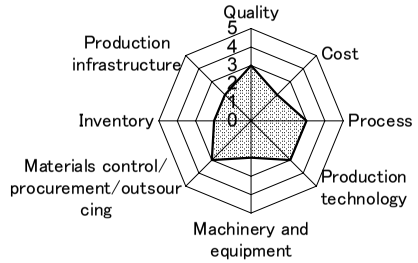


Fig. 6.1 Evaluation before and after Guidance (2/10)

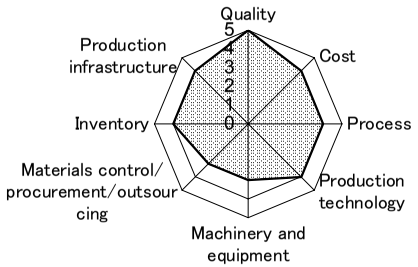
Before



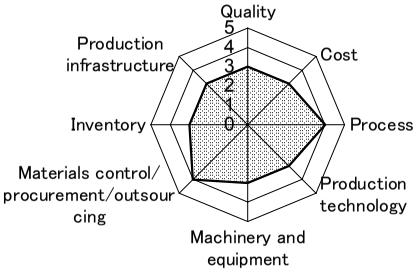
Code RO-1
Company Metaltecnica

	Model Project Before	After
Quality	3.0	5.0
Cost	2.0	4.0
Process	3.0	4.0
Production technology	3.0	4.0
Machinery and equipment	2.0	3.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	2.0	4.0
Production infrastructure	2.0	4.0
Average	2.5	3.9

After



Before



Code RO-2
Company Di Benedetto Hnos.

	Model Project Before	After
Quality	3.0	4.0
Cost	3.0	4.0
Process	4.0	4.5
Production technology	3.0	4.5
Machinery and equipment	3.0	4.0
Materials control/ procurement/outsourcing	4.0	4.5
Inventory	3.0	4.0
Production infrastructure	3.0	4.5
Average	3.3	4.3

After

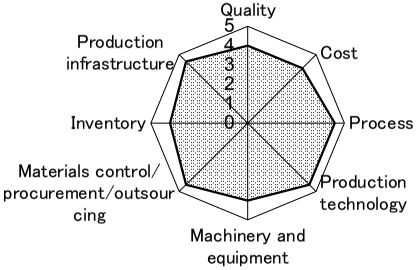
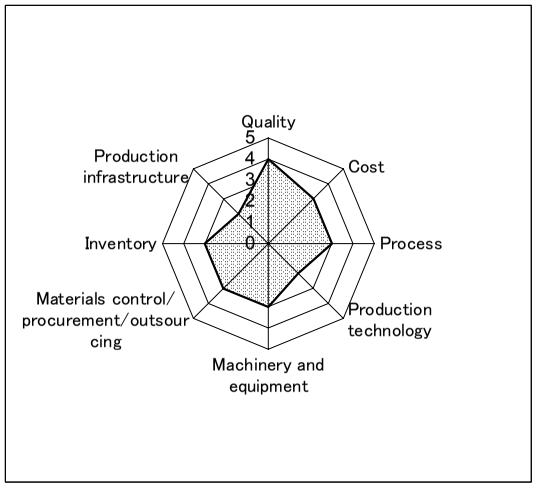


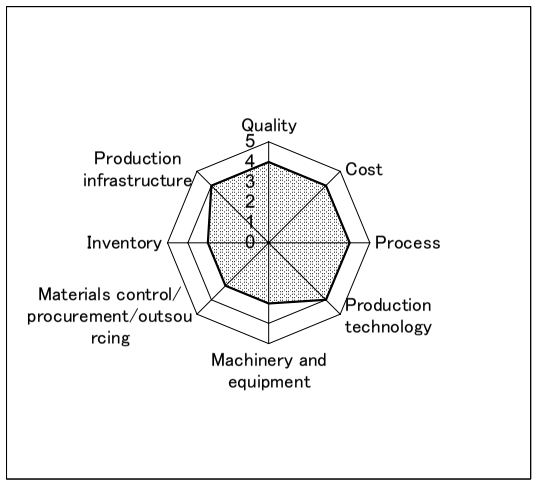
Fig. 6.1 Evaluation before and after Guidance (3/10)

Before

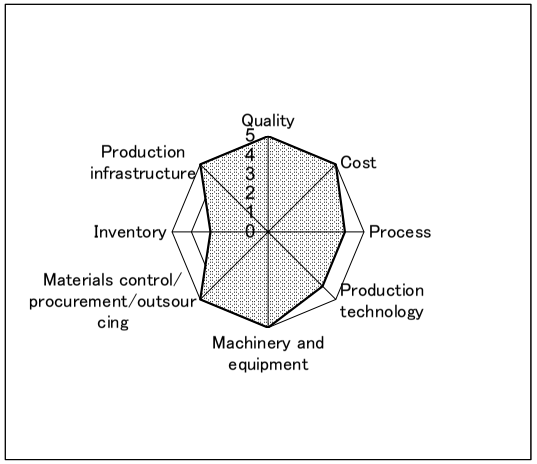


Code	RO-3	
Company	Fonderia	
	Model Project	
	Before	After
Quality	4.0	4.0
Cost	3.0	4.0
Process	3.0	4.0
Production technology	2.0	4.0
Machinery and equipment	3.0	3.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	3.0	3.0
Production infrastructure	2.0	4.0
Average	2.9	3.6

After



Before



Code	RO-6	
Company	KRETZ	
	Model Project	
	Before	After
Quality	5.0	5.0
Cost	5.0	5.0
Process	4.0	4.5
Production technology	4.0	4.5
Machinery and equipment	5.0	5.0
Materials control/ procurement/outsourcing	5.0	5.0
Inventory	3.0	4.5
Production infrastructure	5.0	5.0
Average	4.5	4.8

After

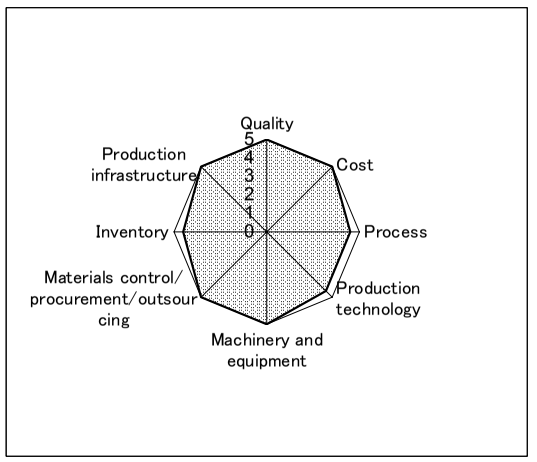
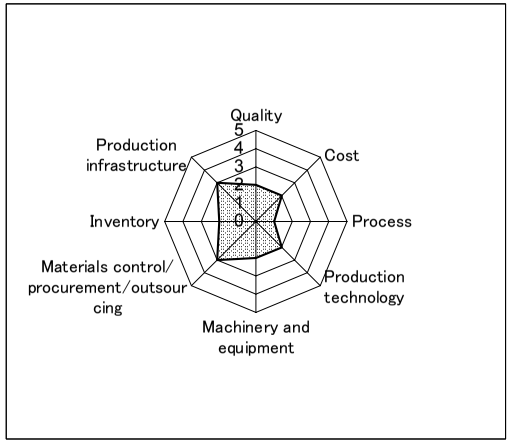


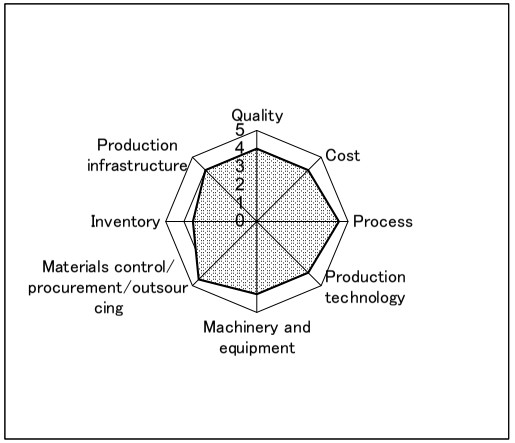
Fig. 6.1 Evaluation before and after Guidance (4/10)

Before

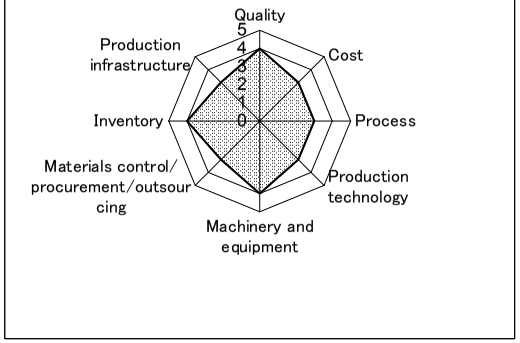


Code	RO-7	
Company	Fabrica Rosarina	
	Model Project	
	Before	After
Quality	2.0	4.0
Cost	2.0	4.0
Process	1.0	4.5
Production technology	2.0	4.0
Machinery and equipment	2.0	4.0
Materials control/ procurement/outsourcing	3.0	4.5
Inventory	2.0	3.5
Production infrastructure	3.0	4.0
Average	2.1	4.1

After



Before



Code	RO-9	
Company	Fundicion GATTI	
	Model Project	
	Before	After
Quality	4.0	4.0
Cost	3.0	3.0
Process	3.0	4.0
Production technology	3.0	4.0
Machinery and equipment	4.0	5.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	4.0	4.0
Production infrastructure	3.0	5.0
Average	3.4	4.0

After

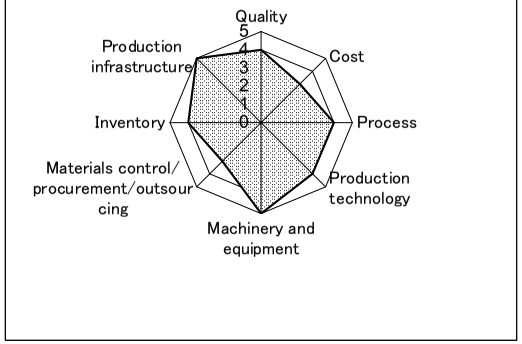
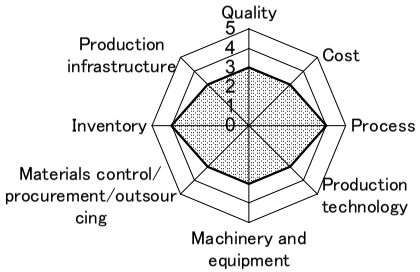


Fig. 6.1 Evaluation before and after Guidance (5/10)

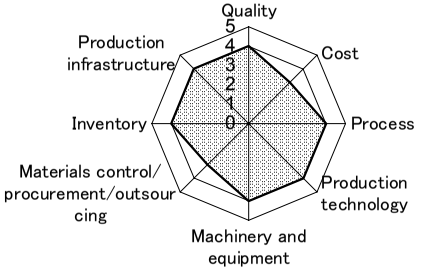
Before



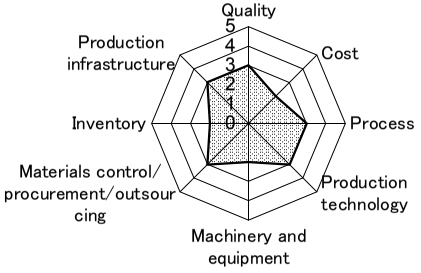
Code RF-2
Company Nelso Ferreyra

	Model Project Before	After
Quality	3.0	4.0
Cost	3.0	3.0
Process	4.0	4.0
Production technology	3.0	4.0
Machinery and equipment	3.0	4.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	4.0	4.0
Production infrastructure	3.0	4.0
Average	3.3	3.8

After



Before



Code RF-3
Company Frautschi

	Model Project Before	After
Quality	3.0	4.0
Cost	2.0	3.5
Process	3.0	4.0
Production technology	3.0	4.5
Machinery and equipment	2.0	4.0
Materials control/ procurement/outsourcing	3.0	4.0
Inventory	2.0	4.0
Production infrastructure	3.0	4.0
Average	2.6	4.0

After

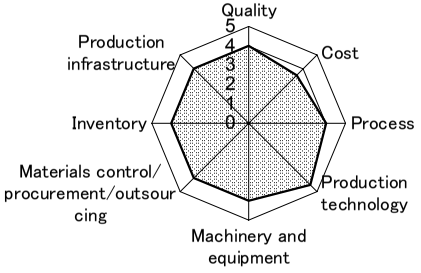
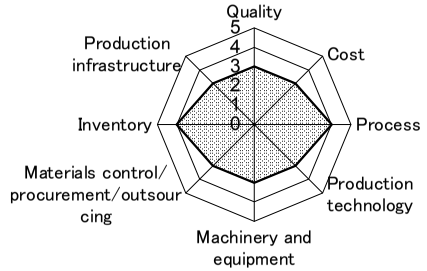


Fig. 6.1 Evaluation before and after Guidance (6/10)

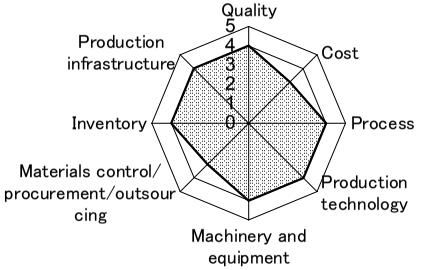
Before



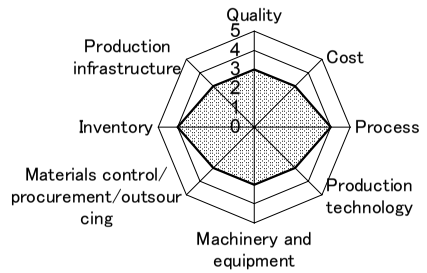
Code RF-4
Company Engracor

	Model Project	
	Before	After
Quality	4.0	4.0
Cost	4.0	4.0
Process	4.0	5.0
Production technology	4.0	5.0
Machinery and equipment	3.0	4.0
Materials control/ procurement/outsourcing	4.0	4.0
Inventory	4.0	4.0
Production infrastructure	5.0	5.0
Average	4.0	4.4

After



Before



Code RF-5
Company Topline

	Model Project	
	Before	After
Quality	3.0	5.0
Cost	2.0	3.0
Process	3.0	4.0
Production technology	3.0	5.0
Machinery and equipment	4.0	4.0
Materials control/ procurement/outsourcing	3.0	3.0
Inventory	3.0	3.0
Production infrastructure	4.0	5.0
Average	3.1	4.0

After

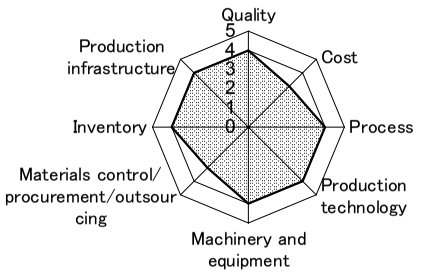
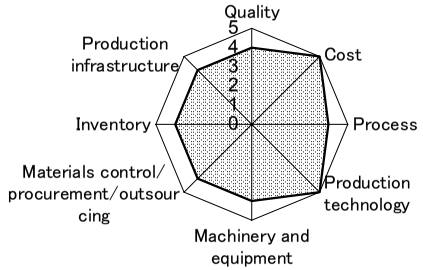


Fig. 6.1 Evaluation before and after Guidance (7/10)

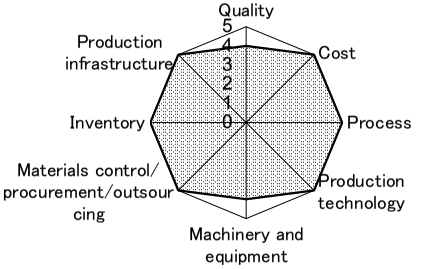
Before



Code CO-1
Company Rubol

	Model Project Before	After
Quality	4	4
Cost	5.0	5.0
Process	4.0	5.0
Production technology	5.0	5.0
Machinery and equipment	4.0	4.0
Materials control/ procurement/outsourcing	4.0	5.0
Inventory	4.0	5.0
Production infrastructure	4.0	5.0
Average	4.25	4.75

After



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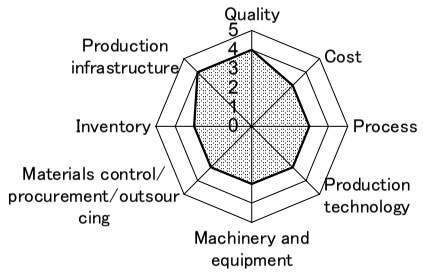


Code CO-3
Company FAESA

	Model Project Before	After
Quality	4	4
Cost	3.0	4.0
Process	3.0	3.0
Production technology	3.0	4.0
Machinery and equipment	3.0	3.0
Materials control/ procurement/outsourcing	3.0	4.0
Inventory	3.0	4.0
Production infrastructure	4.0	4.0
Average	3.3	3.8

After

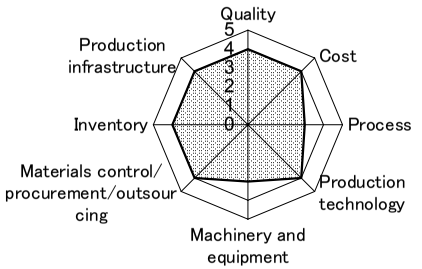
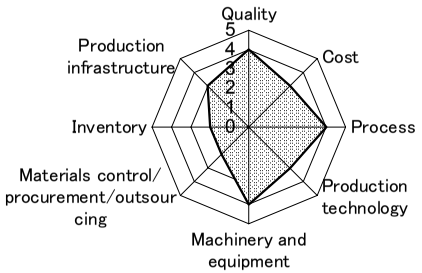


Fig. 6.1 Evaluation before and after Guidance (8/10)

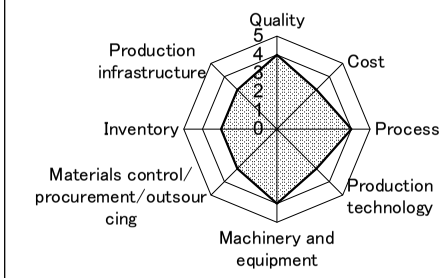
Before



Code CO-4
Company Giacomelli

	Model Project	
	Before	After
Quality	4	4
Cost	3.0	3.0
Process	4.0	4.0
Production technology	3.0	3.0
Machinery and equipment	4.0	4.0
Materials control/ procurement/outsourcing	2.0	3.0
Inventory	2.0	3.0
Production infrastructure	3.0	3.0
Average	3.1	3.4

After



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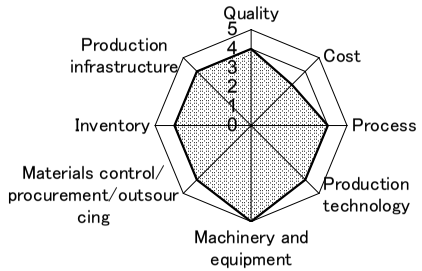


Code CO-5
Company Resortes Argentina

	Model Project	
	Before	After
Quality	4.0	5.0
Cost	3.0	3.0
Process	4.0	5.0
Production technology	4.0	5.0
Machinery and equipment	5.0	5.0
Materials control/ procurement/outsourcing	4.0	4.0
Inventory	4.0	5.0
Production infrastructure	4.0	5.0
Average	4.0	4.6

After

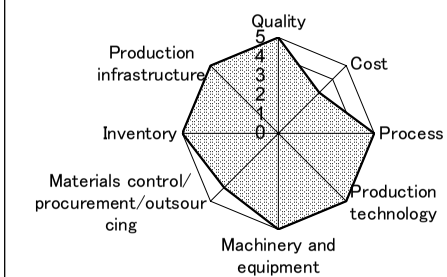
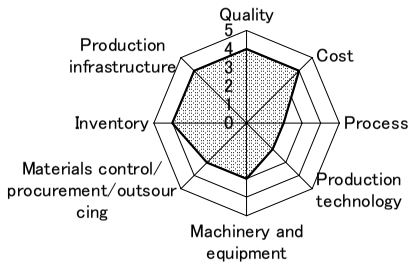


Fig. 6.1 Evaluation before and after Guidance (9/10)

Before



Code	CO-11
Company	MET. Degiorgis

	Model Project	
	Before	After
Quality	4.0	5.0
Cost	4.0	5.0
Process	2.0	5.0
Production technology	2.0	5.0
Machinery and equipment	3.0	5.0
Materials control/ procurement/outsourcing	3.0	4.0
Inventory	4.0	4.0
Production infrastructure	4.0	5.0
Average	3.3	4.8

After

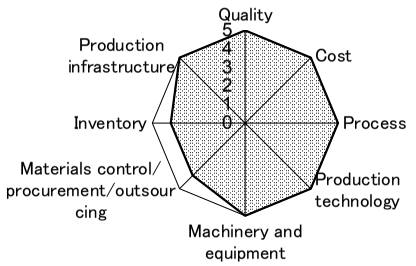


Fig. 6.1 Evaluation before and after Guidance (10/10)

6.1.2 Technology Transfer to INTI's Counterpart Staff

The model project had two purposes: 1) to raise interest in and demand for soft technology by demonstrating effectiveness of corporate guidance using soft technology; and 2) to assist INTI in establishing a formal system to provide field guidance service using soft technology. The study team's experts effectuated technology transfer to the counterpart staff throughout the model project period by performing joint field guidance service for individual companies, while conducting lectures and question and answer sessions as required.

Table 6.7 ~6.15 summarizes a record on technology transfer to INTI staff at four INTI regional centers, as conducted by four experts in the field of production management.

Table 6.7　Summary of Technology Transfer to INTI Staff during the Fourth Field Survey　(San Martín)

1	Period implemented	During the fourth field survey	May – June 2005
2	Study team member in charge	Akira Hata	
3	General content	1) Key points in 3S activities and method for identifying problems 2) Promotion of kaizen activities 3) Method for analysis after video recording 4) Layout techniques	
4	Comment by the study team member	1) Two INTI staff members were engaged in field guidance service. One of them resigned at the end of May and a new staff jointed later, totaling two. Their working experience at INTI is less than one year, with no experience as consultant. 2) They have learned contact and communication techniques with client companies (e.g., making appointment, briefing on field guidance service, and interview to learn opinions and requests). They are steadily gaining knowledge and skills to provide advice. 3) For the above reasons, the two staff members will have practical training to obtain field experience toward the year end. 4) Meanwhile, they conducted research on possible textbooks and found the following a book at INTI. Title: Manual de la Produccion Publisher : Uteha Noriega Editores Countries published: Mexico, Spain, Venezuela, and Colombia This is a voluminous book of 1,871 pages and is very useful for INTI. INTI staff is encouraged to read it. It takes around one year for reading and learning essences of the book, which should be incorporated into a formal training program. 5) Request to INTI Efforts should be made to retain trained staff as long as possible. In particular, it is desirable not to transfer the present staff for at least three years.	

Table 6.8 Summary of Technology Transfer to INTI Staff during the Fifth and Sixth Field Surveys (San Martín)

1	Period implemented	During the fifth field survey During the sixth field survey	August – October, 2005 November – December, 2005
2	Study team member in charge	Akira Hata	
3	General Content	Education and guidance for INTI staff was carried out on the method to promote job improvement, the method to practice 3S activities, and the effective use of production technology by staff in the manufacturing department, by using the following manuals furnished by the study team members. 1) A primer on job improvement and innovative efforts 2) Effective use of production technology In addition, a PowerPoint document to summarize an illustrated book on 3S (4S) practice (entitled "Systematic Practicing of 4S," compiled by the Central Association of Industrial Accident Prevention, and translated to Spanish) was used, including the technique to use the document for education and training for companies. Activities relating to technology transfer to INTI staff, which were conducted during the fifth and sixth field surveys, are summarized as follows. (1) Field tour to YAS (an affiliate of Yazaki Sougyou Group manufacturing automotive wire harnesses) A. The first tour was conducted on September 6 under participation of presidents and managers of model companies, totaling 15 persons. After the tour, participants went to INTI and held a meeting to exchange opinions, including requests for participation of field workers. B. The second tour was held on December 1 and was participated by 15 persons, mainly field workers in response to the request proposed after the first field tour. Participants included materials warehouse staff, and as a result, the tour went beyond the production field and served as an opportunity to learn about a wide range of production management. (2) Model company meetings Four meetings were already held to complete the first round of model company meetings in San Martin. September 26 At GOMEZ November 28 At Altissimo Note that MAI and Otia have previously hosted the meeting. (3) Rating training On September 29, the rating training was conducted in INTI's Building 12, to teach the skill to measure the operating speed and worker's motion – an essential skill for production technology staff. Using educational videos, the training course took three hours.	

		(4) Internship activity in corporate diagnosis and guidance service In San Martin, an increasing number of companies request INTI's corporate diagnosis and guidance service. Clearly, this provides a good opportunity to promote INTI's service. At present, seven companies are requesting corporate diagnosis. The study team member accompanied INTI staff to visit three companies and give advice on the interviewing method and corporate diagnosis techniques.
4	Comment by the study team member	(1) Field tour to YAS By courtesy and cooperation of YAS, the field tour was conducted twice, one for managers and the other for field workers. Participants were impressed by perfect 4S activities conducted on the shop floor. It was emphasized that YAS employees were all Argentine but one Japanese staff and they achieved the impressive results all by themselves, which will serve as an important example for other companies. (2) Model company meetings Four meetings were held at each of the four model companies during the fifth and sixth field surveys. Although the factory tours and meetings were held for the purpose of exchanging information and opinions, discussion was not deepened as participants had still to get acquainted to each other. As more meetings are held, they are expected to establish a closer relationship and communication. (3) The rating is a very important technique for production technology staff because it sets standard time. Training was conducted using videos that were essential teaching materials and were prepared by the study team member. It covered three assembly operations: (1) printed circuit boards; (2) machine parts; and (3) air-conditioner fans. All of them focus on manual assembly operations by workers. This was the first experience for INTI staff. As preparatory work to learn basic procedures for setting standard time was required, guidance was given prior to actual training. (4) Companies visited for the internship program After consultation with INTI staff, the internship program was conducted for the following three companies. (1) Company C - It manufactures industrial rubber products and plans to construct a new factory in BsAs's industrial estate in 2006. INTI staff provides guidance for factory layout planning. (2) Company M It operates a factory to perform machining and assembly of automotive steering systems, especially cutting and forging. Other than engineering technology, reduction of intermediate work-in-process inventory is a major issue.

		(3) Company K It manufacturers door keys at the rate of 2,000 units per day. Characteristically, each key is made according to unique specifications and is different from one another despite of similar appearance. The company has a large amount of intermediate parts. Also, the press working process is large done by manual fitting and job improvement is required. For these companies, INTI is expected to identify kaizen themes and make specific proposals to address the issues. To ensure the development of effective kaizen proposals that reflect the company's wants and needs, the study team member gave guidance and advice to upgrade INTI staff's skill level.

Table 6.9 Summary of Technology Transfer to INTI Staff during the Fourth Field Survey (Rosario)

1	Period implemented	During the fourth field survey	May – June 2005
2	Study team member in charge	Nobushige Fukase, Teruo Higo	
3	General content	1. Cost reduction by VA/VE and small group activities (May 24 (Sun.): JICA expert's office at INTI Rosario) 1) The basic concept and approach to VA/VE-enabled cost reduction was presented using the manual in Spanish. 2) Advice on small group activity was made, including discussion on problems facing INTI staff and possible solutions. 2. TPM (June 9 (Thr.)): A joint meeting with Mr. Higo to exchange opinions with all INTI staff 1) Presentation materials on TPM (for client companies) prepared by INTI were reviewed and corrections and modifications were suggested. 2) Presentation materials on TPM covering the basic concept and potential effect (in Spanish, prepared by Mr. Fukase) and a guideline in English were distributed and discussion was made. 3) Mr. Higo pointed out major issues to be dealt with by INTI Rosario, followed by discussion. 4) As for QC circles (as requested by INTI), there was no time to cover the subject, and presentation materials (English) were distributed instead. 5) INTI staff proposed to discuss on the following subjects during the fifth field survey: (1) Presentation on Japanese case studies on TPM; (2) Basic concept and principles relating to plat design, equipment layout, etc. 3. OJT for INTI Rosario staff through field guidance for client companies 1) Construction of QC flow charts and meaning of symbols 2) Data assortment and tabulation methods, and a basic approach to QC 3) Method for obtaining/calculating indices and indicators required for factory management; it was taught through actual field guidance experience. 4) 5S: INTI staff was given of opportunity to explain 5S activities to managers and kaizen teams of client companies. As a result, they gained a better understanding and INTI staff gained confidence. 4. Future involvement in INTI/JICA kaizen projects 1) While JICA experts are in Japan (also applied to other INTI offices) - INTI will send field guidance records to Japan (they should preferably visit each company twice per month). - Questions raised by INTI staff and client companies should be sent by e-mail. 2) Key points relating to INTI Rosario - For all the three companies, indices and indicators to measure effect of kaizen activity have been just determined, and actual kaizen activities have not started yet. - As kaizen activities start and results are recorded and compiled monthly, the companies are expected to analyze the results, devise corrective measures, and develop an activity implementation schedule (including designation of responsible persons, together with the minutes of meeting. INTI staff is expected to receive relevant documents and send them to Japan.	

		3) Request by INTI staff concerning future lectures - They cited Six Sigma and TPM as future subjects. 4) Relationship with outside consultant Discussion was made on the relationship with an outside consultant, who is hired by a model project company. 5) Future strategy and new business Proposals and recommendations on future strategy and new business of INTI Rosario were presented using the market growth rate/competition rate matrix and the product/market matrix.
4	Comment by the study team member	1. INTI Rosario staff strive to deal with various problems and issues that they face in actual support activities for SMEs, as evidenced by questions raised in discussion, which are very down-to-earth and come to the point. INTI Rosario staff also felt that such meeting was very useful and wanted to continue it in the future, which I agreed with. 2. On the other hand, INTI Rosario receives many requests from companies for guidance relating to 5S and ISO9000 certification, and it does not have much time or resource to deal with other themes. Clearly, it should expand the scope of activity by acquiring guidance skills relating to ISO14000 and Six Sigma, thereby to provide a wider range of field guidance service for SMEs.

Table 6.10 Summary of Technology Transfer to INTI Staff during the Fifth and Sixth Field Surveys (Rosario)

1	Period implemented	During the fifth field survey During the sixth field survey	August – October, 2005 November – December, 2005
2	Study team member in charge	Teruo Higo	
3	General Content	1) OJT guidance for INTI staff When we visited FRA, management and the kaizen team did not understand 5S very well and I asked INTI staff to explain it. As a result, the company gained a good understanding and was very satisfied. Thus, this experience worked as an excellent OJT. 2) Future strategy and new business For future strategy and new business of INTI Rosario, proposals and recommendations were made using the "market growth rate/competition rate matrix" and the "product/market matrix." Guidance and support technique designed for conventional factory management, such as 5S, TPM, TQC, the Toyota kaizen system, and support for ISO9000 certification, is positioned as "cash cow" – business expansion opportunity in the existing market by using existing products – and can become investment resources. It is self-evident that modern factory management will become pervasive in Argentina in the near future, as seen in China, Southeast Asia, and Brazil. In preparation for such situation, efforts to expand into new business/market by using new products are required, such as introduction of the cell production system, training of all round skilled workers, Six Sigma, SCM, CRM, new business/production implementation (including design). It was advised to master necessary knowledge and technology head of outside consultants and customers and develop them into business. 3) Implementation of mutual visit and field tour for model companies It was advised to continue the project as well as the field tour program to advanced companies, such as Toyota, Denso, and Yazaki Sougyou. 4) Use of INTI staff as special instructors for kaizen project leaders at the SME business school It was advised to use them as special instructors of the "SME Business and Production Management Business School" (under preparation) for model companies that have produced good results in the project.	

4	Comment by the study team member	1) After the FRA case, INTI staff became actively involved in the field guidance activities, which served as a formal OJT to help them learn and improve leadership and consulting capabilities. 2) At present, existing services are gaining popularity in new markets (customers) and are not able to catch up with demand, in particular, staff is in a serious shortage. However, it did not seem that sales and profits grew significantly over two years ago. Meanwhile, the shortage of consumables and the poor infrastructure have not changed. A plan to operate a business school, which was started two years ago, seems to need some more time before actual opening, although classrooms are almost ready by remodeling the old facilities and used PCs (25 units donated by Sony) are available. The present system relies much on volunteer workers and should be developed to a value added service business. Existing consulting services should also be strengthened by networking outside consultants or outsourcing. 3) It was advised to strengthen complementary services such as promotion of collective purchasing of parts and materials, intermediary service to find potential customers, and export promotion. 4) Present INTI staff can teach production management theories and techniques in classrooms, but what is lacking is a system to teach field applicable knowledge and techniques that are founded on actual experience and reflect actual conditions at factories, including recent results of kaizen activities. It is recommended to invite Japanese experts in relevant fields on a short-term basis.

Table 6.11 Summary of Technology Transfer to INTI Staff during the Fifth and Sixth Field Surveys (Rosario)

1	Period implemented	During the fifth field survey During the sixth field survey	August – October, 2005 November – December, 2005
2	Study team member in charge	Nobushige Fukase	
3	General Content	INTI staff always participated in field guidance activities in order give an opportunity to learn SME guidance techniques on an OJT basis. This method is believed to help SME staff to develop expertise and experience in consultation service for SMEs. During the sixth field survey, an emphasis was made to teach the methods for preparing presentation materials used at the seminar where model companies report their kaizen activities and results, and the presentation method, with view to transferring the same to INTI staff. In addition to the practical training in the form of OJT, the following workshops were held for INTI staff. 1. First technology transfer workshop for INTI Rosario staff (with Mr. Higo) Date: September 7 (Wed.) Place: JICA expert's office at INTI Rosario (INTI's meeting room) Participants: Raul Castano, Manuel Torne, Gabriela Rafelli General content (1) Desirable role of INTI as coordinator for the meeting of model companies (Fukase) Exchange of opinions on Metaltecnica 's VA/VE held on August 25 (2) Revitalization of companies by small group activities (Fukae) Lecture was given on the basis of the document entitled "Revitalization of companies by small group activities" (in Spanish and written by Mr. Fukase). (3) Six Sigma (opportunity for a new management technique) (Higo) 2. Second technology transfer workshop for INTI Rosario staff Date: September 12 (Mon.) Place: JICA expert's office at INTI Rosario Participants: INTI Rosario, Luis Ayarza General content : Guidance using video brought by JICA expert 1) Small group activities 2) 5S's for small and medium enterprises 3. Third technology transfer workshop for INTI Rosario staff Date: September 12 (Mon.) Place: JICA expert's office at INTI Rosario	

		Participants: Raul Castano, Gabriel Gorostarzu, Manuel Torne, Gabriela Rafelli General content: The following lecture was made using the manual prepared by the JICA study team members (in Spanish). (1) Promotion of quality control at foundry (The title includes the word "at foundry" because data obtained from foundries were extensively used for ease of understanding, but the basic concept and technique for quality control as discussed here is applicable to all industries.) (2) Experimental design method (Taguchi method) 4. Meeting between SME suppliers and large assembly manufacturers as customers Date: September 12 (Mon.) Place : A meeting room at John Deere Purpose: To exchange opinions with the purchase division of John Deere, to which Metaltecnica and GATTI supply parts, for the purpose of information exchange and mutual understanding. Participants: INTI Rosario: Raul Castano and Manuel Torne Metaltecnica: Carlos A. Boadella (Aseguramiento de CALIDAD), Ing. Migel Ronco(Ventas) GATTI : C.P.M. Antonela Gatti (Staff de Gerencia) John Deere: Eng. Carios M. Casanova（Purchasing & Exports Manager） Ing. Alexis M. Manavella（Purchasing & Exports Department） Ing. Federico Catenaccio(Purchasing & Exports Department) General content: OJT-based guidance for the coordinating role of the consultant at the meeting between SME suppliers that are represented by model companies and large assembly manufacturers that are customers 5. Meeting with six model companies in Rosario Date: September 28 (Wed.) Place: JICA expert's office at INTI Rosario (INTI's meeting room) Participants: INTI Rosario: Raul Castano, Gabriel Gorostarzu, Manuel Torne, Gabriela Rafelli Customer: Metaltecnica；Juan Alvarez(Gerente), Carlos A. Boadella(CALIDAD), Laura Zabalza (5S y Grupos de Calidad) GATTI: C.P.M.Marcos I. Meneghetti (Staff de Gerencia) FONDORIA: Ing. Ricardo Gerosa(PRESIDENTE) ETMA: One DBH: One KRETZ: One

		Major subjects of discussion: Meeting with six model companies in Rosario to exchange opinions (1) Presentation on progress of kaizen themes by six model companies (2) comments by JICA experts and Mr. Castaño of INTI (3) Report by Mr. Gabriel Gorostarzu of INTI on his training experience in Japan (field tour; 5S)
4	Comment by the study team member	1. "Revitalization of companies by small group activities" at the first technology transfer workshop for INTI Rosario staff on September 2 INTI participants commented that the presentation was based on actual experience and very useful. It was recommended that the document be used as the basis of developing a useful guidance for small group activities that is suitable for conditions in Argentina. 2. Guidance for the coordinating role of the consultant at the September 12 meeting between SME suppliers that are represented by model companies and large assembly manufacturers (customers) seems to have been useful for INTI personnel. In the future, INTI is expected to coordinate the place for exchange between SME suppliers and large assembly manufacturers. 3. The September 28 meeting with six model companies in Rosario 1) As Mr. Castaño proposed, at the beginning of the meeting, to exchange opinions on results of small group activities, major issues, and future plans of the six companies, presentation and discussion was centered on small group activities including 5S. However, cost reduction by VA/VE, layout improvement, and PPM reduction activities should have been explained in more detail. 2) The participating companies commented that the teamwork approach to problem solving and quantitative management based on indices (plotting them on graphs and tables) was very useful. 3) Mr. Gabriel Gorostarzu's report on training in Japan was very good as it presented 5S and other conditions at Japanese companies visually by using pictures taken during the field tour. 4. The document entitled "Promotion of quality control at foundry" that was distributed at the third technology transfer workshop on December 12 incorporates a large amount of data collected at factories and is expected to be readily and widely useful on the shop floor. While the title includes the word "at foundry" because data obtained from foundries were extensively used, but the basic concept and technique for quality control as discussed here is applicable to all industries and is encouraged for extensive use. Also the experimental design method (Taguchi method) is a very useful technique for the planning of the test to solve technical issues facing factories and analysis of results, and it is desirable to study it further and use it in the production environment.

Table 6.12 Summary of Technology Transfer to INTI Staff during the Fourth Field Survey（Rafaela）

1	Period implemented	During the fourth field survey	May – June 2005
2	Study team member in charge	Nobushige Fukase, Teruo Higo	
3	General content	1. OJT for INTI Rafaela staff 1) The present staff works at INTI Rafaela for one or two years and lacks practical experience. It is important for them to visit factories with JICA experts and gain field experience. 2) At the INTI/JICA meeting prior to the start of field guidance activity, INTI staff expressed concern that “they were not received well by companies.” INTI staff was then accompanied when we visited individual companies, and the intent of the model project, its promotion method, and the role of INTI staff were explained and discussed to help align their recognition and interest. 3) Through the discussion, INTI staff seem to have understand desirable ways to promote the model project and the method for negotiation and discussion with client companies. In fact, INTI staff acknowledged that participation in the field visit was very helpful for learning about discussion with companies, etc. 2. Exchange of opinions with director of INTI Rafaela 1) On June 13 (Mon.), discussion was help for around one hour with the director on implementation of the model project for companies in Rafaela and the role of INTI staff, and we explained the viewpoints of JICA experts. Then, the current status of INTI/JICA kaizen projects in Rosario and Cordova was explained and it was proposed that INTI Rafaela takes a lead in planning workshops and factory tours for model companies. The director agreed with our proposal and it is expected to be realized in the near future. 2) The director participated in the field guidance activity in June 14, in an attempt to help him understand the basic concept and approach to model projects led by JICA experts.	
4	Comment by the study team member	1 This time, technology transfer to INTI Rafaela staff in the form or lecture or workshop was not implemented. It should preferably be incorporated into the next opportunity. 2. Two INTI Rafaela staff members in charge of field guidance commended that participation in the field guidance activity was very useful in learning the way to discussing and communicating with client companies. Thus, technology transfer to INTI staff in the form of OJT helps the model project in Rafaela to solve problems relating to the relationship and communication between INTI and participating companies and to go on the right track in the future. 3. There may be a communication problem between INTI field staff and the director, as INTI staff in charge of the kaizen project works at the office in the city, which is away from INTI Rafaela’s office. It is hoped that the director provides adequate advice or support for the kaizen project staff whenever they face a problem. 4. The project staff apparently lacks the ability to predict and solve problems. Manuals and other support tools should be provided. In any case, they work faithfully and are willing to learn, so that it is expected that they will acquire necessary capabilities and skills by gaining field experience.	

Table 6.13 Summary of Technology Transfer to INTI Staff during the Fifth and Sixth Field Surveys (Rafaela)

1	Period implemented	During the fifth field survey During the sixth field survey	August – October, 2005 November – December, 2005
2	Study team member in charge	Teruo Higo	
3	General Content	1) OJT-based guidance by INTI staff Partly because INTI Rafaela has a short history of SME guidance and support, its consulting capability is lower than INTI Rosario. As personnel engaged in field guidance worked for only one or tow years with few field experience, they were given of opportunity to visit factories with study team experts to gain practical knowledge and experience on an OEM basis. 2) Scope of guidance and target level For INTI Rafaela staff with their current skill level, it was difficult to provide guidance and support that creates tangible benefits for SMEs. Thus, an attempt was made to raise their level to that of INTI Rosario staff, rather than the study team. In particular, advice was made at mini-seminars at model companies, workshops, video presentations, and presentation meetings, by pointing out what they needed to learn and obtain. 3) Planning of mutual visit and field tour programs for model companies Trainees participated in various seminars and workshops and were engaged in planning and arrangement for mutual visit and field tour programs for model companies that received field guidance from the study team experts in order to improve coordinating and consulting capabilities and to encourage self-development efforts.	
4	Comment by the study team member	1) Accompanying the expert during field guidance service was proven to be a good practical training by giving ITNT Rafaela trainees an opportunity to explain or state opinions as much as possible. They are expected to improve skills further on the basis of knowledge and experience gained from the OJT. 2) Participation in the CP training program in Japan also provided good practical training opportunities. Learning SME policies and programs in Japan and visiting factories helped participants to raise motivation and confidence. What is needed is the development of a mechanism to feed back their experience to INTI and local companies in Rafaela, as many companies are highly interested in training in Japan. 3) As revealed in the ETMA case, the director lacks the ability to identify and solve problems quickly by visiting the field, and so do other staff engaged in field service. To supplement their limited capabilities, the manuals for consultants (basic and advanced) seem to be dispensable. In any case, the counterpart staff was serious and showed a positive attitude to learn, so that their future potential is high. 4) It is recommended that they attend in the business school that will be held at INTI Rosario as special student and learn about fundamental of factory management, including 5S, TPM, TQC, the Toyota kaizen system, and support for ISO9000 certification. This will form the basis of consulting skills that will lead to the ability to provide field guidance and support for local companies	

Table 6.14 Summary of Technology Transfer to INTI Staff during the Fifth and Sixth Field Surveys (Rafaela)

1	Period implemented	During the fifth field survey During the sixth field survey	August – October, 2005 November – December, 2005
2	Study team member in charge	Nobushige Fukase	
3	General Content	INTI staff always participated in field guidance activities in order give an opportunity to learn SME guidance techniques on an OJT basis. This method is believed to help SME staff to develop sharable expertise and experience in consultation service for SMEs. During the sixth field survey, an emphasis was made to teach the methods for preparing presentation materials used at the seminar where model companies report their kaizen activities and results, and the presentation method, with view to transferring the same to INTI staff. In addition to the practical training in the form of OJT, the following workshops were held for INTI staff. 1. First technology transfer workshop for INTI Rafaela staff Date: September 7 (Wed.) Place: CCIR's meeting room Participants: Eight INTI staff members including Director Diego Eduardo Laorden JICA SV (Mr. Sakakibara) resident in Rafaela Topic: Small group activity and revitalization of companies - The workshop consisted of a lecture for three hours and half using manual in Spanish (prepared in Japan) including a question and answer session where many questions were asked and answers based on experience in teaching small group activities in Japan were well received. After the workshop, a meeting was held with personnel engaged in the kaizen project to exchange opinions on INTI's field guidance for model enterprises, including issues to be solved, and advice was made on various points, including the method for evaluating and summating achievements at model companies, which will be compiled into a report by the year end. 2. Second technology transfer workshop for INTI Rafaela staff Date: September 20 (Tue.) Place: INTI Cordoba Participants: Six INTI Rafaela staff members (Diego Eduardo Laorden, Gustavo Valfré, Bruno Bonino, Magnien Mauro, Andrea Rodríguez, Gabliela, Costamagna) Topic: Toyota KANBAN system The above six persons participated in the workshop on the kanban system, which was held at INTI Cordoba and led by Mr. Wakamatsu, JICA study team member.	

		3. Third technology transfer workshop for INTI Rafaela staff Date: September 23 (Fri.) Place: INTI office in Rafaela City Participants: Six INTI Rafaela staff members (Diego Eduardo Laorden, Gustavo Valfré, Bruno Bonino, Natalia Aniboti, Mauro A. Magnien, Emanuel Zachart) Two JICA SVs (Mr. Sakakibara and Mr. Kaneko) Topic: A meeting was held with six INTI Rafaela staff members to review the September 21 meeting with model companies, and then the lecture was given for the following two subjects: (1) Cost reduction by VA/VE (2) TPM 4. Fourth technology transfer workshop for INTI Rafaela staff Date: December 8 (Thr.) Place: NTI office in Rafaela City Participants: Six INTI Rafaela staff members (Diego Eduardo Laorden, Gustavo Valfré, Bruno Bonino, Natalia Aniboti, Emanuel Zachary) JICA SV (Mr. Sakakibara) Topic: As INTI Rafaela was about to start field guidance service in the field of quality control for microenterprises, the following lecture was given using the manual in Spanish prepared by the JICA study team members. (1) Promotion of quality control at foundry (The title includes the word “at foundry” because data obtained from foundries were extensively used for ease of understanding, but the basic concept and technique for quality control as discussed here is applicable to all industries.) (2) Experimental design method (Taguchi method) 5. Meeting with four model companies in Rafaela District Date: September 21 (Wed.) Place: Engracor S.A. Participants: Four INTI Rafaela staff members (Diego Eduardo Laorden, Gustavo Valfre, Bruno Bonino, Natalia Aniboti) Topic: Meeting with four model companies in Rafaela District to exchange opinions on the kaizen project (1) Presentation on activities at Engracor S.A. relating to kaizen themes by Engracor’s personnel in charge of kaizen activity (2) Exchange of opinions and views on various subjects relating to kaizen activity, such as methods, troubles and problems, under participation of representatives of four model companies, four INTI Rafaela

		staff members, other two participants, and JICA study team members and interpreters, totaling 18 persons 6. Workshop on the kanban system for INTI Rafaela staff, model companies in Rafaela and other companies and related organizations Date: September 6 (Tue.) Place: CCIR's meeting room Participants: INTI staff, led by Director Diego Eduardo Laorden Employees of four model companies in Rafaela Other companies and related organization, including mayor of Rafaela Topic: Toyota KANBAN system A special workshop on the KANBAN system was held by Mr. Wakamatsu, who served as the advisor for model companies in Cordoba 7. Workshop for four model companies in Rafaela and FUNDICION GATTI for INTI Rosario Date: December 9 (Fri.) Place: Engracor S.A. Participants: Two INT Rafaela staff members (Gustavo Valfré, Bruno Bonino) Model companies: 7 representatives of ENGRACOR, 2 (TOPLINE), 2 (Frautshi), and 2 (FUNDICION GATTI), totaling 13 persons JICA SV (Mr. Sakakibara) Guidance theme (1) Promotion of quality control at foundry (The title includes the word "at foundry" because data obtained from foundries were extensively used for ease of understanding, but the basic concept and technique for quality control as discussed here is applicable to all industries.) (2) Experimental design method (Taguchi method)
4	Comment by the study team member	1. First workshop for INTI Rafaela on September 7 1) Many people attended, including Director Diego and employees from administrative and other divisions that were not directly related to the kaizen project, indicating high interest of INTI Rafaela. Many questions were asked from participants and some commented that answers based on Japanese examples were comprehensive and useful. 2) INTI Rafaela showed the intention to provide training for companies in Rosario by using the manual entitled "Small Group Activity and Revitalization of Companies."

		3) Meeting with staff in charge of the kaizen project after the workshop INTI faced difficulty in dealing with Nelso Ferreyra, which was expected to present a problem from the beginning. It was advised to produce favorable results by focusing on field guidance for Engracor, TOPLIE and other companies that were actively engaged in the kaizen project. 2. The September 21 meeting with model companies in Rafaela was successful not only in that results of kaizen activities by individual companies were presented, but also in that many questions were raised to stimulate active discussion. In particular, discussion was made on common issues of companies, e.g., how they can motivate employees, and how they can continue kaizen activities. Thus, it served the original purpose of creating an opportunity to exchange opinions under the leadership of model companies and produced successful results more than expected as the first of such meeting. Participants valued it highly and it was agreed to held the second meeting at TOPLINE in October. 3. INTI Rafaela's business has been expanding steadily. With expansion of SME support in the province of Entro Rio, annual sales grew from 200,000 pesos last year to an estimated 600,000 pesos this year. An increase of 400,000 pesos is said to come from soft support service. INTI Rafaela held a workshop in Buenos Aires upon request from Bosh for education and training for its affiliates. INTI's office in Rafaela City increased from 3 to 5 persons, and Director Diego seemingly starts to emphasize on soft technology support. 4. INTI Rafaela promptly and effectively uses documents prepared and furnished by JICA study team members. This is an excellent attitude and seems to help INTI Rafaela to expand soft support business rapidly. 5. The document entitled "Promotion of quality control at foundry" that was distributed at the third technology transfer workshop on December 8 incorporates a large amount of data collected at factories and is expected to be readily and widely useful on the shop floor. While the title includes the word "at foundry" because data obtained from foundries were extensively used, but the basic concept and technique for quality control as discussed here is applicable to all industries and is encouraged for extensive use. Also the experimental design method (Taguchi method) is a very useful technique for the planning of the test to solve technical issues facing factories and analysis of results, and it is desirable to study it further and use it in the production environment.

Table 6.15 Technology Transfer to INTI Staff during the Fourth, Fifth and Sixth Field Surveys（Córdoba）

1	Period implemented	During the fourth field survey During the fifth field survey During the sixth field survey	May – June 2005 August –October 2005、 November – December 2005
2	Study Team member in charge	Rinji Wakamatsu	
4	General Content	1. Learning the Toyota production system 1) Preparation of source materials for the seminar: To help participants to understand an overall image of the Toyota production system, PowerPoint presentation sheets were prepared in Spanish. Meanwhile, video presentations and factory tours at various companies were fully attended to promote understanding of the broad workforce. 2) It was recommended to obtain and read a good textbook on the Toyota production system, entitled “El Sistema de Producción de Toyota” (author: Yasuhiro Monden). In addition, “El Sistema de Producción Toyota” (author: Taiichi Ohno) was purchased. 3) Other: A workshop was held to teach an introductory part of the Toyota production system to Cordoba INTI staff (other than counterpart staff) and was attended by nine persons. Then, “Kanban Seminar II” to discuss operation of “kanban” – a core element of the Toyota production system – was held and attended by a large number of Cordoba INTI staff members. 2. Learning the field guidance method Since the start of the project, guidance has been provided to let participants learn by observing the field and circumstances, rather than just teaching the technique. During the fifth field survey, Cordoba INTI staff other than counterpart staff accompanied the study team for technical guidance of individual companies.	
5	Comment by the study team member	Field guidance is centered on technology transfer on an OJT basis. This is because the Toyota production system weighs experience in the field and actual production, rather than the mere accumulation of knowledge, and mandates training of engineers and technicians who know the shop floor. For instance, production technology is essential technology for production facilities, based on equipment planning, but it is not the only technology to make a good product at low cost. Equally important is production management technology that deals with management of the shop floor that makes actual products. It includes technology to make a good product in an efficient manner by using production equipment and tools in an adequate and optimal way. In other words, it is the everyday field production technology that can make a difference in quality and cost between identical products that are made by the same manufacturer using the same equipment. By establishing, practicing and inheriting field-oriented production technology, Japanese manufacturers and factories have been steadily improving international competitiveness. The Toyota production system is founded upon such technology and is known and applied worldwide. Thus, technology transfer under the project should not be limited to the teaching of knowledge. Rather it becomes effective when INTI staff who knows the shop floor is used. For INTI to provide field guidance on its own in the future, it should establish an organization that is capable of meeting the needs and wants of individual companies, i.e., it needs to organize a team of hardware	

		and soft technology experts to provide customized advice and guidance. Furthermore, the team should be reorganized flexibly according to the improvement of the company's ability and any change in a desirable area of kaizen activity. This way, INTI will be able to gain confidence of client companies. Finally, the basic philosophy for technology transfer is not "one-way, top-down teaching" but "mutual learning." I hope that our technology transfer will propagate the true concept and intent of field guidance.

6.1.3 Evaluation of the Model Project and its Results

This evaluation was conducted upon completion of the model project for the purpose of performing overall verification on whether the project has achieved its objective, on the basis of PDM described in Chapter 5. After the analysis of the current state and actual results, the project was evaluated in terms of adequacy, efficiency, and effectiveness, and lessons learned from implementation were documented. Note that recommendations made by the study team on the basis of the results of the model project are presented in Chapter 10 "Proposal of Action Programs."

(1) Analysis and verification of implementation results

Input planned for the project was made mostly according to the plan. It consisted of the following: 1) Japanese experts of the study team, with field activities in Argentina of approximately 18 men-month mostly devoted to field guidance for individual companies and technology transfer to INTI staff (field guidance service was conducted at a rate of once per week on average); 2) 8 – 10 staff members of INTI's four regional centers as the counterpart organization; 3) implementation of field guidance using soft technology, jointly by the study team and INTI, for 24 companies; 4) presentation seminars on project results at four locations, theme-specific workshops (Kanban, VE/VA, Six Sigma, etc.), joint study groups by participating companies, and field tours by participating companies on Japanese-affiliated companies that use advanced soft technology; and 5) a counterpart training program in Japan, participated by five INTI staff members.

Although the project period was fairly limited (May to December), the project's objective – "to improve INTI's SME support capability by using soft technology" – was accomplished to some degree. While INTI needs to improve its staff's capability further, it already provides new services and obtains new customers on the basis of knowledge and experience obtained from implementation of the model project.

Yet, it takes some more time to achieve the strategic goal, "to improve productivity of the target sector." Most companies that participated in the model project have produced positive results and some have increased profits. However, this is largely due to Japanese experts who have expertise and long experience. It still requires considerable time before INTI staff gains experience and becomes capable of helping the target sectors to achieve productivity improvement through dissemination of soft technology.

Specific results achieved from the model project are described as follows.

1) Improvement of INTI staff's capability

As a result of the model project, INTI staff's capability relating to production management technology has improved, with some variation among individuals. This is confirmed by comments from the study team members, e.g., INTI staff started to give explanation to beneficiary companies and prepared documents by themselves in the second half of the model project. (See the Technology Transfer Record and Model Project Report for details.) In responses of beneficiary companies to the questionnaire survey, INTI's coordination, project implementation, and support is highly valued. Thus, it appears that INTI has improved its capability in the area of soft technology to the level where companies gain confidence in its service. In particular, the study team members pointed out that INTI staff who had received training in Japan took initiative in their work after return from the training.

A problem remains about variation of capacity improvement among individuals, seemingly stemming from the difference in experience before the start of the model project, i.e., it is inevitable that a significant difference in results of technology transfer occurred between INTI staff members who had some experience and no experience (those who were hired for the model project). Furthermore, the relatively limited project period made it difficult to include special activities for training of new employees in the project. At the same time, it is not undeniable that there was a difference in the ability relating to technology transfer among experts.

2) Development of manuals for soft technology-related consulting service

Under the leadership of the study team experts, manuals for the ten themes were completed.

a. Instructions to Consultants
b. Production Engineering
c. KAIZEN Manual of Operation
d. 5S
e. Small Group Activities and Proposal System for KAIZEN
f. Cost Reduction through VA/VE
g. TOYOTA Production System
h. Quality Control in Foundry
i. Process of New Product Development
j. Finance and Accounting Manual

Most themes are designed to meet the actual needs of companies for field guidance service. The manuals include case studies in an attempt to provide practical knowledge. As a result, they were used during the model project period for technical guidance and training purposes. Note that INTI staff has not been involved much in development of the manuals, other than collection of information, and they need to revise and upgrade them in the future according to actual changes in field guidance.

3) Establishment of methodology and organization for dissemination of soft technology

During the study period, INTI did not create a new organization or department responsible for dissemination of soft technology. As this study report proposes the establishment of a new organization and its methodology, it will be up to INTI that implements the proposal. It should be noted, however, that field guidance relating to soft technology is already expanded by INTI's existing organization and several regional centers that did not participate in the model project show strong interest. Also, regional centers that have participated in the model project are proposing adoption of soft technology support service as a formal program to INTI's head office, together with a budget request, so that INTI appears to move toward the establishment of the new organization.

At the local government level, the model project has served an a precursor to promote use of technical guidance for soft technology as a new SME support service offering, and SME support schemes focusing on soft technology are expected to be used by various organizations other than INTI. Clearly, it is desirable that INTI will play a leading role in such move.

4) Increased recognition by SMEs of the need for and effectiveness of soft technology

According to the questionnaire survey of the client enterprises that was conducted at the end of the model project, all of them valued technical guidance service by the study team and INTI highly and most of them expected to receive INTI's service on a continuous basis (Table 6.16). Clearly, these companies have recognized the need for soft technology and its effectiveness. While an actual effect in terms of level of accomplishment for technology transfer varies between companies, their recognition is based on effectiveness that has been clearly felt and proven from the model project.

The presentation seminars on the results of the model project, which were held as part of the Study, were attended by a total of 742 persons (Table 6.17), including staff of trade

associations, university professors, and students who studied production management. Thus, the seminars served as a good opportunity to make effectiveness of soft technology known to a broad range of audience. In particular, the seminars presented actual results that were produced by various companies and successfully attracted attention of many other companies. And the seminars were reported by printed media, including national papers, and TVs.

INTI is already receiving requests for soft technology support from companies other than the clients under the model project. In December 2005, it received inquiry from 20 companies, including a large enterprise that requested training for its employees throughout the country. In addition, INTI receives many inquiries and proposals for joint programs from not only organizations relating to machine parts, but other local industries, trade associations, local governments, and universities as well.

Table 6.16 Questionnaire Survey to Participating Companies

	Contenido del Proyecto					Duración del Proyecto				Frecuencia de Visitas					Comunicación					Resultado					Capacidad de Expertos					Coordinación por INTI					Participación de INTI					Visitas de INTI durante Ausencia de Expertos					Asistencia de INTI durante Ausencia de Expertos					Necesidad de Asistencia Externa en el Futuro		Necesidad de Asistencia por INTI en el Futuro	
Empresas Objeto	Excelente	Muy Bueno	Bueno	Regular	Malo	Suficiente	Poco	Escaso	Muy escaso	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Excelente	Muy Bueno	Bueno	Regular	Malo	Si	No	Si	No
San Martín (4 empresas)		4					3	1				4				4				1		2	1		3	1					4				1	3					3	1				4		4	
Rosario (5 empresas)		5				5				1	3	1			2	3					4	1			4	1				3	2				2	3				2	3				2	2				3	2	2	3
Rafaela (4 empresas)		4				3	1				1	3			1	3				1	1	2			3	1				2	2					3					3	1					4				3	1	3	1
Córdoba (7 empresas)	3	4				5	2			1	3	2			1	6				1	3	3			5	2				3	4				1	4	1			1	1	2			2	3				4	2	7	
Total (20 empresas)	3	17	0	0	0	13	6	1	0	2	7	10	0	0	4	16	0	0	0	3	8	8	1	0	15	5	0	0	0	8	12	0	0	0	4	13	1	0	0	3	10	4	0	0	4	12	1	0	0	14	5	16	4

Source：JICA Study Team

Table 6.17 Seminar Participants

	Número de Participantes del Seminarios			
	Rosario	Rafaela	Córdoba	Buenos Aires
Empresas objeto	21	27	32	13
Ortas empresas	80	10	15	72
Associación/Cámara	2	8	-	14
Gobierno	5	2	2	45
Estudiantes		13	100	1
INTI	6	15	10	34
JICA (incluyendo Equipo del Estudio)	10	10	11	11
Otros	79	5	30	59
Total	203	90	200	249

Source：JICA Study Team

(2) Verification of the implementation process

1) Technology transfer to INTI

In the model project, scheduled activities were mostly carried out according to the plan. Technology transfer was conducted mainly in the form of OJT. Details of technical guidance for the beneficiary companies were determined according to the needs of each company, not INTI staff's needs or skill levels. As a result, the OJT might not be adequate for INTI staff's skills. Also, a large difference in skill and experience of INTI staff may have made it difficult to establish a unified goal or an achievable technology level. To make up for content not covered by OJT, workshops were held for INTI staff, together with manuals and reference documents. As the questionnaire survey of INTI staff indicates high evaluation on the program, Japanese experts, and communication, the level of satisfaction on the OJT-based technology transfer seems to be high (Table 6.18). Furthermore, the counterpart training program in Japan was proven to be useful for improving awareness of INTI staff.

While OJT-based technology transfer is difficult to achieve uniform results of HR development, as compared to a lecture-style one, successful results of field guidance by Japanese experts have helped to raise recognition of INTI staff on soft technology as well as motivation to disseminate it. In the future, staff training should be continued under recognition of effectiveness of soft technology and by taking into account the actual needs of companies. Future training relating to soft technology taught by INTI staff is proposed in Chapter 10.

2) Project management system

As the model project was relatively short, emphasis was placed on communication with INTI staff and beneficiary companies. Assigning one interpreter to each Japanese expert worked well to maximize effectiveness of field guidance and improve communication with the counterpart staff (see Table 6.18 for results of the questionnaire survey). Also, to monitor the overall progress during the project period, a mid-term guidance record and a technology transfer report (to INTI staff) were prepared and submitted. Finally, JICA Argentine office staff was invited to the seminars and workshops and communication with JICA head office personnel was kept by telephone or e-mail.

3) Counterpart and participating companies

Recognition of the model project by INTI head office and staff appear to have risen steadily during the project period, as evidenced by various examples: a center director participated in the project by joining an evaluation team that visited a beneficiary company; the project was introduced in INTI's newsletter; and a section to introduce the project was provided within INTI's Web site.

However, there were several problems about the counterpart staff's locational assignment. Some centers had only one staff and had to spend considerable time for coordination with beneficiary companies. Newly recruited staff without field experience was appointed as the counterpart for technology transfer and was naturally in appropriate for the role. Some counterpart staffs resigned during the model project, creating an obstacle to the efficient implementation of technology transfer, although the turnover is somewhat inevitable in consideration of socioeconomic conditions in the country.

The model project progressed smoothly in terms of participation of beneficiary companies, except for termination of service for four companies, which did not present a problem as the number of companies was set to allow for dropout of some companies. As the questionnaire survey conducted at the end of the project shows a high evaluation from participating enterprises, it is reasonable to conclude that they feel the value of participation and recognize importance of soft technology very well.

4) Other

Originally, participation by local trade associations, chambers of commerce and industry, and the central and local governments was expected, but there was no active participation partly due to a relatively low level of recognition on the project of this type and partly due to the shortage of human resource relating to the subject. While local trade associations extended cooperation by providing meeting facilities, the project never turned into an activity involving many organizations. In any case, the model project helped to increase recognition on soft technology among many organizations, as confirmed by the fact that INTI received a number of inquiries and questions on soft technology at the end of the project.

(3) Adequacy

1) Necessity

At present, Argentina is in the process of economic recovery and economic activities in various sectors are becoming brisk. However, SMEs that manufacture automotive, agricultural machinery and food processing equipment parts – target sectors of the study – strive to meet increasing demand. They cannot fulfill all orders as they have decreased production capacity and reduced the workforce due to the persistent recession. They do not have internal funds to boost production capacity and cannot expect loans from financial institutions that are not active in SME loans after the economic crisis. Under these circumstances, there is strong demand for Japanese style production management that can improve productivity and quality without making major capital investment.

2) Priority

Argentina's economic policy generally directs toward revitalization of the manufacturing sector and the securing of employment through promotion of SMEs, and in this sense, supporting the machine parts industry accords with national policy. Also, in JICA's FY2003 Country-specific Project Implementation Plan, SME promotion and job creation are listed as the means to correct regional and income inequality that is one of priority issues relating to foreign aids. This constitutes consistency with the model project under which support activities targeting local SMEs were conducted.

3) Adequacy as policy implementation tool

As discussed in "Necessity," selection of the target sectors was appropriate as a strategy to maximize effectiveness of the model project. The automobile and agricultural machinery industries are symbolic sectors in the Argentine manufacturing sector in terms of their ability to create value added and represent national pride. In contrast, the food processing equipment industry has not established its presence in the national economy (there is no trade association representing the industry) and was not readily selected as the target sector. On the other hand, the machine parts industry constitutes the supplier base, and strengthening competitiveness of the sector has significant impacts on assembly manufacturers as a whole. In other words, improvement competitiveness of local suppliers spreads effects to the entire supply chain. In this sense, this sector belongs to a well-developed supply chain (value chain) and is considered to be appropriate as the target group.

Superiority of production management techniques in Japan is globally recognized and many Argentine companies realize the fact. However, most companies know it as written or otherwise published information and do not practice any of such techniques. Furthermore,

they believed that production management techniques used in Japan were only applicable to Japanese companies or too sophisticated for SMEs to adopt. However, the results of technical guidance given to the beneficiary companies under the model project have proven otherwise, i.e., Japanese production management techniques are fully applicable to SMEs in Argentina.

(4) Effectiveness

The project goal was sufficiently accomplished. INTI staff was trained and INTI came to realize opportunity created by soft technology, creating a major impetus for propagation of soft technology in the country. This more than compensated for the inability to establish a budget and organization for INTI's formal program within the model project period, due to various reasons including INTI's status as government organization. At the same time, the model project has successfully spurred demand in the private sector, so that it is up to INTI, which should meet demand effectively.

An impeding factor for accomplishing the project goal is, as analyzed in the implementation, the imbalanced arrangement of counterpart staff, which was partly caused by the difficulty in making a major change in personnel assignment within the same fiscal year. A major contributing factor was that the project was carried out during the recovery phase of the Argentine economy and when companies reached a stage when they began to need soft technology.

As for productivity improvement of the participating companies through technical guidance, it did not constitute a major accomplishment for the model project but it definitely promoted dissemination of production management techniques and motivated counterpart staff by showing successful examples. In fact, the study team focused on a result-oriented strategy because, unless the participating companies produced measurable results, the model project would lose confidence. As a result, successful implementation of production management techniques by the participating countries has contributed greatly to the accomplishment of the project goal.

(5) Efficiency

As discussed in verification of actual results, the model project has successfully effectuated technology transfer to INTI's counterpart staff, although some variation occurred between

individuals. Also, manuals were developed and demand was created. In the future, it is expected that INTI's internal organization is established to continue HR development efforts according to actual demand. During the model project, efforts were made to produce results through various means, such as OJT, lecture, and field tour. These activities were satisfactory for the beneficiary companies and INTI staff, as confirmed by responses of INTI staff to the questionnaire survey.

External factors that worked positively for the model project are the absence of large social or economic changes during the project period and the lack of change in the counterpart.

Various activities were conducted within a relatively short period. While the questionnaire survey did not show that the project period presented no problem for participants, it was fairly short for technology transfer to INTI staff. Rather it is desirable to allow for an additional period to assist trained INTI staff in performing technical guidance service in the field. It is also desirable to conduct follow-up activities on a periodical basis after the end of the model project, say six months or one year later, from the viewpoint of effective propagation of soft technology to the beneficiary companies. In fact, many companies expressed such desire [1].

In terms of cost and benefit, the number of beneficiary companies was sufficient but an insufficient number of INTI staff who learned technology had negative impacts on project efficiency. In particular, OJT should have been carried out by assigning at least three counterpart members to each Japanese expert. Also, counterpart staff should have field experience for at least three years. In fact, these points were requested repeatedly by the study team to INTI during the study period, but it was difficult to fulfill them due to budget constraint and other reasons. INTI hired new staff for the model project and it was not sufficient in number.

(6) Lessons learned from project implementation

Generally, it is rather difficult to effectuate technology transfer of this type successfully within a relatively short period of time. The model project was able to produce satisfactory results for the participating companies because the target sectors had relatively high levels of technology and skills, not to mention the external factor (economic recovery). This can be one of major conditions for selecting the target sector.

[1] This project focuses on "continuous improvement" and the ability to continue it is a key factor. Furthermore the results of field guidance for participating companies will likely be manifested after the lapse of a certain period

In planning the model project, the study team agreed that creating successful examples of technology transfer would be critical to achieve the goal of "implanting the project that produces results within a short period of time."[2] A conventional approach would be to improve INTI staff's capability and skills to satisfactory levels before technology transfer is carried out on a full scale. Yet, it takes some time to make the counterpart organization ready for technology transfer, including the budget to finance relevant activities, and effectiveness of technology to be transferred needs to be proved for the budget to be approved. Thus, it is not feasible to ensure preparedness of the counterpart organization without any measurable results, and now that the model project has produced measurable results, INTI can develop the system to promote technology transfer. As future support is expected to start technology transfer after the counterpart organization has become ready, it will likely gain better results than the model project.

[2] "Scope of Work" agreed between Argentinean and Japanese Governments for the Study

Table 6.18 Questionnaire Survey to CP

Item	Response	8 contrapartes
Contenido del Proyecto	Excelente	3
	Muy Bueno	5
	Bueno	
	Regular	
	Malo	
Metodología del Proyecto	Excelente	2
	Muy Buena	6
	Buena	
	Regular	
	Mala	
Capacidad de Expertos	Excelente	7
	Muy Bueno	1
	Bueno	
	Regular	
	Malo	
Duración del Proyecto	Suficiente	7
	Poco	1
	Escaso	
	Muy escaso	
Frecuencia de Vistas	Excelente	2
	Muy Bueno	4
	Bueno	2
	Regular	
	Malo	
Cantidad y Calidad de Materiales	Excelente	2
	Muy Buena	3
	Buena	2
	Regular	1
	Mala	
Cantidad y Calidad de Tareas Solicitadas	Excelente	2
	Muy Buena	5
	Buena	1
	Regular	
	Mala	
Transferencia de Conocimientos Brindados	Excelente	3
	Muy Buena	4
	Buena	1
	Regular	
	Mala	
Mi Participación en el Proyecto	Excelente	1
	Muy Buena	5
	Buena	2
	Regular	
	Mala	
Comunicación entre INTI	Excelente	3
	Muy Bueno	4
	Bueno	1
	Regular	
	Malo	

Source : JICA Study Team

6.2 Model Project 2

Prior to the start of the model project, the study team agreed with SSPyMEyDR on the objectives of the proposed database on small- and medium-sized manufacturers (Bolsa de PyME) as follows: 1) promotion of subcontracting; and 2) publication of recruit information.

Bolsa de PyME will register SMEs that want to supply parts in the form of contract manufacturing and will publish their production capabilities over the Internet. Potential customers will access to Bolsa de PyME and find a supplier that meets their requirements for inquiry. Potential users of Bolsa de PyME include: 1) assembly manufacturers of finished products and components, which look for parts suppliers or job shops that perform contract manufacturing or machining; and 2) companies that want to build a production chain with others that have complementary production processes.

Data representing production capabilities of registered SMEs will include the number of employees, their job experience, factory size, machinery and equipment owned, as well as main products that are generally stored in existing databases.

Many companies in the manufacturing sector, which is in the recovery phase after the long recession, are troubled by the shortage of skilled workers, engineers and factory operation staff. To help them with recruitment, Bolsa de PyME will contain recruit information by category.

The existing company databases managed by trade associations or local governments usually face the difficulty in date update, and many of them become obsolete and incorrect over time. Functional characteristics of Bolsa de PyME, which is proposed for development, are found in its data registration and updating methods, i.e., it allows companies registered with Bolsa de PyME to register and update their data via the Internet.

6.2.1 System Development Contract

The system development contract concerning Bolsa de PyME was concluded on June 15, with the development period of three months. Relevant portions of system specifications contained in the contract are presented below. The system, upon completion, will be operated by SSPyMEyDR, and data will be published on its Web site. System security will be designed according to internal regulations of SSPyMEyDR.

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1. Basic Functions to be developed

1) Programming of Input Screen, Update/Delete of the SME data
2) Programming of Data Storing into the database and security for protection
3) Programming of Screen for searching SME data by key words and/or pre-defined list boxes
4) Interface to the Web following all the regulations required by MECON and USI of SSPyMEyDR
5) Management of membership registration/rejection by User-ID and Password
6) Integrate the Database System into the SSPyMEyDR PORTAL site
7) Link to the other authorized Web-sites if required

1.1 Special Requirement

In order to accommodate the future enhancement or enlargement of the System, Database should make independent from the logic of the applications.

1.2 System Structure

This system must be composed of an "ABM Structure", capable of generating a tool for Upload (Alta), Delete (Baja) and Modify (Modificación) processes.

In case new different processes should be added, the system can allow the addition of input fields by creating a necessary number of "ABMs", in order to adapt it for additional industrial sectors.

2. Hardware and Software environment for Program Development

In accordance with current system environment of SSPyMEyDR, following characteristics are required for developing any application programs.

2.1 Hardware

PC for the client and PC for servers should use the standard platform indicated by SSPyMEyDR.

2.2 Software

Following open source software should be used for the program development.

1) Operating System: Applications must be executed on platform Linux 2.6.4 (newest version).
2) Web Server: Applications must be executed in Apache Web Server 1.3.31 (newest version).
3) Database: Applications should work with Open Source My SQL 4.0.17

engines (newest version).

4) Programming language: Applications have to be developed in PHP 4.3.4 (newest version).

3. Specification of Data to be stored in the Database

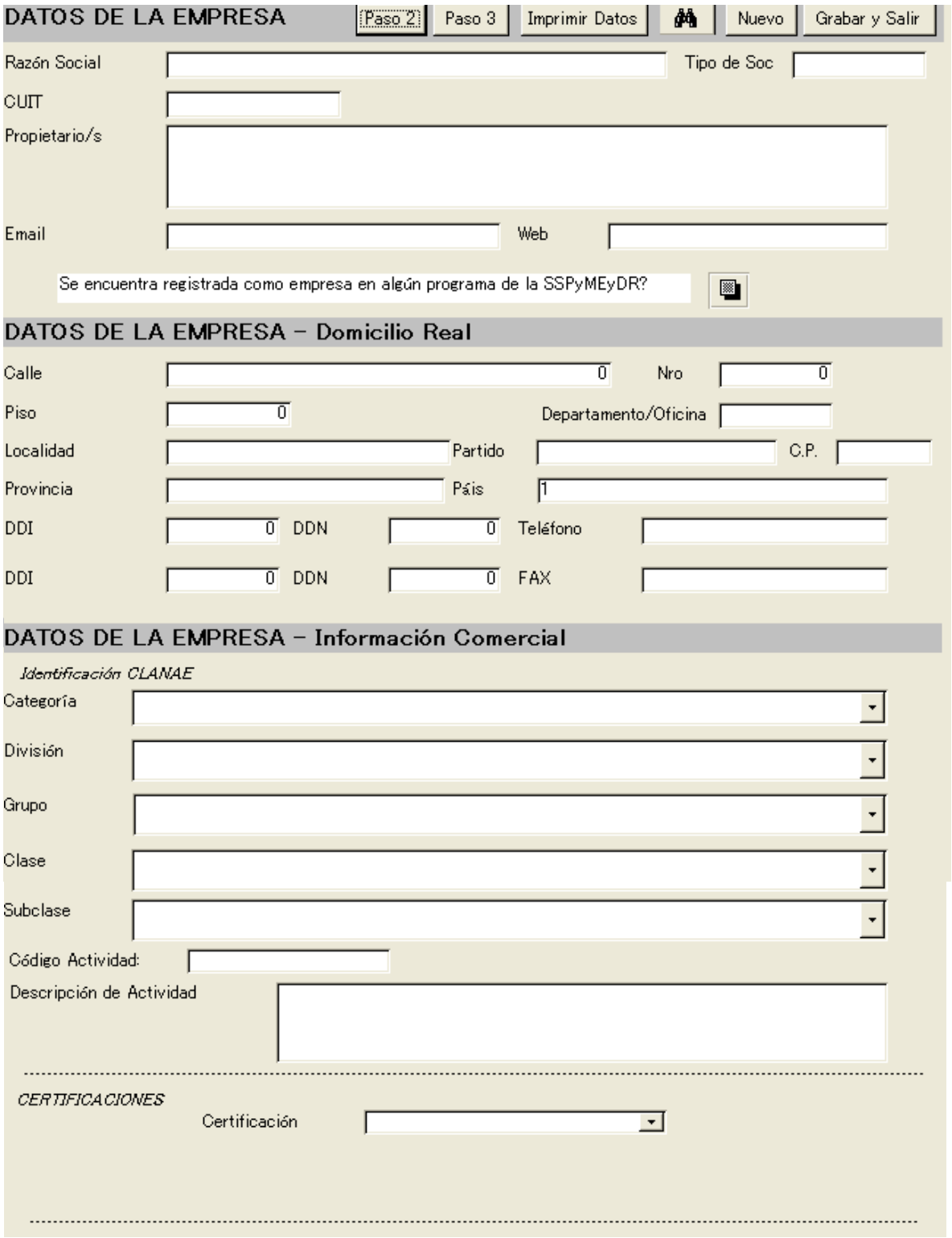
Location, Sector Category, Type of Process shall be designed using List Box Control function.

4. Languages to be used for Screen Format

Screen Menu of Registration of ID and Password, Input/Delete/Update and Retrieval shall be expressed both in the Spanish and English languages.

System development work was jointly supervised by the study team and the System Division of SSPyMEyDR. Upon the completion of an acceptance inspection on September 27, the system and documentation was delivered to the study team. The System Division of SSPyMEyDR will be responsible for technical maintenance of the database system after its completion.

The company data form is presented in the following page. Note that operation manuals for Bolsa de PyME are included in the "Report on Model Projects".


DATOS DE LA EMPRESA
Paso 2
Paso 3
Imprimir Datos
Nuevo
Grabar y Salir
Razón Social
Tipo de Soc
CUIT
Propietario/s
Email
Web
Se encuentra registrada como empresa en algún programa de la SSPyMEyDR?
DATOS DE LA EMPRESA – Domicilio Real
Calle
0
Nro
0
Piso
0
Departamento/Oficina
Localidad
Partido
C.P.
Provincia
País
1
DDI
0
DDN
0
Teléfono
DDI
0
DDN
0
FAX
DATOS DE LA EMPRESA – Información Comercial
Identificación CLANAE
Categoría
División
Grupo
Clase
Subclase
Código Actividad:
Descripción de Actividad
CERTIFICACIONES
Certificación

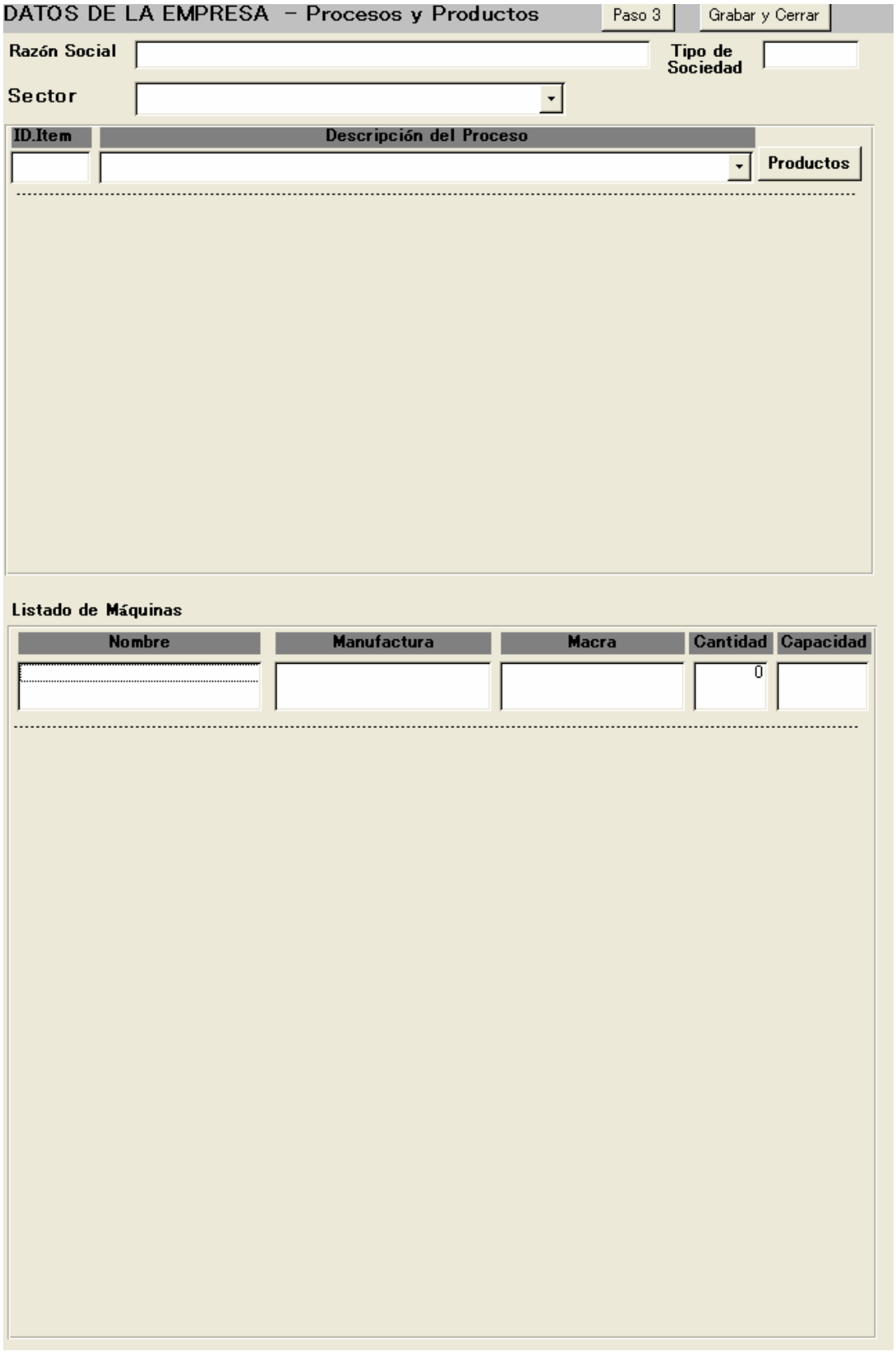
NUMERO DE EMPLEADOS

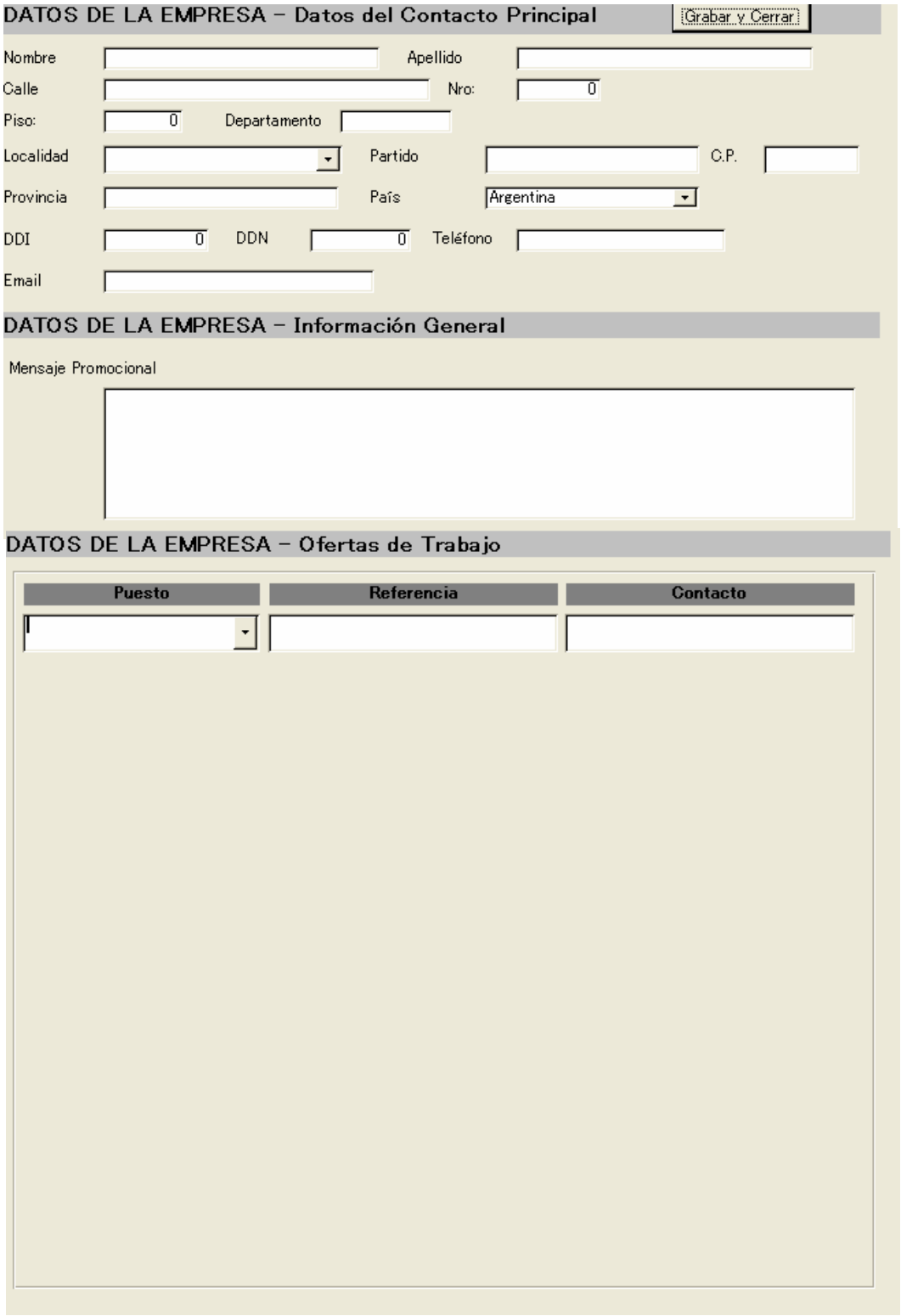
Tipo Empleado	Experiencia menor a 10 añps	Experiencia mayor a 10 años	Subtotal
	0	0	0

Superficie Total 0 m2 Superficie de Planta Cubierta 0 m2

Facturación Anual (en $) $0.00

CLIENTES PRINCIPALES


DATOS DE LA EMPRESA – Procesos y Productos
Paso 3
Grabar y Cerrar
Razón Social
Tipo de Sociedad
Sector
ID.Item
Descripción del Proceso
Productos
Listado de Máquinas
Nombre
Manufactura
Macra
Cantidad
Capacidad
0


DATOS DE LA EMPRESA – Datos del Contacto Principal
Grabar y Cerrar
Nombre
Apellido
Calle
Nro:
0
Piso:
0
Departamento
Localidad
Partido
C.P.
Provincia
País
Argentina
DDI
0
DDN
0
Teléfono
Email
DATOS DE LA EMPRESA – Información General
Mensaje Promocional
DATOS DE LA EMPRESA – Ofertas de Trabajo
Puesto
Referencia
Contacto

6.2.2 Sample Company Data Collection Contract

To ensure that benefits of the new service – Bolsa de PyME – are recognized in Argentine and its existence is widely accepted, only feasible method is to publish the database on SSPyMEyDR's Web site and invite companies to register their data by conducting continuous promotional activities, thereby to wait for growth of data and access.

Following the system development contract, a commission contract for collection of sample company data required for publication of Bolsa de PyME was concluded on June 22. The scope of service covered by the contract is: 1) collection of company data in a form under development; and 2) input of collected data to the system. The contract period is five months and the target number of companies is 300.

The subject of data collection is SMEs in the target sectors under the model project, namely automotive, agricultural machinery, and food processing equipment parts. The study area covers three provinces of Buenos Aires, Santa Fe, and Cordoba, where machine parts manufacturers are clustered and Model Project 1 has been implemented.

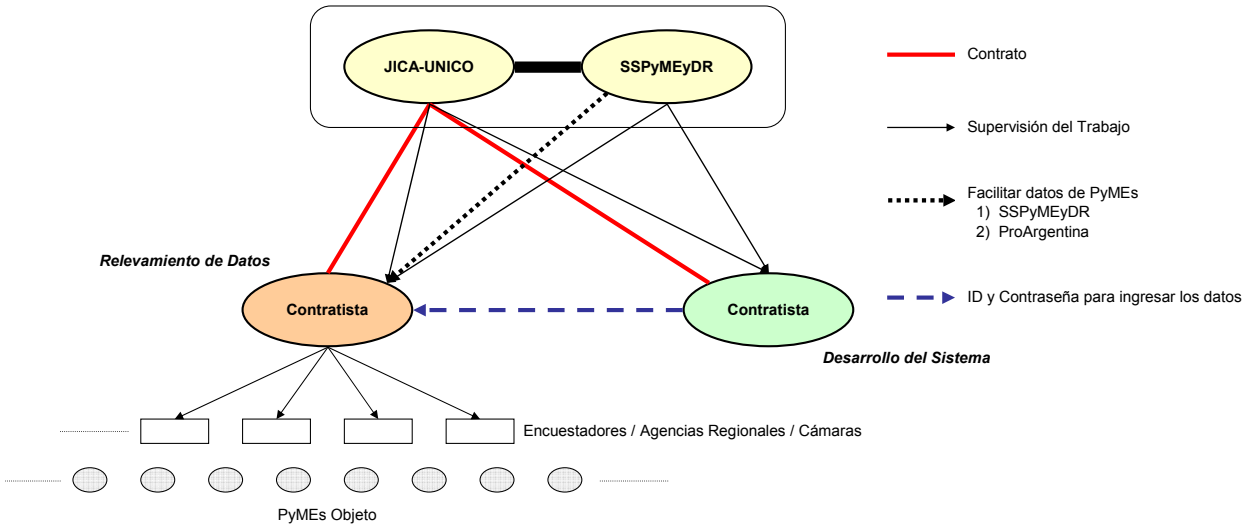
The following data were furnished to the contractor: 1) the list of companies extracted from the existing databases of SSPyMEyDR and ProArgentina and sorted by sector and area; and 2) relevant databases of trade associations and local governments, which were obtained by the study team during the basic survey.

As described in Chapter 4, the intent of the model project is as follows: SSPyMEyDR will develop Bolsa de PyME for the purpose of promoting subcontracts and publishing recruit information; Agencias Regionales de Desarrollo Productivo will use Bolsa de PyME as a SME support tool in each region; and each "agencia" will cooperate in promotional activities relating to the system as well as system maintenance.

Data collection will be carried out by the contractor's staff, who will visit each company, and it is recommended in the data collection contract to ask for cooperation of "Agencias" in the respective regions.

As in the case of system development, the data collection work will be jointly conducted by the study team and SSPyMEyDR.

Fig.6.2 presents an organization for implementation of Model Project 2 on the basis of two contracts



Source: JICA Study Team

Fig. 6.2 Implementation Organization for Configuration of Bolsa de PyME

6.2.3 Amendment of the Sample Company Data Collection Contract

The contractor started activities pursuant to the data collection contract. Note that the contractor assigned the data collection work in Rosario to ADERR by concluding an assignment contract, while the contractor's staff collected data from other areas.

After the lapse of four months, however, the data collection rate fell way below the target level and it became apparent that it was not possible to collect the rest of data within the contract period. It was mainly caused by the inability of the contractor's enumerators and "agencia's" staff to perform their work properly and efficiently, while it was difficult to promote an understanding of companies on an active database over the Internet – largely different from the existing databases – prior to the publication of the system.

The contract was extended for three months under the condition that enumerators would be increased and the staff training system would be modified. At the same time, it was decided to expand the scope of data collection to small- and medium-sized manufacturers in sectors other than the original three (automotive, agricultural machinery, and food processing equipment parts), also without geographical limitation.

Meanwhile, the study team conducted its own data collection activities as follows.

1) Data collection from beneficiary companies of Model Project 1 and those that received simplified corporate diagnosis, in cooperation of INTI that is the counterpart of the model project

2) The hiring of enumerators for corporate visit, data collection and input

3) Promotion of Bolsa de PyME at the presentation seminar on the results of Model Project 1, and invitation of companies that attended at the seminar to register with the database

4) Request for cooperation to the following trade associations by visiting them directly; as a result, they recognized the role of Bolsa de PyME and agreed to request member companies to provide data.

Asociación de Fábricas Argentinas de Componentes - AFAC
Asociación de Industriales Metalúrgicos de la República Argentina - ADIMRA
Asociación de Industriales Metalúrgicos de Rosario – AIM
Cámara de Industriales Metalúrgicos y de Componentes de Córdoba

6.2.4 Public Seminar on Bolsa de PyME

As a result of data collection conducted in method described in 6.2.3, data on 263 companies were collected and registered on the system, although the original target was not met. SSPyMEyDR formally inaugurated and launched the system on March 2, 2006 in the closing seminar of the study in Buenos Aires. A link will be established to allow users to access to Bolsa de PyME from SSPyMEyDR's Web site shortly.

The model project plan described in Chapter 5 envisaged that, after publication of the system over the Internet, the study team and SSPyMEyDR would jointly conduct promotional activities on Bolsa de PyME as part of the model project. Also, it was assumed that data on access to the system after promotion was included in evaluation of the model project. However, as collection of sample company data took longer than expected, the model project had to end when Bolsa de PyME was formally inaugurated and launched .

Promotional activity for wider use of Bolsa de PyME as well as system maintenance are proposed as action programs in Chapter 10.

Chapter 7

Benchmarking of Non-financial SME Support Schemes

Chapter 7 Benchmarking of Non-financial SME Support Schemes

SME support generally consists of two elements: 1) financial support covering the funding of equipment purchase; and 2) non-financial support relating to technology and market information. The Study primarily deals with the latter.

Needless to say, each country has its unique industrial structure as well as economic structure. Each country sets its own industrial policy according to its history and other characteristics, together with local conditions and limitations. Yet, the manufacturing industry, which is the subject of the Study, is facing the global issue of establishing international competitiveness in the waves of market opening that exposes all products to fierce competition in both export and domestic markets. Under these circumstances, it is imperative for government policymakers and organizations in any country to implement a support scheme for small- and medium-sized manufacturers to study technical support programs, schemes and results in other countries and select and adopt those suitable for the country with necessary modifications to reflect local conditions.

The benchmarking study for formulation of the action plan starts with government policies and schemes relating to non-financial, technical support for SMEs in the manufacturing sector in Japan. In essence, the Japanese scheme is a primary example that central and local governments assume a leading role in SME support. The Japanese case study is concluded with a selective SME support policy for the machine parts sector that is the subject of the model project.

Then, the benchmarking study moves to cases in Italy and Spain where favorable results are produced under a government/private joint support scheme led by the local private sector.

7.1 Non-financial SME Support Scheme in Japan

For Japan, a small but heavily populated country (its land area is 14% of Argentina and population 3.4 times) with scarce natural resources, the manufacturing industry forms the foundation of its economy and industry. This is evident from the prominent position of the manufacturing sector in the Japanese economy. For instance, machinery and machine parts accounted for 78% of the country's exports in 2002, compared to 33% for Argentina (2001).

7.1.1 Definition of SMEs

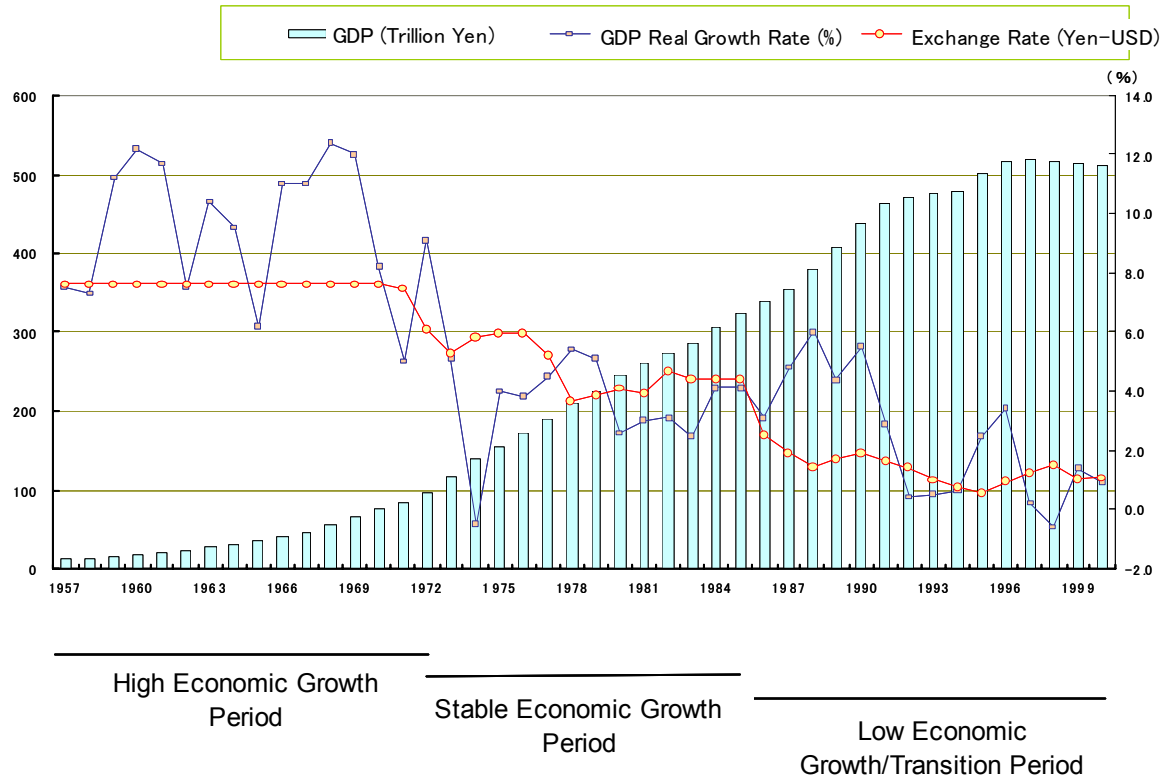
Definition of SMEs often becomes critical as it determines eligibility of a company for low-interest loans and other SME support programs. Official definitions in Japan and Argentina are identical in the number of employees while using different financial criteria. In Japan, working capital is used instead of sales because the latter is subject to business cycles and other economic conditions.

There is no significant difference in major characteristics of SMEs between the two countries, such as composition of large enterprises and SMEs in the numbers of enterprises and employees, while SMEs in Japan mainly supply parts to local assembly manufacturers that form the top layer of the pyramid structure, making a sharp contrast to those in Argentina. This difference is important when one thinks about promotion of SMEs that operate in the pyramid structure.

7.1.2 Economic Development in Japan and Basic SME Promotion Law

Fig.7.1 summarizes post-war recovery of the Japanese economy in terms of yen-based GDP, which roughly represents recovery and development phases that the country has undergone. Essentially, the impressive recovery and development process has been enabled by the sound business environment that was a fruit of relatively stable political conditions (during the same period, Argentina went through significant political changes), which allowed companies to formulate and implement long-term policies and strategies[1].

[1] The World Bank's "East Asian Miracle" published in 1993 points out that "stabilization of national economic policy is the major factor for growth."



Source: JICA Study Team

Fig. 7.1 Economic Growth of Japan

Many of Japanese multinationals that are active in the international market have started as family-operated, back street workshops and have grown steadily from small enterprises to midsize and large enterprises throughout the post-war recovery period. Today, companies managed by founders or their families account for over 90% of SMEs in Japan. Also, it is noteworthy that 43% of large enterprises in Japan are owner managed.

While many countries are dominated by microenterprises and small enterprises with a small number of medium-sized enterprises, let alone a handful of large enterprises, Japan is one of a few countries that have a relatively large number of medium-sized enterprises in the manufacturing sector. This is partially attributable to a stable political system that allows sustainable development of companies based on long-term strategy, together with an effective support system. As a large number of SMEs in Argentina are family operated over several generations, policymakers are expected to provide an environment to enable SMEs to make successful transformation to modern companies with international competitiveness.

During the post-war recovery period, Japan has chosen an industrial development strategy focusing on promotion of selected subsectors that have potential to become leading industries.

The textile industry was one of them and established its prominent position for a certain period, and so were iron and steel, shipbuilding, and chemical. The machinery industry was chosen as a priority sector in 1956 under the Machinery Industry Promotion Law, which was in effect until 1985, with some amendments (expanding the scope to the electrical equipment industry). Meanwhile, the Basic SME Promotion Law was enacted as the legal foundation of SME policy.

7.1.3 Basic SME Promotion Law

In Japan where the manufacturing sector is considered to be the country's basic industry, importance of SME promotion to support the key role of supporting industries for assembly manufacturers has been recognized and taken into account in the country's industrial policy since an early stage. The fact that development of SMEs leads to industrial development on a national scale, together with job creation and eradication of poverty, is well understood by many countries and their national development plans address the need for SME promotion. Nevertheless, not many countries have a SME promotion law that defines the positioning of SMEs in the national economy and that declares the needs for reinforcing their strengths and overcoming their weaknesses through long-term national efforts. Japan enacted the Basic SME Promotion Law in 1963, which was later than the counterpart law in the United States but much earlier than that in Europe.

The Basic SME Promotion Law defines SMEs as a key player in Japanese industry and at the same time as a vulnerable sector that operates in a dual structure dominated by large enterprises and requires government protection. The law emphasizes that SMEs play a critical role in job creation and government's active intervention is indispensable in providing a safety net for employment. Based on the law and its intent, a number of financial and non-financial policies have been implemented and a number of government agencies and organizations responsible for SME support, accompanied by actual support programs, have been created and put into place.

After the post-war recovery period and the enactment of the Basic SME Promotion Law, the Japanese economy has enjoyed strong growth, which is partially attributable to the law and accompanying support programs, at least in the areas of "correction of inequality" and "productivity improvement."

7.1.4 Amendment of Basic SME Promotion Law

As the manufacturing sector changed its nature and characteristics over times, the basic concept of SMEs and their support also changed to necessitate a major amendment to the law, which

took place in 1999.

Major changes in the business environment surrounding SMEs, including their characteristics, are summarized as follows.

- Changes in the business environment
  - Characteristic shift of manufacturing industries from mass production to flexible production (small lot, large variety)
  - Progress of globalization and increased emphasis on local economy
  - Pervasiveness of IT and emergency of the information industry
  - Decline in the number of subcontracting companies
- Diversification of SMEs and their characteristics, including those highly competitive in a niche market and those capable of planning and proposing new products and markets

The amended Basic SME Promotion Law is thought to have an intention to follow the above environmental changes. Most importantly, compared to the old law that viewed SMEs as a vulnerable sector in the dual economic structure and requiring protection, the amended law assumes an effective use of a market mechanism and self-responsibility of individual companies and proposes the following policy objectives. It positions SMEs as a key player in the industrial concentration model, who plays an active role in the national economy.

- Policy objectives under the new law
  - Nurturing and development of SMEs that have diverse capability, vitality, and the spirit of independence
  - Government intervention should have the following objectives: 1) to develop a level playing field; 2) to support self-help efforts; and 3) to provide an effective safety net.

As for division of responsibilities between central and local governments, delegation of power to local governments is emphasized to reflect close association of SMEs with local community and industrial concentration in specified areas.

7.1.5 Characteristics of Non-financial SME Support Scheme in Japan

The technical support scheme for small- and medium-sized manufacturers in Japan has the following three characteristics.

(1) Importance of government's role

Industrial policy in Japan has undergone some failures due to excessive intervention and is recently revolving around the key concepts that are being internationally accepted, namely "small government," "decentralization of power" and "private initiative." It should be noted, however, that the government's industrial policy, together with various support mechanisms, enabled manufacturing industries to make an excellent take-off for remarkable development and prosperity, and that the Basic SME Promotion Law was amended after small- and medium-sized manufacturers successfully took off in the international market.

Today, the Japanese government is striving to privatize state enterprises that create substantial financial burdens due to inefficient operation. At the same time, it continues to play a certain role in implementation of SME support programs under the new law, in addition to the planning of support policy. While this partly reflects the Japanese culture that prefers public initiative and privatization, instead of pure private initiative, it also indicates that national consensus has been developed to consider basic education and training of human resources required by industry to be as essential as school education which is indisputably government's job in any country.

(2) Involvement of public organizations in dissemination of soft technology in addition to production technology and skills

Non-financial SME support includes a wide range of technical support covering three areas, i.e., production technology (hard technology), soft technology including business/production management, and production skills such as machine operation and welding. Provision of industry and market information may be added to the three fields.

As for the three technical fields, importance of soft technology has been realized in Japan since early times and is considered as important as hardware technology and skills. In fact, the central government took leadership in disseminating soft technology through public organizations and developed a necessary support system in cooperation of the private sector. An organization to spearhead such support - Japan Productivity Centre - was established in 1955 after extensive research and study on advanced soft technology in other countries by sending a number of joint missions representing related government agencies and large corporations.

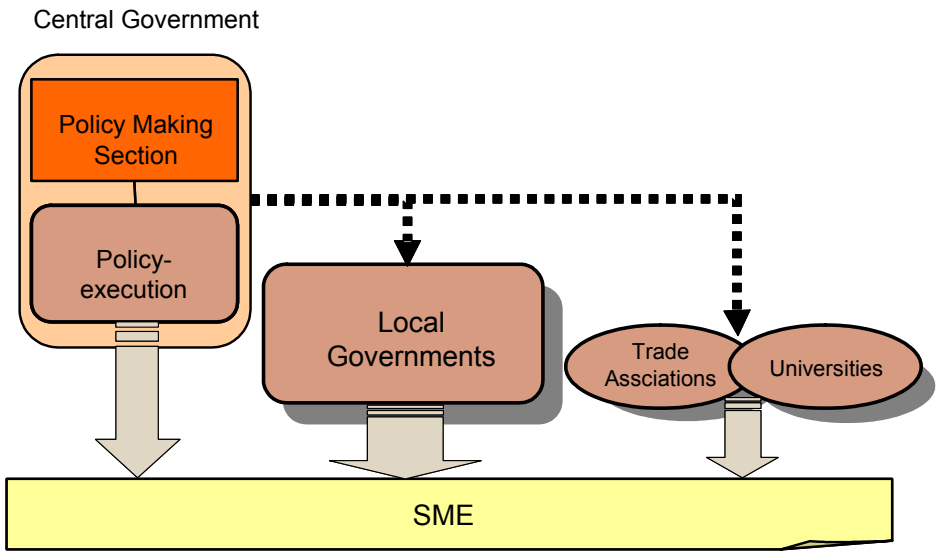
(3) Upgrading of technological capability and synergetic effect of the national certification system

The third characteristic is the presence of the national certification system in the fields of hard technology, soft technology, and production skills that are essential for the manufacturing industry. In particular, the certification system for hard and soft technologies creates professional qualification based on field experience and knowledge, in addition to engineering and other related degrees, thereby not only providing incentive for individual workers, but contributing greatly to the improvement and dissemination of technological capability in the entire country.

7.1.6 Three-tier SME Support

Fig.7.2 indicates that Japan has a three-tier SME support mechanism consisting of a nationwide support network led by the central government, a local network led by local government focusing on local needs, and individual projects initiated and/or implemented by private enterprises, trade associations, and universities, which target a specific theme or sector.

One of major characteristics of SME support in Japan is the central government's continued role in implementation of SME support and human resource development programs through responsible offices and organizations, despite the recent trend to rely on the market mechanism.



Source: JICA Study Team

Fig. 7.2 Three-tier SME Support

In the following sections, support schemes in the fields of hard and soft technologies are outlined.

Note that, as for production skills, detailed discussion is omitted here. Essentially, there are organizations responsible for skills education and training under the Ministry of Labor, which operate training institutes throughout the country. In addition, local governments have training institutes that offer programs to meet the needs of local industries.

7.1.7 Support in the Area of Hard Technology

In relation to hard technology, central and local governments and private organizations conduct the following activities.

- Central government
  - Operation and management of national testing and research organizations covering basic government service (metrics) and demand-side policy agenda (energy, natural resource, etc.)
  - National certification system of professional engineers
- Local governments
  - Operation and management of public testing and research organizations for promotion and dissemination of technology to local industries
- Private organizations
  - Industry-academia projects

(1) Public testing and research organizations

There are technical support organizations under supervision of local government, which mission is to promote local industries. They provide a variety of technical support services for local SMEs, including consultation, guidance, training, inspection and analysis, and provision of technical information.

Today, rapid technological advancement made by the private sector prompts significant changes in the role of public technical support organizations. Previously, they assumed a leadership role in technological development in a specific industry, but they are mainly engaged in joint research projects with the private sector and provision of information service. Accordingly, they deal with appropriate technology that is widely demanded by local industries, rather than advanced technology that is the realm of fierce competition in the private sector.

At present, there are approximately 170 technical support centers throughout the country, each of which has an average of 40 employees. 40% of the centers are specialized in metalworking technology. This means each of 47 prefectures in Japan (equivalent to provinces in Argentina, with each prefecture having land area one tenth or less that of a typical province and population that is twice as much as the province) has three to four technical support organizations. They are operated under control of local government but receive subsidy from the central government for operation and maintenance of facilities and equipment.

(2) Professional engineer

The professional engineer represents the most reputable and respected certification in the area of industrial technology and has history of 45 years. The certification is issued to persons who have passed a state examination. To be qualified for the examination, however, it takes at least seven years of relevant work experience for college graduates.

The professional engineer is certified for 21 categories, such as machinery, electrical and electronics, chemical engineering, metallurgy, construction, and information. The pass rate for the examination is around 15%. At present, approximately 40,000 professional engineers are registered.

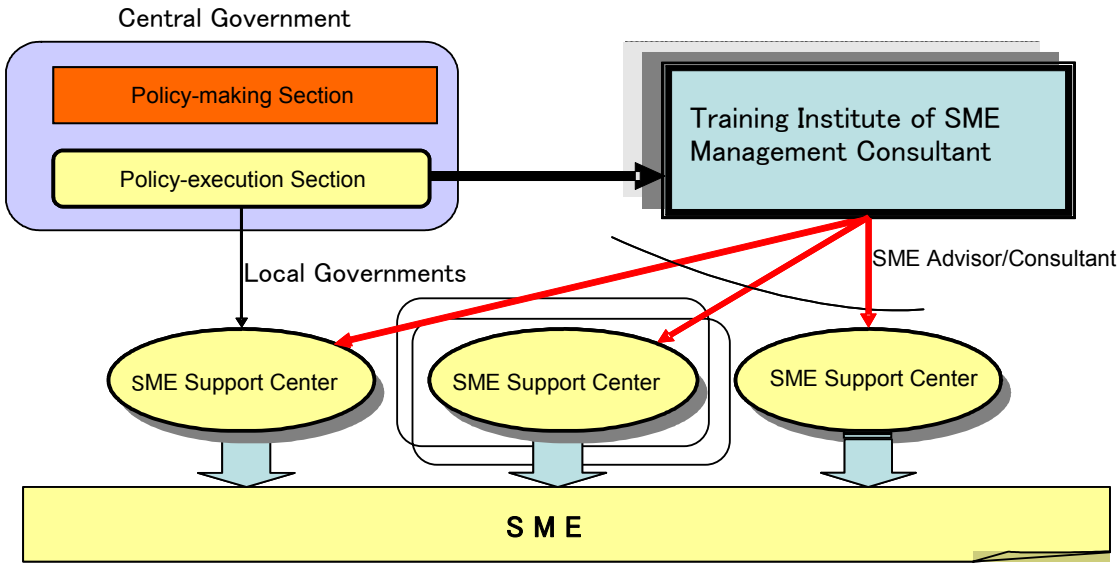
It is often the case that engineers working for large corporations obtain certification, and after retirement, they work as consulting engineers for SMEs. In this sense, they take part in technology transfer from large enterprises to SMEs.

7.1.8 Support in the Area of Soft Technology

As mentioned earlier, Japan has recognized importance of soft technology relatively early, together with hard technology and production skills, and as a result, a public support system to promote dissemination of soft technology is well developed. The government-led system is now contributing greatly to dissemination of soft technology to SMEs, as well as technical assistance by large enterprises in part of supply contract and activities of the Productivity Centre. Fig.7.3 illustrates an organizational setup of the government-led system to promote soft technology.

The Small and Medium Enterprises Agency, under the Ministry of Economy and Industry, is responsible for planning SME promotion policies and supervises the Organization for Small and

Medium Enterprises and Regional Innovation, Japan (SMRJ) that implements public support programs.



Source: JICA Study Team

Fig. 7.3 Government-led System to Promote Soft Technology

Technical support including dissemination of soft technology is provided by SME support centers that are located throughout the country and are classified into three types in terms of ownership, namely those operated by the central government, those jointly operated by local government and the private sector, and those operated by trade associations or other private organizations.

(1) Training Institute of SME Management Consultant

The institute was established in 1962 for the purpose of training extension officers of local government-operated SME support centers and has been operated for 40 years. The Organization for Small and Medium Enterprises and Regional Innovation, Japan (SMRJ) is operating nine institutes with accommodations throughout the country. Thus, the Japanese government produces SME support staff at various support centers.

The institute also offers a one-year training course for SME management consultant, which is certified by the Ministry of Economy and Industry and is specialized in consultation service concerning soft technology. A graduate of the training course is automatically certified as

SME management consultant[2].

At present, the institute is mainly attended by: 1) persons who intend to become extension officers at SME support centers; and 2) persons who take a certification test for SME management consultant. At the same time, a wide range of short-term training programs that cover various subjects are open to SME managers and field supervisors and attract a large number of attendants.

The institute plays an important role in dissemination of soft technology to manufacturers in Japan, especially SMEs, and serves as a principal player in the country's SME technical support scheme.

(2) SME management consultant

The SME management consultant is nationally certified with 50-year history and persons who have passed an official examination or have completed a one-year course at the institute receive certification. The pass rate for the examination is very low at around 3%, while the training course is very tough for many attendants who have their own work.

Originally, the SME management consultant was intended for extension officers of public SME support centers to perform corporate diagnosis and guidance service. Today, it is the most authoritative profession to provide consultation service for SMEs.

The results of questionnaire surveys conducted by the study team of SMEs in Argentina indicate that many enterprises want to receive guidance from a management consultant on the shop floor, rather than lecture-based training, which is the request made by SMEs in many countries. They also complain about presence of consultants having varied service qualities.

In Japan, national certification ensures that all certified consultants have certain levels of capability and experience, while establishing objective criteria for SMEs to evaluate quality of a specific consultant and encouraging a wider use of SME management consultant. At the same time, national certification requires the certified consultant to comply with specific rules of conduct, including non-disclosure obligation, so that SMEs need not to worry about disclosure of their confidential information to a third party in the course of consultation service.

[2] Tokyo Institute offers this course.

It should be noted, however, that consulting service for SMEs in Japan is not limited to the certified consultant, unless required so in relation to the application for loans from a government or public organization.

(3) SME support centers

The support centers provide one-stop service to solve a variety of problems faced by SMEs. As mentioned earlier, there are three types of support centers, namely those operated by the central government, those jointly operated by local government and the private sector, and those operated by trade associations or other private organizations. At present, there are eight centers of the first type, 59 of the second type, and 259 of the third type.

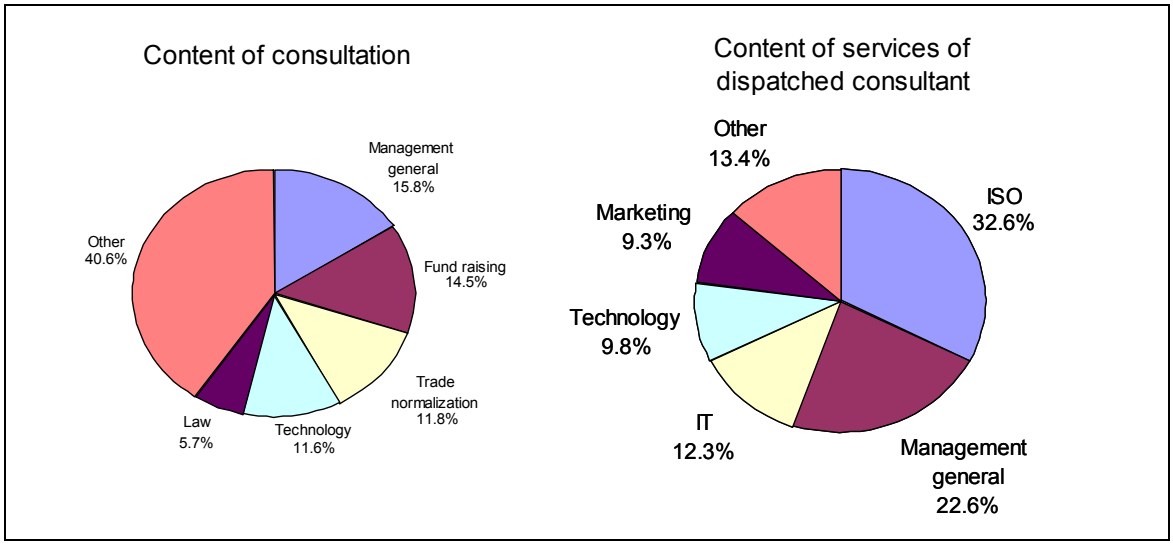
At each support center, extension officers who have received training at the Training Institute of SME Management Consultant answer questions from SMEs and provide guidance. The center sends, upon request, a qualified consultant selected from a pool of registered consultants to SMEs for field guidance. The center's advantages lie in a variety of financial and non-financial public support tools and linkage to consultants and experts including those qualified as SME consultant.

Table 7.1 presents the approximate number of requests brought to all the three types of support centers per year and the number of consultants sent by the centers. Fig.7.4 summarizes requests for consultation brought to support centers operated by local governments as well as content of service provided by consultants sent to SME clients. It suggests a significant role played by the support centers and the high level of reliance by SMEs on the centers.

Table 7.1 Activities of SME Support Centers

	By Central Government	By Local Governments	By Trade Associations
No. of contacts for advisory services	6,000 per year	85,000 per year	50,000 per year
No. of dispatches of consultants	2,500 per year	15,000 per year	4,500 per year

Source: SME WEB



Source: SME WEB

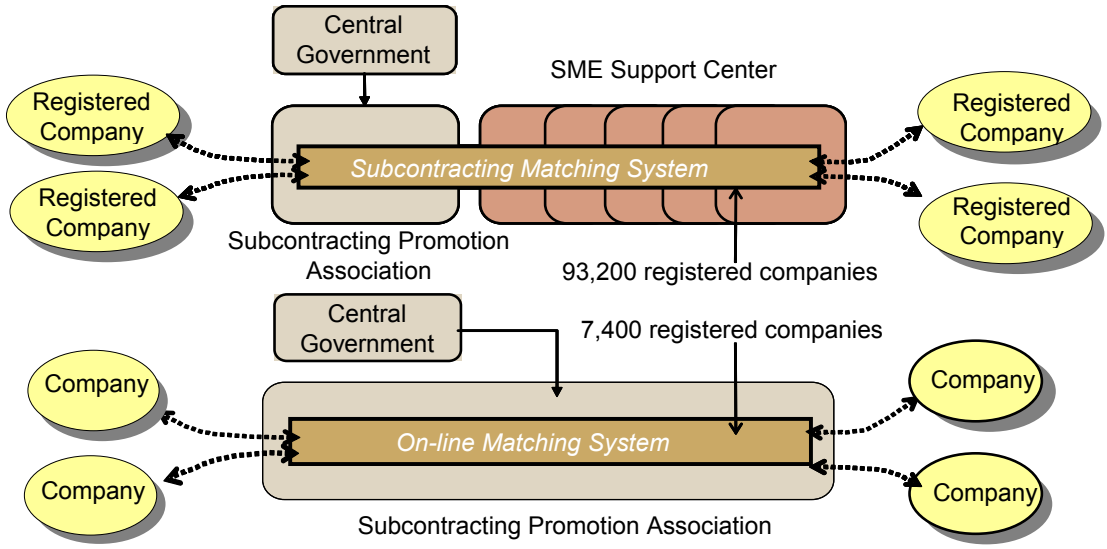
Fig. 7.4 Activities of SME Support Centers by Local Governments

(4) Subcontracting promotion scheme

This scheme is underway in Japan for the purpose of promoting subcontracts between SMEs and large manufacturers (parts procurement or contract machining or manufacturing) as well as business matchmaking between individual companies. An ad-hoc association is set up to promote subcontracts under government subsidy and is currently operating two schemes. (Fig. 7.5)

The first scheme is operated in cooperation of local government-led support centers and serves as their important support tool. Companies are registered with the association upon application and examination, and matchmaking service is offered for the database of registered companies, which is in custody of the association as confidential. At present, 93,200 companies are registered and receive service under the scheme.

The second scheme is based on a similar database of registered companies, which is published over the Internet and is freely accessible. It is relatively new and registers approximately 7,400 companies. In the future, the association will use the database in place of the above closed database.



Source: JICA Study Team

Fig. 7.5 Subcontracting Support Scheme

7.2 Support for the Machine Parts Industry in Japan

The manufacturing industry has been and is the driving force of the Japanese economy, and in particular, the machine parts subsector forms an integral part of the supplier base to support manufacturers of a wide variety of products and is the exemplar and epitome of Japanese industry with meticulous and ingenious workmanship. While the Japanese machine and machine parts industries have been growing under incessant efforts of numerous manufacturers and workers, they also owe much to a wide variety of support by the Japanese government.

As discussed in 7.1, a variety of non-financial, technical support is provided for small- and medium-sized manufacturers. This section describes major programs that have been implemented for promotion of the machine parts subsector. It should be noted, however, that, given the progress of market liberalization, promotion programs and incentives for a specific sector – which have been extensively carried out in Japan – are no longer internationally acceptable in many cases.

7.2.1 Sector-focused Support Program

As explained in 7.1.2., the Japanese government designates a specific industry or sector and provides financial assistance for SMEs that belong to the sector for the purpose of promoting accumulation of capital and technology to narrow a gap between SMEs and large corporations and modernizing parts suppliers and their operation.

The machine industry was designated for the sector-based support program in 1956. At that time, the industry was recognized as a major pillar of the national economy but its productivity was very low due to the inability of small- and medium-sized suppliers – with their aging equipment - to meet demand for mass production of parts by large assembly manufacturers.

The program targeted the following three subsectors. A new law was enacted to authorize program implementation, originally valid for five year, and was continued up to 1985 with series of amendments. Over the program period, the value of shipments (nominal) by the machine parts industry grew around twenty times.

- Basic machinery subsector (machine tools, foundry and forging equipment, etc.)
- Standard parts subsector (bearings, gears, etc.)
- Spare parts for export machinery (sawing machines, automobiles, etc.)

Under the program, rationalization plans were jointly made by large enterprises and SMEs in each subsector and the government provided part of funds required for implementation. Thus, this program is designed for the sector having a pyramid structure headed by assembly manufacturers and its primary purpose is to improve the levels of technology of second- and their-tier suppliers.

7.2.2 Support Program for Selected Companies

This program was implemented in 1963 and targeted SMEs that were exposed to competition from newly industrializing countries in a transition period to economic liberalization. The government designated target industries and formulated modernization plans for each industry as a whole. Then it provided financial support for selected SMEs that were willing to promote modernization within the above framework. The program is characterized by its focus on individual companies, rather than the entire SME sector.

The target industries were selected by taking into account the relative importance of SMEs in

each industry and the program's possible effectiveness in terms of modernization of the industrial structure and improvement of international competitiveness. Key targets and approaches to achieve them that were set forth in the modernization plans are summarized as follows.

Modernization targets

- Product performance, quality, cost, optimal production volume, production method, export targets, etc.

Approaches to achieve the modernization targets

- Equipment modernization, rationalization of management, technology and skills, promotion of joint projects and businesses, grouping of factories and related establishments, development of level playing fields, improvement of subcontract and other business relationships, market exploration, etc.

7.2.3 Program to Promote Organization of SMEs

The program provides guided policy financing for modernization projects initiated by cooperatives organized under the SME Cooperative Law, such as the grouping of factories and the provision of communal facilities. It consists of project loans and project evaluation and guidance services by qualified consultants from the planning to the operation stages. One example is the grouping of factories, for which several projects were planned and implemented, including the grouping of machining shops serving the same industry (casting, presswork, etc.) and complementary collaboration of diverse shops and suppliers to develop and manufacture automotive parts in order to maintain an optimum operation level and improve productivity.

SMEs participating in the program continued their business activities, while expecting cost reduction in relation to technology development and production activity by joining hands and sharing resources. During the program period, 458 industrial estates or 11,463 communal facilities were built and completed throughout the country.

7.2.4 Credit Insurance

This was designed to encourage renewal or purchase of production equipment by SMEs by means of loan guarantee by public organizations. The comprehensive credit insurance contract is concluded with an equipment supplier or lease company for purchase by installment or loan, or equipment lease, in order to cover one half the purchase price if it becomes default.

7.2.5 Promotion of Industry-academia-government Cooperation

This is promoted to encourage cooperation between local SMEs supported by local government, large enterprises, universities, and public technical support organizations, but not a program authorized under a specific law. To promote complementary collaboration between companies through information sharing and introduction of new technology, various activities are planned and conducted, such as the joint holding of seminars and joint research projects.

While it is not feasible for public technical support organizations to take a lead in technological advancement that is made by industries at an accelerated pace, promotion of industry-academia-government cooperation is becoming their key activity.

7.3 SMEs in Italy and Non-financial Support Schemes

As pointed out earlier, the manufacturing industry in Japan has the pyramid structure led by large assembly manufacturers that consist of the first layer and SME support is largely provided by the government sector. In contrast, the manufacturing sector in Italy is characterized by well-developed networks of highly independent SMEs and geographical concentrations of specific industries. In particular, it is noteworthy that they maintain international competitiveness under a relatively decentralized industrial and economic structure.

7.3.1 SMEs in Italy

Italy has a higher percentage of SMEs, both in the numbers of enterprises and employees, than that in Japan and major European countries, including Germany, France, and the UK. In particular, the manufacturing industry has a characteristic structure led by SMEs. They lost share in the national economy during the high growth period when large corporations in heavy and chemical industries (including machinery and metal) grew strongly, but they went through the adjustment process that was necessitated by internal factors (rise in labor cost, etc.) as well as external factors (oil crises) and regained strong presence in the entire manufacturing sector. Today, the Italian manufacturing industry maintains international competitiveness in the field of consumer goods, especially high value added products.

Region-based industrial concentration is another distinguished, major characteristic of the manufacturing sector in the country. In particular, SMEs in the same industry or sector are concentrated in the region and a large number of small enterprises form a network to practice division of labor within the region. Industrial concentration in Italy is said to have various

strengths including the following: 1) internal marketing and product development capabilities; and 2) a flexible network of companies having different skills that support the production process in each industrial area and can meet the needs for product development.

Many SMEs are family operated and do not always aspire to frantic business expansion. Rather, they opt to expand business activity by maintaining their core competence and related functions, while providing additional manufacturing functions by means of outsourcing or developing a new value chain network with other companies.

The Central Bureau of Statistics (ISTAT) has selected 199 region-based industrial concentrations on the basis of criteria set by the Ministry of Commerce and Industry and using 1995 data (although they are dominated by traditional, life-related industries). Their percentage composition by type of industry is summarized as follows.

Textile and garment	34.7%
Leather and shoes	27.4%
Furniture	19.6%
Machinery	16.1%
Metal	0.5%
Chemistry	2.0%
Paper and Printing	3.0%
Foods	8.6%
Jewelry, Musical instruments	2.0%

The textile and garment sector that has the highest number of industrial concentrations has a commonly observed structure where “organizer” companies, which are responsible for supplying finished products to the market outside the industrial area and configure a production chain by combining various suppliers, form and practice a networked division of labor with suppliers that are specialized in certain process or parts. This network is not based on a subcontract (manufacturer and captive supplier) relationship. Rather it represents equal relationships between independent companies, each of which has a number of trade partners. Viability and growth of each concentration depends on the ability of the organizer company to establish and maintain product/service differentiation in the market place, rather than price.

Similarly, regional concentrations made by the machinery sector are not of pyramid structure led by assembly manufacturers, such as automakers and their suppliers, and are largely dominated

by manufacturers of machinery with limited applications as finished products. As in the case of the textile and garment sector, concentrations of the machinery industry are composed of organizer companies (assemblers) and a a large number of suppliers. Suppliers are divided into three tiers and most of them are operated by former employees of organizer companies. Within each concentration, a tight-knit network of highly specialized companies and most of outsourcing is made to suppliers in the same region.

7.3.2 SME Support Policy and System

As Italy's industrial structure is dominated by SMEs and the country has been implementing a variety of SME policies. The country's industrial policy was led by the Ministry of Commerce and Industry up to the middle of the 1970s. Under the Decentralization Law and the Decree of Delegation that were enacted in 1975, most of power and authority relating to industrial administration has been transferred to provinces under the new concept that the principal responsibility of the central government in the area of industrial policy is to establish conditions to promote fair competition by creating a necessary legal system and framework, and that actual implementation of industrial policy should be left to local governments under partnership with local industries and trade associations. Subsequent results are widely known as evidence to prove effectiveness of industrial policy.

(1) Central government

Importance of the central government in SME policy remains unchanged after the enactment of the Decentralization Law as it continues to assume responsibility for policymaking. Changes occur in the area of policy implementation because EU funds increase share in providing the financial base for program implementation and conditions of SME support and related programs are increasingly harmonized with those of the EU. For instance, any program to protect a specific industry is prohibited by the EU for obstruction of fair competition. At present, financial support (low-interest loan) forms a major instrument of the government's policy implementation, and with the progress of decentralization, moves are underway to further promote transfer of the central government's power and authority to local governments.

Technical support programs include low-interest loan and subsidy programs to cover research costs relating to product development and improvement of the production process.

However, unlike the Japanese government, the central government in Italy does not play a leading role in non-financial SME support that involves local governments. Also there is no

national certification system for professional consultants specialized in hard and soft technologies based on field knowledge and experience, as in the case of Japan.

(2) Local government

As discussed earlier, Italy's manufacturing industry is characterized by regional-based concentration including a well-developed network of SMEs. In particular, initiatives and activities of SMEs play a central role in development of such industrial concentration, while local governments supplement them by providing support programs to meet basic needs including human resource development, information service, and technical support. In fact, most of SME support programs and organizations are deployed at province or city levels, indicating that local governments cooperate with the private sector to develop and maintain the environment to facilitate industrial activities by meeting the needs of local SMEs.

It should be noted, however, that actual support activities vary greatly among regions and mainly consist of collection and provision of information as well as research and study. In addition, trade associations and educational institutions conduct their own activities in each region. Trade associations assume an important role in policy recommendation to reflect request of SMEs and consulting service for member companies.

7.4 Non-financial SME Support Scheme in Spain

As seen in Italy, the manufacturing industry in Spain is dominated by SMEs, while there are a relatively small number of large enterprises. It is recognized that growth of SMEs holds the key to revitalization of the national economy, job creation, and the improvement of standards of living. While region-based industrial concentration seen in Italy is not rampant, the country's SME promotion policy is based on industrial support by local governments to reflect a high level of decentralization, which has progressed partially as a reaction to the previous centralized system.

7.4.1 SME Policy Framework

The country's industrial policy framework is established in the following two plans and SME promotion policy is included in them. Both plans set forth, in addition to policy objectives and principles, financial and non-financial support programs that are in line with technological promotion policies backed up by the national and EU budgets.

El Plan Nacional de Investigación Científica, Desarrollo e Innovación Tecnológica
El Programa Marco de Investigación y Desarrollo de la UE

At the central government level, the Ministry of Economy, the Ministry of Industry, Commerce and Tourism, and the Ministry of Science and Technology are engaged in industrial policy including SMEs. Note that all policies relating to technological promotion are under jurisdiction of the MST. In addition, the Ministry of Labor and Social Insurance and the Ministry of Environment are working with technological promotion in their respective fields.

The Coordination Commission (Comisión Coordinadora) is responsible for policy making, budget allocation and implementation monitoring in line with PN. As for implementation of support programs at the central government level, CDTI (Centro para el Dessrrollo Tenológico Industrial) and various support organizations under the MST, and foundations are playing a leading role.

Promotion of local industries is led by municipalities (Comunidad Autónoma), and coordination between municipalities and between the central and local governments is made by General Council of Science and Technology (Consejo General de la Ciencia y la Tecnología), which provides guidance to ensure that support schemes comply with PN, proposes actual schemes and programs, and promotes the sharing of program information owned by municipalities and the central government.

Harmonization with the EU is progressed in the areas of the support system, support programs, and quality and other certification systems.

7.4.2 Major Support Organizations

(1) Dirección General de Política Tecnológica para la PyME

This is an organization under the MST and is established in each municipality. It functions as coordinator for activities by local support organizations, both public and private, and universities.

Also, it serves as the integrated consultation desk for SMEs to respond to their problems and provides intermediary service between SMEs and support organizations as well as consultants. Its functions are similar to those of SME support centers in Japan.

(2) CDTI

CDTI is also an organization under the MST and is spearheading technological promotion and technical support in the country. Its mission is to improve levels of technology of companies in Spain. It is established in 17 municipalities. It implements its own technological promotion program under subsidy of the MST, while promoting a number of projects in collaboration with universities, some of which receive financial assistance from the EU.

In addition, CDTI provides financial support for SMEs through project implementation and evaluates feasibility of projects for which SMEs request financial support of the central government.

As for consulting service for individual companies, CDTI hires outside consultants. In Spain, there is no national certification for consultants specialized in soft technology, equivalent to the SME management consultant in Japan.

(3) Centros Tecnológicos

This is a technical support organization operated under municipalities. Compared to CDTI, the center emphasizes promotion of local industries that are specific characteristics. In some regions, several centers specialized in different sectors are operated. The center's functions are similar to those of public testing and research organizations in Japan.

The center's activities include seminars, campaigns to promote technology dissemination, industry and market information service, support program information service. It provides consulting service for individual companies by using outside consultants.

Chapter 8

Promotion and Dissemination of Soft Technology in the Manufacturing Industry in Argentina

Chapter 8

Promotion and Dissemination of Soft Technology in the Manufacturing Industry in Argentina

This chapter outlines the current state of promotion of soft technology to small- and medium-sized manufacturers in Argentina, followed by dissemination activities in Brazil.

8.1 INTI-CIME

8.1.1 CIME

INTI was established under a new law enacted in 1957 for the purpose of promoting industrial development in the country, especially providing support for SMEs to solve technical problems, and it started activity in 1958. At present, INTI is not very active in the area of soft technology and its promotion, but it initially spearheaded promotional activity by establishing CIME, as described below.

The productivity center in Europe was first established in 1951 and the Japanese center in 1955. In Argentina, the center was established in 1958, jointly by Banco Nacional de Desarrollo and trade associations. Then, under the proposal of the productivity center and the leadership of the Metal Press Industry Association, CIME was established in 1959. (Note that the original name, Centro de Investigaciones del Metal Estampasdo, was changed later to Centro de Investigación de Métodos y Técnicas para Pequeñas y Medianas Empresas.)

CIME was established under the belief that promotion of soft technology is indispensable in achieving the goal of providing effective technical support for SMEs, as learned from experience in many industrialized countries. Originally, there was the lack of understanding of soft technology and its importance, but the situation changed favorably after CIME staff had returned from training in the Netherlands. Training courses and seminars were widely held and technical support came from Ford Foundation, the OECD, and the UNIDO.

CIME's activities, from the beginning, focused on dissemination of management techniques to SMEs through direct guidance for or workshops and seminars targeting SME owners and managers, covering the following field.

- Corporate diagnosis
- Business startup
- Job management
- Production planning and management
- Marketing
- Export promotion
- Basic soft technology
- Organizational chart
- Middle manager education
- Quality control
- HR management
- Sanitation management
- Cost management

In 1965, the Argentina Productivity Center trained a group of consultants that were specialized in guidance and consulting service for SMEs. The group was later merged with CIME and renamed as AGE (Asesores en Gestión de Empresa). It conducted factory diagnosis, and made recommendations for improvement of productivity and competitiveness on the basis of findings from the diagnosis, and provided support for implementation of recommended actions. Its scope of service included factory layout, job management, production management, and maintenance. Note that the Argentina Productivity Center ceased its operation later and does not exist.

CIME was very active in the initial stage and expanded its operation to other regions. The first regional center was established in Rosario, which was inaugurated in 1964 as CIME's local center specialized in business management and soft technology. Then in 1974, INTI's regional center, CITSAFE (Centro de Investigaciones Tecnológicas de la Provincia de Santa Fe), was established and incorporated CIME Rosario Center.

8.1.2 Rosario

CIME in Rosario became stagnant for a specific period after it had become part of CITSAFE, and it was reactivated again after AGE consultants had joined. Its activities include corporate diagnosis, guidance in the areas of industrial and soft technologies, and the holding of training programs and seminars. One of the programs was PATI (Programas de Asistencia Técnica Integral para la Formación de Empresarios de la Pequeña y Mediana Industria) held in Pergamino, Reconquista and Rafaela.

A major issue relating to technical guidance for SMEs is the shortage of experts who can provide effective consultation and advice. To improve the situation, PATI was conceived by AGE consultants and its objectives are as follows.

- To improve productivity of SME managers through introduction of soft technology.
- To promote linkage between SMEs to ensure smooth dissemination of soft technology

among them.

- To foster SMEs as the key to job creation and regional development.
- To nurture company groups that realize their role in regional development.

PATI was implemented in two stages.

First stage: Training

A 21-day nighttime training program was conducted with an emphasis on problem finding and solving techniques. During the period, a consultant visited each participant's factory in operation and provided guidance by applying the techniques taught in the program.

Second stage: Self-diagnosis group

Companies that had completed the first stage were grouped together according to a common issue facing them. Each group consisted of 10 – 12 companies. Initially, participants conducted self-diagnosis on their factories under the consultant's guidance and advice. Based on the results of the self-diagnosis, the consultant picked a theme or issue for each group to be tackled jointly by member companies and a company was selected as a model case for which all the member companies worked together. In the process of mutually learning problem solving methods and techniques, participating companies were able to understand their problems, identify a cause, and propose a solution. As mutual trust was established in the group, they began to tackle with more complex and difficult issues, including factory layout, job design, and organizational and financial issues. The group's activity continued for 18 months or longer.

PATI was conducted between 1980 and 1986, and approximately 30 companies participated. Of total, 15 companies continued their activities for nearly two years after a consultation fee had been charged. Also, PATI's activities led to the formation of company groups and the construction of an industrial park in Rafaela.

In addition to PATI, CIME conducted an activity to promote linkage between companies. "Bolsa de Subcontratación", organization to arrange matchmaking between buyers and vendors (subcontractors), was operated on an experimental basis between 1981 and 1982. The matchmaking service was conducted at an office staffed by a manager and a secretary. Cards recording potential vendors and vital data (equipment list and utilization rates, etc.) were maintained and used to introduce candidate companies to companies that looked for vendors and visited the office. Companies were supposed to contract the candidate companies directly.

The program was financed by donations from sponsor organizations and companies.

While "Bolsa de Subcontratacion" was conducted partially for the purpose of INTI's promotion, it was intended as a model project for promotion of linkage between local companies. The Bolsa staff visited companies for promotion and approximately 170 companies were registered. However, the program failed to continue or expand due to problems relating to funding and updating of corporate data.

Note that the development of "Bolsa de Subcontratación" by UIA and SSPyMEyDR, under assistance of UNIDO, was commenced ten years after the program.

CITSAFE has been implementing several programs in collaboration with the central and/or local governments, one of which was carried out under support of the German government between 1996 and 1997, entitled "Programa Demostrativo de Asesoramiento para Pequeñas y Medianas Empresas para el Desarrollo de Sistemas de Aseguramiento de la Calidad ISO 9000." The program was designed to support certification of ISO 9000 and a company in Rosario was selected as a model case. CITSAFE, jointly with DAT (Dirección de Asesoramiento Técnico de la Prov. de Sta. Fe) in Santa Fe, held workshops and seminars covering a wider area of subjects, including quality control and 5S.

Later, CITSAFE's activities expanded to Santa Fe but dwindled due to major changes in economic and political conditions as well as the decrease in staff, and it was merged with other organization in 1997 to become CEMROS (Centro Multipropósito Rosario de INTI), with its official name being INTI-Rosario.

With the decline of the manufacturing industry in the country since the late 1990s, CIME's activity subsided and only two original members of AGE remain at INTI.

After 1998, however, CIME has energized again due to the increase in demand for support service relating to ISO 9000 certification and as a result of technical assistance by Japanese experts. It started promotion and dissemination of the Japanese production management system under JICA's assistance and is currently implementing "Programa de Mejora de Productividad en PyMEs".

At present, INTI's SME support relating to soft technology is not very active, but CIME's activities seem to have been inherited by Rosario.

8.2 SSPyMEyDR

While SSPyMEyDR does not have any program to provide direct guidance for SMEs, it operates an incentive program to allow partial tax reduction of training costs and a subsidy program for implementation of projects relating to soft technology.

8.2.1 PRE – Programa de Apoyo a la Reestructuración Empresarial

This is designed to improve competitiveness of SMEs through a variety of services provided by outside experts and is financed by the central government, BID, and individual companies. Subsidy covers up to 50% of consultation fees due to experts.

The subsidy is approved upon application with detailed project description. PDE (Proyectos de Desarrollo Empresarial) lists the areas of guidance relating to business management and soft technology, including the following.

- Management strategy and financial analysis
- HR management
- Market development, market study, customer service, and advertisement
- Production management and pollution control
- Product inspection and quality control

Actually, 80% of projects approved as PDE are related to ISO 9000 certification, and the remaining 20% to soft technology.

8.2.2 DIRCON

DIRCON is a directory of experts and consulting firms managed by SSPyMEyDR, which are registered upon application and after the review process that takes into account experience and other factors. To obtain the PDE approval, experts and consulting firms hired by SMEs must be registered with DIRCON. SMEs that intend to implement PDE under PRE's subsidy need to search the directory for a qualified expert.

At present, approximately 6,500 experts and consulting firms are registered and their areas of specialization include business management, HR management, production management, marketing, finance, and quality control.

8.2.3 Agencias de Desarrollo Productivo

As explained in Chapter 1, this is a nationwide network of "agencies" promoted by SSPyMEyDR to encourage linkage between the central government, local governments, and the private sector. Each "agencia" is a non-profit organization jointly operated by the public and private sectors with mission to revitalize local economies and create employment opportunities through the systematic development of SMEs. Its core functions are to introduce subsidy programs of local governments and SSPyMEyDR and assist applications, while it holds training courses and seminars by hiring outside experts.

8.3 Local Government

In Argentina where decentralization of power is highly progressed, local governments – both provinces and municipalities – initiate and implement SME support programs. Generally, they are similar to PRE implemented by SSPyMEyDR and are designed to grant subsidy to projects requested by individual companies and approved by local government.

In particular, Province of Buenos Aires has its own consultant registration system and makes the list of registered consultants available to the public, of which consultants specialized in soft technology represent the majority. Also, a corporate guidance program by registered consultants, called Programa Experiencia PyME is conducted. DAT (Dirección de Asesoramiento Técnico de la Prov. de Sta. Fe) of Santa Fe, which has industrial concentrations, has its headquarters in Rosario and promote technical support for private enterprises, including soft technology. The joint program with CITSAFE has already been mentioned.

At a municipal level, City of Buenos Aires and City of Rafaela vigorously implement SME support programs. Buenos Aires provides factory improvement programs, jointly with other organizations, in addition to the preparation for ISO 9000 certification. It also has a scheme to conduct factory diagnosis with free of charge, identify problems, and recommend a qualified expert. In Rafaela, Centro de Desarrollo de Rafaela conducts activities to disseminate kaizen and 5S activities.

8.4 Trade Associations

Trade associations in Argentina are classified into the following three grades.

- First grade: Sector-focused cámara or asociación, of which individual companies are members
- Second grade: Federación that organizes cámaras and asociaciones
- Third grade: UIA (Unión Industrial Argentina)
  CGI (Confederación General de la Industria)

Led by UIA and CGI in the third grade, a large number of national and regional organizations provide a wide range of services for member companies. However, soft technology is mostly taught in non-serial training courses and seminars, while few programs support factory improvement directly by applying soft technology.

Notably, up to the early 1990s when the manufacturing industry came to stagnation, CGI took a lead in dissemination of soft technology in Argentina, together with INTI-CIME mentioned in 8.1.

CGI was established more or less the same time as UIA and its member companies are mostly SMEs. On the other hand, UIA has membership of large corporations in Argentina, including auto assemblers. Under CGI, sector- or region-based federaciones in the second grade, together with sector-based cámaras in the first grade, are participated as members. Registered cámaras include electroplating and automotive parts, but mostly local industry sectors.

Since the 1980s, CGI has been taking a lead in dissemination of soft technology in Argentina, particularly the TQC move, according to government policy and under assistance of Japan (AOTS), Canada, and Germany. Vigorous activities were conducted, e.g., it published its own journal and sent corporate representatives to Japan for learning the Japanese style production management system, together with seminars being taught by Japanese and other foreign experts. Local experts who had overseas training and experience taught training courses and provided field guidance at factories. Meetings to promote exchange between companies were organized, as well as presentation meetings to create opportunity for member companies to talk about their kaizen experience. At that time, CGI operated Instituto Tecnológico and planned and implemented a variety of events for education and dissemination of technology. It also conducted jointly projects with INTI-CIME.

Then, the manufacturing industry in Argentina went to stagnation and decline due to frequent changes in industry policy caused by series of political changes and the increase in imports during the late 1990s. Meanwhile, INTI-CIME managed to continue activities in Rosario, which are coming back gradually. In contrast, CGI discontinued its activity and Instituto

Tecnológico remains idling.

A trade association that is relatively active is Asociación Empresarial de Rosario. Its activities include corporate diagnosis, the SWOT analysis, and guidance for improvement, followed by the monitoring of the company's performance and training for employees.

8.5 Support Programs by Large Enterprises

Soft technology is generally derived from extensive production experience on the shop floor, including trials and errors. Many of well-known production management tools were originally conceived, tested and verified by individual companies. Then they were adopted by other companies and have become industrial standards. More precisely, large enterprises transferred production management techniques to SMEs in the form of technical guidance for subcontractors, which were refined and adapted to a wider range of applications, thereby allowing them to be disseminated to other industry sectors.

Assembly manufacturers generally have technical guidance programs for subcontractors in order to establish a reliable supplier base around their assembly plant. The guidance programs are generally related to production management at factory, such as quality control, delivery schedule control, and inventory management. In particular, technical guidance programs for local subcontractors conducted by foreign-affiliated assembly manufacturers have been playing a significant role in introduction and dissemination of new soft technology to various countries.

Examples of technical guidance programs for subcontractors by large enterprises in Argentina are those by Renault, French automaker, and Techin, local manufacturer, which are summarized as follows.

8.5.1 Renault

In 1990, Renault established "Instituto de Formación en Calidad Total" in Córdoba for the purpose of disseminating TQC techniques. Originally, the program covered its subcontractors. Later, it was made available to other local companies that showed interest.

The program was conducted in Cordoba (five class rooms accommodating 110 persons and other training facilities) and Buenos Aires (two class rooms). Its subject was limited to field production management, including group activity, QC circle, and kaizen, although there were

some requests for other subjects such as marketing. Instructors were Renault employees and outside experts who long taught internal training courses. As there were adequate textbooks in Spanish, English materials were translated. Participants were largely limited to SME owners but managers were accepted in response to request by participants.

"Instituto de Formacion en Calidad Total" continued the training program and was received well by participants, but its activity discontinued when the national economy slumped and has not been resumed to this date.

8.5.2 Techin

The company operates a technical guidance program, called "Plan ProPymes", which was started in 2002. It set the goal of tripling sales through import substitution and export promotion, which has been mostly accomplished. The program was participated by approximately 250 SMEs, including Techin's customers in various sectors (such as agricultural machinery, automotive parts, and household goods) and subcontractors.

The core element of support under "Plan ProPymes" is to provide loans for capital investment, mostly used for purchase of new equipment by SMEs that participate in the program. Also, the program has been assisting product exports by customers by using Techin's foreign bases. Furthermore, factory diagnosis and field guidance have been actively conducted, jointly with universities, to support quality control and kaizen activities of participating companies, which also conduct internal employee training, under INTI's cooperation in some cases.

8.6 Universities

Many universities offer seminars on quality control techniques and ISO certification for companies, but a few provide field guidance on the shop floor, as summarized below. Actual results of these guidance programs are not known.

CEINDEPRO (Centro de Investigaciones para el Desarrollo Productivo) of Buenos Aires National University aims to develop interface between technology and management in a manner directly connected to industry's development, and its activities include corporate diagnosis and guidance services directly provided for companies.

OAPLO (Organización Argentina de Producción Logística y Operaciones) of National Institute

of Technology - Córdoba has a pool of experts who can provide field guidance for both large enterprises and SMEs and in a wide range of fields including the following.

- Quality control
- Inventory management
- Sales management
- Physical distribution
- Supply chain management (SCM)
- Product-related technology
- Production technology
- Outsourcing
- Benchmarking
- Plant layout
- Production organization
- Production planning
- Maintenance
- Pollution control measures

As discussed above, promotion of soft technology – essential for the manufacturing industry in Argentina – has a relatively long history. In particular, a number of programs and projects to disseminate soft technology were carried out in the 1970s and 1980s under the leadership of INTI-CIME and CGI, but activities have faded and remain stagnant.

At present, support programs are limited to the subsidy program for technical support by personal consultants and seminars conducted by universities, whereas there is no national organization that provides field guidance using soft technology in a systematic way, which is most needed by SMEs.

In the next section, principal organizations responsible for promotion of soft technology in Brazil and their activities are summarized.

8.7 Soft Technology in Brazil

Compared to SMEs in Argentina, those in Brazil enjoy much more opportunities to receive support relating to soft technology. All support organizations are operated as non-profit organizations and there are a wide range of support organizations and programs that aim for dissemination and guidance for soft technology and the Japanese production management system.

8.7.1 IBQP

IBQP (Instituto Brasilero de Calidad y Productividad) is considered as a principal base of nationwide moves for productivity improvement in Brazil and is spearheading promotion and dissemination of soft technology by providing related support for individual companies.

IBQP in Paraná launched a technical cooperation project in 1995 under the agreement between the Brazilian and Japanese governments. Under the project, technology transfer in the whole spectrum of soft technology, including theories, methods, technology, and experience, was carried out by Japanese experts for a five-year period, and IBQP sent trainees to Japan. IBQP publishes the journal that provides information on corporate services, training programs and sponsored events that are conducted under the technical cooperation project.

Also, IBQP sponsors the Latin American Network on Productivity (Red Latinoamericana de Productividad) and promotes the exchange of experience and know-how and a joint training program for member countries. CEMROS of Rosario participates in the network by representing Argentina.

8.7.2 SENAI

Activities of SENAI (Servicio Nacional de Asistencia a la Industria) are similar to those of IBQP and emphasize dissemination of management technology and techniques as well as productivity improvement.

Originally, SENAI was started to provide skills training for workers of microenterprises. As its activity base was expanded nationwide, the scope of coverage was extended to production technology and quality control, going beyond skills training to management training. After the economic crises in the 1980s, SENAI decided to become a technical support organization covering advanced technology and received technical and financial support from overseas. In the 1990s, it was ready to serve as a integrated technical support organization covering both hardware and soft technologies in Brazil.

SENAI operates laboratories throughout the country to provide a wide range of services for companies, including production technology, applied technology, testing, and calibration. It also performs corporate diagnosis and guidance in the areas of quality control and productivity improvement.

8.7.3 SEBRAE

SEBRAE (Servicio Brasilero de Asistencia a Empresas), which started activity in 1972, has been conducting a wide range of activities nationwide to support microenterprises and small enterprises and to promote job creation, including management training, technical guidance,

intermediary service for loan programs, promotion of linkage between companies, and the hosting of exhibitions and other events. It is mainly financed by donations from companies.

Organizationally, it consists of various provinces, including training, regional development, marketing, corporate guidance, soft technology, and quality control. It has branch offices in all provinces and operates approximately 600 support offices.

8.7.4 Other

In the field of quality control, "Asociación Brasilera de Control de Callidad" forms OLAC (Organización Latino-Americana para la Calidad) in cooperation of counterpart organizations in Europe and Latin America. It boasts a membership of 3,000 throughout the country, including state enterprises, private enterprises, experts, and students, and it provides information on quality control by publishing its own newsletter.

In the field of quality control, UBQ (Unión Brasilera para la Calidad) also has a long history and is very active.

Chapter 9

Basis of Action Program

Chapter 9 Basis of Action Program

9.1 Positioning of SMEs in the National Economy

In developing and proposing an action program for revitalization of small- and medium-sized manufacturers, the desirable role and positioning of SMEs in the national economy is analyzed and summarized below.

1) While SMEs are often labeled as a vulnerable sector in comparison to large enterprises and their sheer size, they play an affirmative role in sustaining the national economy, which cannot be expected from large enterprises. Its role is not simply limited to a subordinate one by serving a niche market that cannot be covered by large enterprises, and rather, dynamic activities of SMEs that hold a dominant share in the industry are the foundation to energize the national economy.

2) SMEs also play a significant role in terms of job creation. The bulk of employment opportunities are created by startup and growth of SMEs and lead to the stabilization of the people's livelihood and poverty reduction.

3) Compared to large enterprises, SMEs can make business decisions quickly and are thus suitable for flexible production (small lot, large variety) that is the latest trend in the manufacturing industry. This means the manufacturing industry must be highly flexible and responsive to the changes in the market trends. In this connection, SMEs and a flexible network formed by SMEs have a clear advantage over large enterprises. In particular, SMEs that are specialized in their core competence can create a new market by sensing niche demand quickly and supplying a new product timely.

4) SMEs are closely associated with a local area where they operate, and as a result, they inherently form the core element of regional economy and industrial concentration. Revitalizing SMEs therefore serves as a driving force for the local economy and contributes greatly to the local community. As importance of local economy is recognized once against the backdrop of globalization, SMEs are expected to play a crucial role.

9.2 Small- and Medium-sized Manufacturers in Argentina

Generally, small- and medium-sized manufacturers are classified into subcontractor-type parts suppliers, independent parts suppliers, and SMEs forming local industries.

(1) Subcontractor-type parts suppliers

Subcontractor-type parts suppliers constitute the basis of the industry of pyramidal structure topped by assemblers (often transnational).

Assembled products such as machinery are made up of diverse components and parts. In the production chain dominated by the structure consisting of assemblers and multiple layers of suppliers (subcontractors), the assembler can procure parts from three sources: 1) procurement from subcontractors (mainly standard parts); 2) contract manufacturing or machining of internally designed parts; and 3) internal processing (production) of parts that require frequent discussion on specifications with the supplier, parts that require strict quality control and delivery scheduling, and large parts, or purchase from the supplier that is located in proximity.

For assembly manufacturers, competitiveness is governed by geographical arrangement of each production process and the established internal organization and inter-company relationship. Japanese and other multinationals build up and maintain an elaborate production chain that takes advantage of differences in wage and infrastructure between countries.

Traditionally, the relationship between the assembly manufacturer and the subcontractor (sometimes the captive supplier) is based on a long-term contract with fixed terms and conditions. Under this arrangement, the assembler provides technical assistance for the subcontractor with the same care as practiced in the internal production line, for the purpose of improving quality of finished products, while demanding the subcontractor to rationalize its production line and process. A typical example is seen in the automotive parts industry that strives to improve hard and soft technologies so as to align their operation with the final assembly line while meeting demand for mass production of standardized parts. As a result, parts suppliers serve as supporting industries for the large assembly manufacturer and form a local concentration around it.

On the other hand, there are job-shop type subcontractors that do not have a long-term contract with an assembly manufacturer, and many of them are specialized in a specific type of essential technology or processing technology and win a supply contract for special parts that are not designed for mass produced machinery like automobiles. In this case, the relationship with the assembly manufacturer is much less captive to permit the development and maintenance of their own production process and production management system.

Basically, the traditional subcontract relationship still continues in many assembly-type

industries, but its stability is increasingly threatened as assembly manufacturers follow the global sourcing trend under the current waves of market opening and globalization. This means, assembly manufacturers opt to purchase parts from any source that meets their requirements, rather than relying on the fixed subcontract relationship, and at the same time, they demand a closer cooperation from selected suppliers, which are expected to participate in the product development process.

Meanwhile, SMEs also pursue new types of relationship with assembly manufactures, such as the formation of a supplier group led by a company having assembly capability by integrating smaller shops with a single function as second- and third-tier suppliers, and the formation of a consortium of several SMEs to participate in a product development project of a large assembler, where a technology company with R&D capability acts as a project coordinator.

(2) Independent parts suppliers

There are parts suppliers that do not have a fixed contractual relationship with the same assembly manufacturer. They are classified into two types, namely those that are truly independent on the strength of proprietary technology, and those that cannot establish a long-term relationship with assemblers.

In Japan, the first group is composed of SMEs that are specialized in value added products, such as prototyping, and those that have a dominant share in a specific market with proprietary technology. This group has been growing in number and presence within the Japanese manufacturing sector.

Machining and other essential technologies based on skills that require experience are traditionally possessed and maintained by SMEs, and many of them are specialized to form a specific domain and a combination of several technologies is required to make a product – parts – that cannot be made by a single company. Thus, independent parts suppliers in the first group need to form an industrial concentration and can benefit from it. There are various examples of industrial concentration in a specific area, which enables a group of companies to leverage their proprietary technology and improve overall technology levels to serve the customer better by ensuring technological accumulation and information sharing.

In Argentina, the first group represents a minority share of independent parts suppliers and the majority belongs to the second group. Typical examples are second- and third-tier suppliers that cannot establish a stable contractual relationship with customers, those supplying the REM

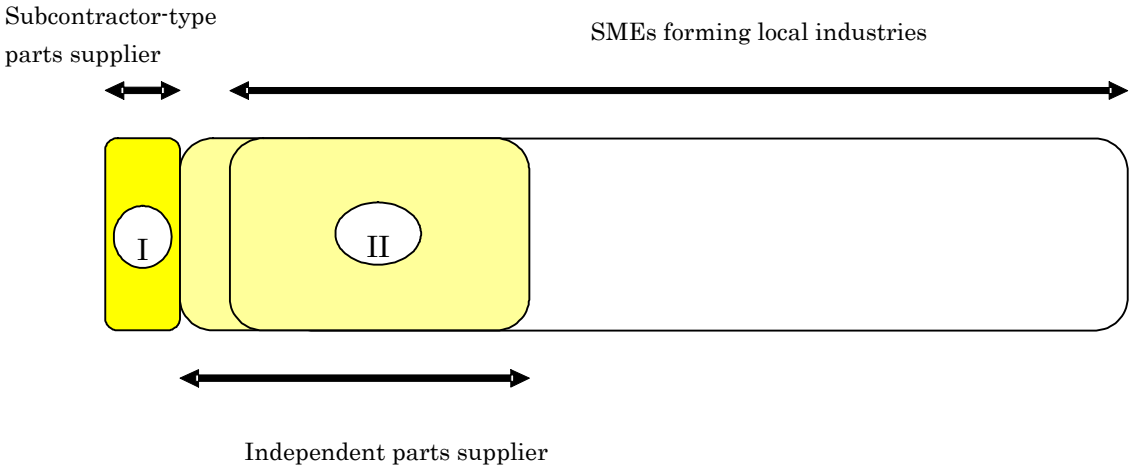
(replacement equipment manufacturing) market, rather than the OEM market, and small- and medium-sized manufacturers of machine parts for consumer goods.

(3) Local SMEs forming local industries

Belonged to this category are SMEs that constitute a local industry specialized in manufacture of specific consumer goods, such as garment, furniture, shoes, and consumer equipment.

Notably, local industries that have traditionally been serving the domestic market can no longer remain shielded from the international market where the free market system becomes pervasive, and as a result, they are required to compete with the waves of imports. At the same time, the new market environment creates export opportunities for competitive products.

Fig. 9.1 shows a conceptual view of the composition of subcontractor-type parts suppliers, independent parts suppliers, and SMEs forming local industries.



Source：JICA Study Team

Fig. 9.1 Small- and Medium-sized Manufacturers in Argentina

Subcontractor-type parts suppliers having a long-term contractual relationship with assembly manufacturers represent a very small segment (shown as “I”) in the figure. Within the group of independent parts suppliers, SMEs serving the domestic and export REM markets are partly overlapped with SMEs forming local industries (shown as “II”). Most of parts suppliers continue to operate under unstable relationship with customers or strive to survive by expanding into the OEM and REM markets.

SME promotion policy should primarily cover these independent parts suppliers as well as SMEs forming local industries.

9.3 SME Support Scheme

9.3.1 Japan and Italy

The counterpart of the Study is the organization responsible for formulation of national SME promotion policy and implementation of support programs and measures. In developing the action program for revitalization of small- and medium-sized manufacturers and improvement of their competitiveness to be implemented by the counterpart, the study team presents a basic concept on the government's role in the area in Chapter 4, which is summarized as follows.

"While government policy to advocate public support for SMEs is traditionally believed to form an important part of industrial policy, the argument about government's desirable role in industrial promotion, including SMEs, is now dominated by a negative tone, i.e., the mainstream of opinions opposes to at least excess government intervention, to reflect many cases of failure derived from past government intervention and the global trend toward the free market system. At the same time, however, there are a number of cases where government's active involvement has led to industrial development and economic prosperity. Although it is very difficult to draw a general conclusion from this argument, it is also true that there are necessary conditions for success of government intervention, namely the execution power of governments to ensure effective policymaking and fair implementation, and social consensus to support government policy and intervention."

Today, many countries emphasize the interindustrial (neutral) policy, rather than the selective policy that promotes a specific sector. This reflects the fact that the selective policy is no longer acceptable internationally because it inherently impedes free and fair competition. Furthermore, it has become apparent that it is very difficult for most countries to satisfy the above conditions for successful implementation of the selective policy. The action program proposed by the study team is therefore founded upon the conceptual framework of the interindustrial (neutral) policy.

Compared to the selective policy, the interindustrial policy has a wider target range and generally aims to create environmental conditions for local industries to enter the international market and improve competitiveness. It covers general themes, such as SME promotion, export promotion, science and technology promotion, and human resource development. In

these areas, government can still play a significant role.

In Chapter 7, SME policies and schemes in Japan, Italy and Spain were reviewed and analyzed. In particular, Japan and Italy share the history of nurturing SMEs as part of industrial policy under the leadership of the central government during the post-war reconstruction period. Today, however, there are large differences in SME promotion policies of the three countries.

Japan, since its economic reconstruction period, has been fostering SMEs under the strong leadership of the central government with a view to promoting the rebuilding of the national economy by using the manufacturing industry as the driving force, especially the machinery sector. Its industrial policy was of selective type to use large assembly manufacturers in the automotive and electrical/electronics industries as a main engine for overall industrial development. To foster SMEs making machine parts, intensive efforts were made to help organize close-knit assembler-supplier relationships (subcontract system). For large enterprises that did not have sufficient financial base and served a small domestic market in the post-war period, the subcontract system was a useful tool to save the capital cost and take advantage of wage difference. For SMEs that faced the lack of funds, technology and human resources for product development and market exploration, business deals with large enterprises brought benefits. As a result, the subcontract system developed and grew as mutually beneficial relationships.

As a result, the industrial structure consisting of large assembly manufacturers and captive suppliers (subcontractors), including local industries, was established and served as a major impetus for strong growth that was unprecedented in other countries. This highly centralized industrial system enabled highly efficient mass production by creating economies of scale. The centralized approach was also taken for SME support. The central government initiated a variety of support schemes that were gradually transferred to the hands of local governments and the private sector. A typical example is the SME consultant certification system that is based on the national examination.

There is a new trend relating to the manufacturing industry worldwide, as discussed in Chapter 7. However, adaptation of SME support policy in Japan to the new trend was somewhat late as the major amendment of the Basic SME Promotion Law occurred only in 1999. Decentralization of power has been demanded and discussed since 1980 and the need for delegation of power to local governments is voiced, actual progress has been relatively slow. Also, intensive discussions are raised and made to reduce government's role and involvement, i.e., the role of the central government should be limited to the interindustrial policy, but any

substantial change in strategic direction has still to be seen.

On the other hand, Italy changed its policy direction in 1975 by taking drastic measures to effectuate decentralization and delegation of power to local governments. Notably, the central government dissolved SME Corporation that spearheaded SME support. Regional industrial concentration, the networking of companies in the same industry, and the support system operated jointly by local governments and universities have enabled SMEs to gain competitiveness and establish presence in the international market. Industrial policy is established on a regional basis by local governments according to characteristics of local industries and is implemented jointly by the public and private sectors. On the other hand, the role of the central government is limited to the interindustrial policy making and implementation.

The majority of SMEs in Argentina are family operated as seen in Italy, and their operation is closely related to local community. Local governments play a principal role in industrial policy implementation. Support activities by Subsecretaría de Industria and SSPyMEyDR are limited to the holding of various events, such as Foro and export promotion, as well as loan-related service including project evaluation relating to applications made by local government or private company, and subsidy to cover part of the cost.

Judging from the establishment of local "agencias" since 2001 and the current status of SME support programs led by province and/or municipality, the SME support schemes in Argentina are closer to those in Italy that is characterized by the decentralized industry policy.

9.3.2 Decentralization of Power

Decentralization is clearly a worldwide trend, with its level and degree varying between countries. It is considered to be an important factor for driving progress of political democratization, in addition to promotion of economic growth.

Due to the experiences of a number of failures derived from the big government and the centralized political system, it is recognized that participation of people in the political decision making process is critical for sustainable development and growth. Local community is considered to be an appropriate place for expanding opportunities for political participation because economic and other activities are closely linked to people's daily life at the community level. In this sense, decentralization deals with a question of governance and is inseparable from the issue of political participation from the viewpoint of population. As participation

leads to empowerment of population, decentralization is a power source of local development and growth.

Generally, decentralization means delegation and transfer of the central government's power and functions to local governments. Although transfer of basic services, such as elementary education, raises a major political issue in some countries because it may affect the foundation of the country, the majority of opinions today is based on the notion that it is more efficient and effective than uniform delivery of service by the central government, for local governments can decide on service content and quality by taking into account local conditions. In other words, decentralization allows the provision of public service in such manner to reflect local conditions, and at the same time, efficient delivery of public service can lead to financial saving in terms of government budget.

On the other hand, there are advocates for the big government, who claim that, if financial and other resources are limited, centralized policy implementation will be more effective than the decentralized one. However, there are concerns about a danger of affecting the progress of democratization, so that the big government is no longer a mainstream idea.

Needless to say, the level of progress of decentralization and delegation of power to local governments varies greatly among countries. In Spain, decentralization comes before everything as a lesson learned from damage inflicted by the centralized political system. In Italy, local government forms an integral part of the country's tradition and history. In Japan, decentralization is the subject of heated discussion from the viewpoint of ensuring quick and efficient response to global changes in the industrial structure.

9.3.3 Central and Local Governments

Under the free market system, most SMEs are exposed to competition with imported products. In light of the fact that revitalization of SMEs has significant impacts on the national economy, adequate support by government is justified in the sense that it assists SMEs that would otherwise be unable to win international competition single-handedly due to the lack of information, funds, and human resources.

As discussed in Chapter 4, government should take a lead in the following areas as part of its interindustrial (neutral) policy.

1) Improvement of society's ability to introduce and absorb technology
2) Reduction of service link costs

3) Development of an environment to promote the building of diverse relationships between individual enterprises
4) Formation of industrial concentration
5) Promotion of transaction between enterprises in the same region

Among the above rules, governments often take up the reduction of service link costs, such as simplification of administrative procedures, deregulation, and the securing of fair competition. For small- and medium-sized manufacturers, however, equally important is the "improvement of society's ability to introduce and absorb technology." In other words, they need "the upgrading of basic technological capability."

The fundamental role of the central government should focus on the development of an interindustrial (no sector specific) policy framework and the implementation of nationwide support schemes that are planned within the framework. Support schemes required to improve technology levels of each sector will be implemented by local government that has jurisdiction over the areas where the industrial sector is concentrated. The central government should assume the role to back up such local efforts by providing basic education and training, which is conducive to the upgrading of basic technological capability. Note that "improvement of society's ability to introduce and absorb technology" as well as "reduction of service link costs" can be achieved only under the presence of the central government's sustainable policy and support system. Clearly, they cannot be left to the mercy of the market principle. As discussed in 9.2, a principal target group is small- and medium-sized manufacturers.

Another major challenge facing small- and medium-sized manufacturers is to develop the ability to explore markets and business opportunities. Many SMEs do not have resources to maintain an internal marketing organization, resulting in a substantial difference in information as compared to large enterprises. In this connection, government should also be responsible for development of an environment to encourage business relationships between SMEs and for provision of information on domestic and export markets.

Among the three types of small- and medium-sized manufacturers classified in 9.2, independent parts suppliers having no fixed supply contract and SMEs forming local industries need government support in the above two areas, namely the development of an environment to encourage business relationships between SMEs and for the provision of market information. Because these two types of SMEs are closely associated with their local areas, especially industrial concentration, in comparison to subcontractor-type parts suppliers, public support should be provided by respective local governments as part of support program for local

industries, rather than the central government. Furthermore, the private sector familiar with local conditions should be involved to conduct it as a joint program.

The proposed division of functional roles of the central and local governments is summarized below.

	Central government	Local government
1) Improvement of society's ability to introduce and absorb technology	○	
2) Reduction of service link costs	○	
3) Development of an environment to promote the building of diverse relationships between individual enterprises		○
4) Formation of industrial concentration		○
5) Promotion of transaction between enterprises in the same region		○

Caution is required for the Italian case. The country enjoys high levels of industrial concentrations and local governments play a leading role in SME support. However, most of industrial concentrations are formed by manufacturers of consumer goods. Thus, the automotive parts and other assembly industries of the pyramidal structure (led by large assembly manufacturers) have a substantially different structure from that of Italy's industrial concentrations and are founded upon a multi-tier supplier base (subcontract system).

As discussed in 9.3.1, the SME support scheme in Argentina is close to the Italian one that is founded upon decentralization of power. In many countries, however, it is often the case that the central government opts to assign SME support activities entirely to local governments or the private sector for the reason of insufficient fund or manpower. However, the central government should not release itself from certain functions that must be left to its responsibility, such as the development of a nationwide support system. Now the manufacturing industry in Argentina is entering a recovery period after the long recession. Supposing that SME promotion should be led under initiatives of the private sector, central and local governments should discuss on their respective roles in developing the environment to support the private sector's activities and reach a certain level of agreement as a priority issue in the policymaking process of the future.

The next chapter proposes action programs that should be promptly implemented by the

counterpart organization composed of the division in charge of SME support policy making and the one responsible for implementation of the SME support scheme.

Chapter 10

Proposal of Action Programs

Chapter 10 Proposal of Action Programs

In formulating model projects that are a core activity under the Study, the following rationales were presented in Chapter 4 as key elements of action programs that form the basis of designing the model projects.

A. The establishment of a formal system to promote dissemination of soft technology to local SMEs, including education and training on basic knowledge and skills, is one of the important roles that should be played by government. In fact, it is as important as school education and should form an integral part of national industrial policy. Its importance remains unchanged under the globalizing environment. For this reason, the establishment of a system to disseminate soft technology is proposed as a key element of the action program.

B. The operating status of 50 "agencias" varies greatly and some are reportedly inactive. As their intent and objective appears to serve the needs of the times, however, their activities should be enhanced. For this reason, the reinforcement of "agencies" is proposed as a key element of the action program.

This Study is designed to focus on soft technology, namely business and production management techniques that constitute an integral set of technologies and techniques required for revitalization of the manufacturing sector in Argentina. As discussed in Chapter 4, soft technology is essential for manufacturing industries, as important as hard technology and production skills. And the results of the corporate diagnosis and follow-up field guidance conducted by Japanese experts and INTI staff as model projects under the Study - as discussed in Chapter 6 – indicate that small- and medium-sized manufacturers in Argentina can improve their productivity significantly by introducing proper production management techniques, instead of making new investment. Clearly, the country has strong potential demand for soft technology, together with the need for establishing a support system to help its dissemination.

Note that production management techniques covered in the model project constitute basic technology for any manufacturing sectors, excepting those owned and transferred by automakers or other large manufacturers to SMEs that serve as their suppliers. In other words, a large number of small- and medium-sized manufacturers in the country did not consider introduction of such basic technology to their factory operation, nor they did not afford to or did not have an opportunity to introduce it.

While the model project has been implemented for small- and medium-sized, machine parts manufacturers, as explained in Chapter 9, there is strong demand for soft technology by independent parts suppliers and local manufacturers of finished products, which account for major portions of SMEs in Argentina.

Technological capabilities of manufacturers cannot be improved by leaps and bounds, but rather step by step. Furthermore, it is not feasible to introduce leading-edge technology without possessing basic technology or knowledge. Thus, dissemination of basic technology is conducive to the improvement of society's ability to absorb technology. The study team believes that basic production management technology should be taught and promoted under the government's leadership, as done for school education and skills training.

Under the above framework, the following action programs are proposed to promote and disseminate soft technology to small- and medium-sized manufacturers in Argentina.

Action Program A - Reinforcement of INTI as soft technology support center

- Action Program A1: Establishment of a soft technology support section within INTI
- Action Program A2: Training of INTI's soft technology support staff and expansion of staffing
- Action Program A3: Establishment of an expertise/experience certification system for "Extensionista PyME"
- Action Program A4: Implementation of INTI's soft technology training courses
- Action Program A5: Formulation of a plan to develop soft technology dissemination system

Action Program B - Dissemination of soft technology by "agencia"

- Action Program B1: Training of "agencia" staff as "Extensionista PyME"
- Action Program B2: SSPyMEyDR's subsidy system for certified "Extensionista PyME" of "agencia"

Action Program C - Operation and promotion of use of a SME support tool (Bolsa de PyME)

10.1 Action Program A - Reinforcement of INTI as Soft Technology Support Center

10.1.1 Rationale for Proposal

Importance of soft technology is strongly recognized in many countries that aim to develop manufacturing industries, where there are organizations playing a key role of dissemination and promotion of soft technology.

As discussed in Chapter 7, non-financial support services in Japan are characterized by, among other things, the presence of training institutes of SME management consultant that are led by the central government. The training institutes provide training for persons who are engaged in SME consultation service at public or private organizations throughout the country by communicating with local SMEs on a daily basis and providing advice. Thus, the training institutes of SME management consultant play a vital role in dissemination of soft technology by providing training for SME consultation staff that needs to develop expertise for effective support service.

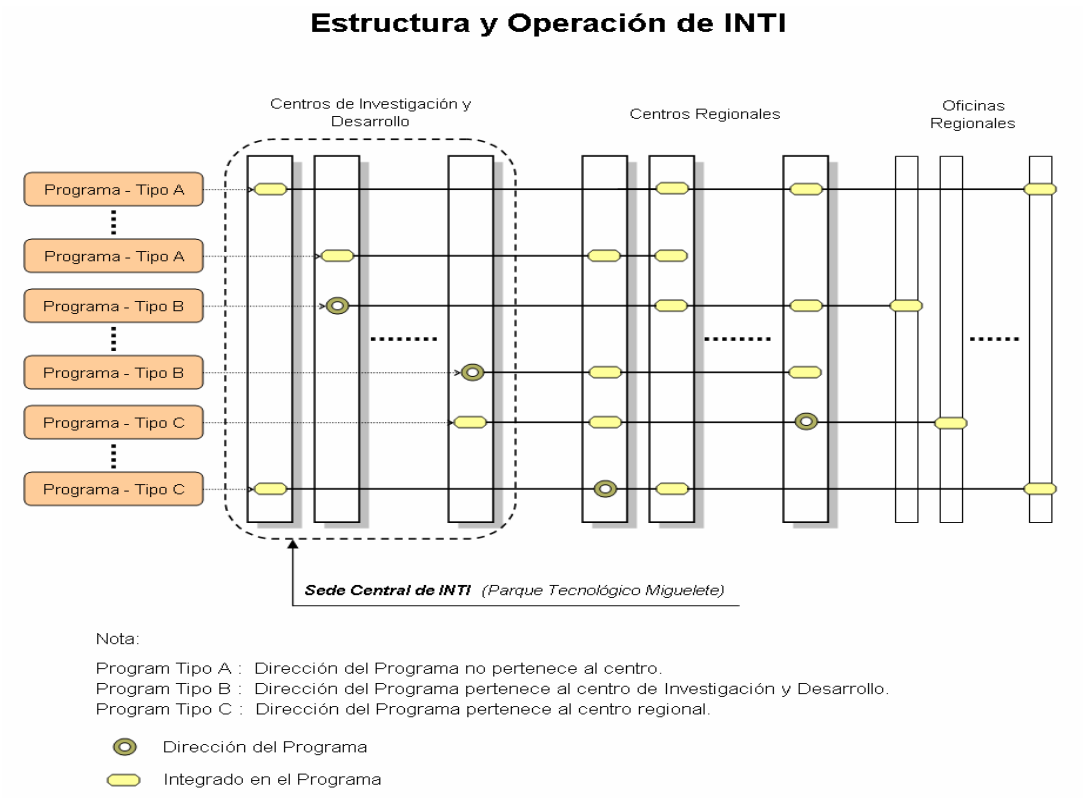
While development, promotion and dissemination of hard technology is generally left to universities and training institutes - public or private, soft technology needs to be taught on the shop floor as it is developed through accumulation of expertise and know-how at production fields, and SMEs expect to learn it in the form of field guidance. However, an opportunity to learn soft technology is generally limited for SMEs, excepting technical assistance provided by assembly manufacturers for their subcontractors (suppliers). In Japan, there is a debate about whether the role of government should be reduced in the area of technical support for SMEs, but the discontinuance of the training institutes is not proposed or considered.

The study team examined the current state of the soft technology support system and the extent of dissemination in Argentina and Brazil, which competes with Argentina in many manufacturing sectors. As discussed in Chapter 8, Brazil actively deploys nationwide efforts to disseminate soft technology under the leadership of IBQP and there are many organizations to provide field-based guidance for manufacturers. In contrast, such support activities in Argentina have once emerged but are now virtually dormant, e.g., there is no organization that is engaged in systematic dissemination of soft technology, and some centers of INTI, universities, consultants and trade association provide non-periodical guidance in the form of seminar or project-based consulting service.

INTI has been spearheading technology promotion in the country since 1957 and is a widely

known technical support organization. Its headquarters in Buenos Aires has technology centers specialized in various areas, which play a leadership role in each field of technology. INIT has also regional centers, which are responsible for industrial promotion in each region. Note that the regional centers have their own historical backgrounds, not organized under the headquarters' policy. Rosario, Rafaela and Córdoba centers, which are counterpart organizations of the model project, are part of the network of INTI's regional centers. At present, INTI has a total of 29 centers, including technology and regional centers.

Fig.10.1 illustrates INTI's organization and its operation.



Source: JICA Study Team

Fig. 10.1 INTI's Organization and Operation

INTI's organization was originally led by departments and bureaus, while centers had their own policy and financial source under the so-called "center system." At present, however, it is operated around "programas" that links the headquarters and individual centers. There are seven "programas", each of which is composed of an execution organization and participating centers. The "programas" are classified into three types according to the belonging of the execution organization: type A that the execution organization does not belong to a specific center; type B that the execution center belongs to the headquarters' technology center; and type

C the execution center is under a regional center. Some of type A "programas", such as quality control, are participated by all technology and regional centers. Each center conducts activities related to each "programa" in which it participates, under the execution organization.

Programa de Grandes Empresas
Programa de Desarrollo
Programa de Ensayos y Asistensia Técnica
Programa de Estado y Proyectos Especiales
Programa de Extensión
Programa de Fortalecimiento de Centros
Programa de Metrología, Calidad y Certificación

In the 1950s when Japan made national efforts to develop manufacturing industries, including dissemination of soft technology, a new organization was established within INTI under assistance of the Netherlands, for the purpose of providing SME support in the area of soft technology. CIME, as discussed in Chapter 8, was engaged in various activities up to 2003. It retains its original name but organizationally it is under "Programa de Extensión". At the same time, CIME's activities have been virtually transferred to Rosario Regional Center, which conducts SME support activities using soft technology and under assistance of Japanese experts.

"Programa de Extensión" is designed to upgrade technological capabilities by propagating knowledge common to a specific region or sector. Its main activities are training programs for individual enterprises and entrepreneurs, currently centered on those for microentrepreneurs. It is also expected to provide soft technology-related training and guidance for enterprises, as transferred from old CIME, but the activity is not widely carried out. Note that, within INTI, "Extensión" is often considered as a function to spur and identify demand for INTI, rather than field guidance for individual enterprises.

Thus, INTI has some experience in SME support using soft technology and posts it as one of its main activities, but there is no formal system or organization to support it with its overall resources.

What is needed in Argentina is a nationwide organization that plays a central role in providing support in the area of soft technology. INTI is expected to form and maintain such organization by leveraging its nationwide network and meeting diverse demand from manufacturing sectors as an organization spearheading dissemination of soft technology. Its activities should therefore include, in addition to seminars and field guidance service, collection

and dissemination of technology information in other countries as well as an award system for enterprises that have achieved significant kaizen effects using soft technology.

10.1.2 Action Program A1: Establishment of a Soft Technology Support Section within INTI

This action program proposes the establishment of a technical support system in the area of soft technology and the startup of continuous activity by establishing a section containing "soft technology" in its name. In fact, INTI has already moved to establish such section by taking an opportunity created by the model project. It is highly desirable to have a support center which name includes words "soft technology, even if promotion of soft technology is carried out as one of "Programa".

As details of the action program are to be left to INTI because they are concerned with its internal organization, the study team only presents the following plan as reference.

Alternative 1: To establish "Soft Technology Center" as one of technology centers at headquarters
Alternative 2: To convert Centro de Extensión y Desarrollo to "Soft Technology Center"
Alternative 3: To convert Roasrio Regional Center to "Soft Technology Center"

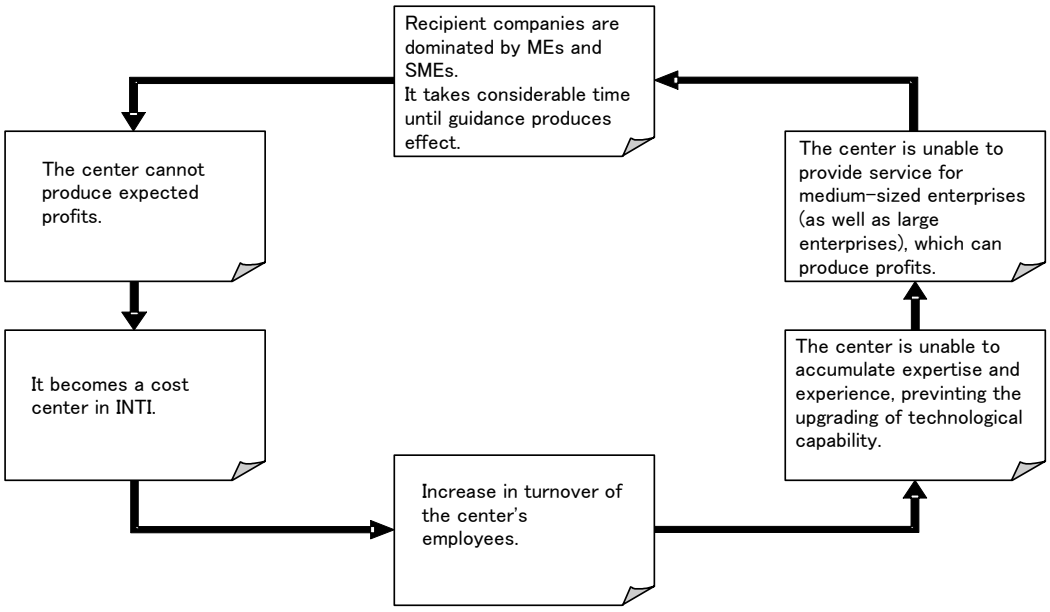
In the course of the present Study, various initiatives are taken as part of joint efforts by the study team and the counterpart, such as the sharing of experience and resources relating to field guidance between regional centers and mutual visits by individual enterprises. However, these activities are not necessarily conducted systematically because a core organization of soft technology support is not clearly defined within INTI.

INTI has not yet accumulated sufficient soft technology. To maximize effectiveness on the basis of insufficient expertise and resources, INTI has to centralize and share them within its organization. In particular, the organizational sharing of expertise and experience is very important when a new organizational activity is started. This proposal is intended to accumulate know-how of the old CIME, experience of Rosario Regional Center, and knowledge and experience transferred from the study team as part of the Study at a new "Soft Technology Center," thereby to allow the center to conduct integrated activities through a formal "Programa".

Like other centers, Soft Technology Center is expected to self-finance part of its operating cost

by revenue from a profit-making activity. Yet, INTI as a public organization primarily serves local industries, which are mostly microenterprises and SMEs. To add a further complexity, soft technology support often requires considerable time until recipient companies can feel its effect, not to mention the fact that microenterprises and SMEs tend to be behind payment for service fee, whereas they strongly demand such public support. As a result, it is highly likely that Soft Technology Center has to become a cost center for INTI, for a certain period after its startup. It is therefore imperative to taken effective measures to prevent the center from lowering staff salary, which would lead to deterioration of morale and an increase in turnover. Especially, frequent resignation of staff will prevent accumulation of expertise and thus the improvement of the center's support capability.

Fig. 10.2 presents major issues commonly seen among soft technology support divisions of public technical support organizations in the form of a "vicious cycle". Fortunately, INTI has established close relationships with many companies by performing over 20,000 services in a variety of areas including analysis, testing, technical assistance, and calibration. Therefore, what it needs is temporary support by other departments for a new soft technology center until its activity starts up, such as use of established relationships with individual companies to spur demand for soft technology support service.



Source: JICA Study Team

Fig. 10.2 "Vicious Cycle" Faced by Public Technical Support Organizations

10.1.3 Action Program A2: Training of INTI's Soft Technology Support Staff and Expansion of Staffing

Four organizations have participated in the model project as counterpart for study team members, namely Centro de Extensión y Desarrollo, Rosario Regional Center, Rafaela Regional Center, and Córdoba Regional Center. More precisely, about 15 persons – some of them participated in the middle of the project – provided guidance service for model enterprises, jointly with experts of the study team. Note that 2 out of 15 participants were members of AGE (Asesores en Gestión de Empresa) under the old CIME.

In fact, these 15 persons are INTI's entire resources specialized in soft technology support. They have contributed to the outcome of the model project and should be partly credited for it. And they will become a central force of "programa" implementation by the newly formed "Soft Technology Center."

It should be noted, however, that the counterpart staff, except for the formal AGE members, includes those with experience in providing guidance in the area of soft technology before the start of the Study, and those who have newly joined INTI for the purpose of the Study. For the latter, one year experience in the model project is far from sufficient to address and solve a variety of problems brought by SMEs. It is therefore important to link the valuable experience effectively to the development of expertise in soft technology support. In fact, the future of "Soft Technology Center" depends upon this first generation of support staff.

To make up for the shortage of experience of some counterpart staff and help them to acquire expertise required for the center to provide support service on its own, it is imperative to conduct internal education and training on a continuous basis by inviting outside experts with rich experience in field guidance service (including Japanese ones) and in cooperation of AGE members under the old CIME. In light of the fact that it needs some time for young counterpart staff, who has joined INTI on the occasion of the Study, to become capable of providing consultation service for SMEs by themselves, outside experts need to be hired for at least one year, desirably two years.

In the future, INTI's SME support in the area of soft technology will be led by Centro de Extensión y Desarrollo, Rosario Regional Center, Rafaela Regional Center, and Córdoba Regional Center, which have participated in the model project under the Study. While details of their operations have not been finalized, such as the number of outside experts to be hired and their assignment, it is important that outside experts should be shared by the four centers, rather

than leaving the utilization of experts to each center. This way, INTI will be able to make most use of outside resources in an effective and efficient manner. Assuming that "Software Technology Center" proposed in Action Program A1 rolls out, a training plan will be made by using the center as the execution organization for "programa", which will share outside experts. The plan should include, among other things: 1) implementation of internal training for counterpart staff at a single center; and 2) the establishment of a periodical rotation plan for outside experts between different centers without fixing their assignment.

Based on the experience in the model project, the following approaches should be taken during the initial training period.

a. Guidance service for recipient companies in the model project should be continued. As many of them start to realize the effect of soft technology implemented under the model project, continued guidance should help them to maintain and maximize the effect and spur demand from other companies.

b. The model project targeted the mechanical parts sector, but soft technology is essential for all manufacturing sectors. Also, in consideration of the fact that INTI's mission includes public support for local industries to upgrade technological capability, local industries should be selected as a future target for soft technology support service in order to expand the scope of service.

c. In selecting new companies for soft technology support, brochures will be published for each of kaizen themes, as INTI has expertise and experience in various themes relating to soft technology.

   Table 10.1 lists KAIZEN themes that can be promoted by INTI to its potential customers, or recipient companies, with a sample promotional phrase to advertise each theme on the brochure.

Table 10.1 KAIZEN Themes and Promotional Phrase by INTI

Kaizen theme	Sample promotional phrase
5S	5S forms the basis of all production activities and is the prerequisite to any kaizen activity. We will provide detailed guidance from the 5S concept to its practice on the shop floor, with an emphasis on 3S that forms the fundamental part of 5S.
Small group activity	Small group activity is a place to mobilize mutual learning and concerted collaboration to accomplish the company's vision and objective, not to mention quality improvement. We will provide a full

	range of support, ranging from internal presentation to employees and evaluation of an actual small group activity.
Reduction of setup time	Reduction of setup time leads to reduction of work-in-process, streamlined, small-lot production flow, and the improvements of customer satisfaction and productivity. We will think and conceive with you a method to reduce setup time significantly.
Cell production system	A cell production system is a dedicated or limited, small-scale line processing multiple parts and is capable of minimizing setup change requirements. It is essential in small-lot production of multiple product types. It is a power tool to prevent concentration of workload on NC and other machines, and it also helps cost reduction by effectively using an old machine by modifying it to a single-function machine with minimal investment.
Plant layout	We will propose an optimum factory layout on the basis of detailed analysis of your production line. Our service is most effective in factory relocation and expansion planning.
Preventive maintenance	Preventive maintenance allows you to prevent damage to machinery and equipment and promote the streamlining of production activity by performing periodical inspection and scheduled repair and modification. We will help you to build a reliable maintenance system.
KANBAN system	The KANBAN system is a production system to control product flow in terms of total quantity and is characterized by use of "kanban" –a signboard carrying instruction – that is repetitively used to issue an instruction for production from the subsequent process to the preceding one. As the instruction is issued to the preceding process to supply the quantity of products purchased by the customer or sales agent that is positioned in the final part of the subsequent process, no waste production occurs. When the KANBAN system is applied to a production line for small-lot and/or irregularly shipped products, such as repair parts, effective inventory reduction can be achieved as inventory does not exceed the number of kanbans. We will assist you in the entire process of implementing the KANBAN system, from employee training to field guidance.

Source: JICA Study Team

Naturally, new themes will be added according to the improvement of INTI staff's skills and experience. However, introduction of a theme for which an effective approach or solution has not been found should be avoided.

d. During the model project period, a meeting was held by INTI at each center to give an opportunity for participating companies to exchange experience and was received very well by participants. In fact, this activity was already conducted 20 years ago in Rosario, as PATI (see Chapter 8). The meeting to promote exchange between companies creates various benefits for INTI as well and should be made into one of core activities of INTI – in addition to field guidance - that needs to be conducted on a continuous basis.

e. During the same period, a field tour was organized to visit companies having advanced soft technology that operated near each center. INTI should keep contact with these companies and lead a periodical field tour by organizing companies that receive field guidance service.

f. Periodical meetings to promote exchange of experience between regional centers should be conducted on a periodical basis. Allowing the centers to share causes of success and failure will help improve INTI's ability to provide effective guidance.

g. As part of experience sharing efforts, manuals and videos prepared by experts during the model project will be upgrade and enhanced jointly by regional centers. Note that INTI keeps manuals prepared by the old CIME and production of videos based on actual cases of companies that received field guidance is expected to have an excellent educational effect.

As for enhancement of the soft technology support organization, the study team proposed, during the study period, promotion of INTI staff to the organization, and it is already being done to some centers. The intent of the proposal is summarized as follows.

"The study team's experts in soft technology have all started their career as hard technology engineers in various fields, such as machining and casting. For soft technology experts, expertise and experience in hard technology is not necessarily a prerequisite but constitutes a significant strength. INTI has already a large pool of experts in various fields of hard technology, who have experience in providing field service for SMEs. Use of these experts is therefore a desirable approach to the strengthening of the soft technology support section."

In providing field guidance for small- and medium-sized manufacturers, a combination of the expert of soft technology and the expert of hard technology that is used in an actual production line becomes very effective in many cases. As hard technology covers a wide range of fields, the next challenge is to establish a flexible support system within INTI that allows formation of a team of soft and hard technology experts from various departments, which meet the diverse needs of recipient companies.

10.1.4 Action Program A3: Establishment of an Expertise/Experience Certification System for "Extensionista PyME"

Soft technology required by companies covers a wide area including business administration, marketing and sales, HR management and development, finance, and production management.

In Argentina, there is a large number of promotion and training programs in the fields of market development and export promotion, and also, seminars on HR management/development and finance are conducted by universities and individual consultants. On the other hand, there is an apparent lack of schemes to promote dissemination of production management technology relating to the improvement of production fields or factory management, and to provide field guidance for individual companies. This was recognized by many persons who participated in meetings between the study team and local governments or trade associations.

In 4.3, it was pointed out that a main reason for low levels of dissemination and implementation of soft technology in Argentina, compared to other countries, was a general lack of recognition on its existence and necessity. In particular, the study team identified the lack of awareness of production control technology, and for this reason, the model project under the Study primarily focused on production control technology, and which will be the main target of INTI's "Soft Technology Center" as proposed here. Furthermore, as production control technology is closely associated with production fields, many companies wish to learn it through field guidance on the shop floor, rather than a classroom-based seminar.

In Argentina, consultants, both individuals and firms, provide a variety of services for SMEs, and DIRCON maintains a registration system for consultants in the area of soft technology. However, there is no certification system to assure the consultant's ability or experience, which is prerequisite to the consultation contract.

INTI intends to provide soft technology support by working together with a company to solve a problem for the purpose of improving productivity at its factory. Therefore, INTI staff who provides the service is required to have the ability to understand the customer's needs and give appropriate guidance or advice, including reference to outside experts as required. This is equivalent to skills and experience required for SME extension service staff.

This action program proposes the establishment of a certification system for SME extension service personnel ("Extensionista PyME"), which may be positioned as a junior consultant. Originally, the certification system will be operated as INTI's internal certification system and will be used to raise motivation of staff who is engaged in soft technology support. Then, obtaining the certification should be reflected in salary and other working conditions. Needless to say, the certification system is to assure INTI's customers of its service quality in terms of expertise and experience.

The fact that a widely recognized public technical support organization INTI assures its

extension service staff's ability and experience has a significant effect in spurring demand for soft technology support by creating a general confidence in service quality. It also helps improve an environment to support private consultants. As discussed in Chapter 7, Japan has a national certification system for SME management consultants.

The study team assumes the level of expertise and experience of "Extensionista PyME" can be reached by INTI counterpart staffs, if they receive training from outside experts for one year after the end of the Study and perform field guidance service jointly. Preliminary qualifications for "Extensionista PyME" are summarized as follows.

Knowledge and skills required for "Extensionista PyME"

Production control technology consists of a number of tools, including those developed by individual companies, which can be classified to basic and applied techniques, as listed below. Of these diverse techniques, "Extensionista PyME" is expected to have received theoretical training on basic production control techniques, together with skills to apply them to the shop floor as well as certain experience in corporate diagnosis and guidance.

Basic production control
- 5S
- Measures against Muda, Muri, Mura
- Material handling
- ABC analysis
- Preventive maintenance
- Quality control and QC tools
- ISO 9000 series
- Small group activity
- Production planning
- Low cost automation
- Inventory management
- Plant layout
- Production cost
- KAIZEN

Applied production control
- Industrial engineering
- Quality assurance
- JIT-Kanban System

Total Preventive Maintenance (TPM)
Material Requirement Planning (MRP)
Value Analysis/Engineering (VA/VE)
Flexible Automation (FA)
Application of IT
Environment
Cost management

1) Training hours

Training hours required for certification of "Extensionista PyME" are summarized below. They include instructor's lecture, case study, and field tour.

Training item	Training hours
5S	6
Measures against Muda, Muri, Mura	3
Material handling	6
ABC analysis	6
Preventive maintenance	6
Quality control and QC tools	12
ISO 9000 series	3
Small group activity	3
Production planning	9
Low cost automation	3
Inventory management	9
Plant layout	12
Production cost	6
KAIZEN	6
Total	90 hours

2) Experience in field guidance

To be certified as "Extensionista PyME", at least two cases of field guidance service (each case consisting of factory diagnosis of a company followed by continuous field guidance for one year) are required as practical experience.

INTI counterpart staffs who participate in the Study have already learned basic production

control techniques in the course of the model project. By conducting joint field guidance projects with outside experts for one more year, they will be able to acquire additional techniques and theories and apply them on the shop floor. Then, they will have further experience in providing guidance for two or more SMEs in the mechanical parts sector and/or a local industry sector for the duration of one or two years. Problems faced by SMEs are common to a certain extent. As they have at least two-year experience in the future, they will be able to develop the ability to deal with a variety of problems facing SMEs and make sound judgment.

Now, INTI should start a certification system for "Extensionista PyME" and certify the counterpart staffs by providing them with the training proposed in 10.1.3. Thereafter, the first-generation "Extensionista PyME", together with AGE members of the old CIME, will serve as instructors for ensuing candidates to train them to become the next-generation "Extensionista PyME".

The ultimate goal is to develop the certification system for "Extensionista PyME", who is the country's first professional (junior) consultant in the area of soft technology, to a national certification system. To do so, advertisement and promotion to government organizations and the private sector and collaboration with other technical support schemes are required. In particular, close communication and coordination with SSEPyMEyDR – government agency responsible for SME support – is very important.

10.1.5 Action Program A4: Implementation of INTI's Soft Technology Training Courses

This action program proposes a future goal for INTI after "Soft Technology Center" has been established and its staff has started to serve as "Extensionista PyME", when INTI is expected to have its own training program. The proposal is to expand the training program to make it available to participants from outside and to make INTI fulfill the role as a public organization to lead dissemination of soft technology.

The action program has the following objectives:
- To certify staff of SME support organizations other than INTI as "Extensionista PyME"
- To disseminate soft technology to company owners, factory managers, and employees

(1) Certification of staff of SME support organizations other than INTI as "Extensionista PyME"

In 10.1.4, it was proposed to develop the certification system of INTI for "Extensionista PyME" to a national system. To do so, INTI must be recognized as a leading organization responsible for promotion and dissemination of soft technology in Argentina and activities of "Extensionista PyME" as INTI service must be widely accepted. Then, it will become a good impetus for wide acceptance if companies, who wish to receive soft technology support service from technical support organizations other than INTI, demand that personnel who provides the service is certified by INTI as "Extensionista PyME".

As discussed in 10.1.4, INTI's training program, which will accept outside participants, will consist of a training course totaling 90 hours and practical experience in field guidance for at least two companies. If the training course is offered as a nighttime course that lasts three hours per session, participants are required to attend for six weeks per year, so that it is feasible for outside participants to obtain certification while keeping their own jobs.

(2) To disseminate soft technology to company owners, factory managers, and employees

This means activities, such as seminars, to disseminate soft technology to company owners, factory managers, and employees, regardless of certification.

Seminars will cover a wide range of subjects including both basic and applied production management techniques. Table 10.2 lists major topics expected to be covered by seminars and their intent, although topics should be selected through close communication with companies and questionnaire surveys to identify the needs. Each seminar will take one to a few days and will be held periodically. It is desirable to design a flexible system to allow participants to select a seminar freely, while including field tours to visit manufacturers having advanced levels of soft technology and participating companies.

Seminar speakers should include INTI instructors and outside experts, including university faculty members and company managers in order to present theoretical and practical points of view.

Table 10.2 Subjects of Soft Technology Training Program

No.	Item	Intended for	Intent	Key points
PC-1	5S	Worker Supervisor/Manager President	Factory management starts with good housekeeping, which is represented by 5S. The course teaches 5S's significance and key points, together with case studies.	5S stands for "seiri" (orderly arrangement), "seiton" (tidying up), "seiso" (clearning), "seiketsu" (cleanliness), and "shitsuke" (discipline).
PC-2	Measures Against Muda、Muri、Mura	Worker Supervisor/Manager	To learn the technique to identify the needs for improvement of production technology through field observation.	To help participants to understand the meaning of "muda" (waste), "muri" (lack of sense"), and "mura" (variation) and link it to job improvement.
PC-3	Material Handling	Supervisor/Manager President	To promote understanding of importance of transportation as production management technology within the factory.	1. Activity indicator 2. Analysis of the transportation process 3. Method for selecting transportation equipment 4. Positioning in cost, etc
PC-4	ABC Analysis	Supervisor/Manager President	To learn the techniques used in the materials inventory management system and to improve efficiency through focused management.	To classify all inventory items to three classes (A, B and C) according to value, quantity and other parameters, and to manage each class in an appropriate method.
PC-5	Preventive Maintenance	Worker Supervisor/Manager	To learn a preventive maintenance method to ensure effective operation of existing equipment.	1. Production activity and equipment 2. Equipment lifecycle 3. Equipment maintenance 4. Basics of machine elements
PC-6	Quality Control and QC Tools	Supervisor/Manager President	To learn the basic concept of quality and a quality design approach, and use of seven quality control tools required by using examples.	1. Control chart 2. Histogram 3. Stratification 4. Pareto chart 5. Check sheet 6. Cause and effect diagram 7. Scatter diagram
PC-7	Basic knowledge on ISO9000 series	Supervisor/Manager President	To promote understanding of "quality management system" ISO9000 series that are required by customers to suppliers.	- What are ISO9000 series? - Advantages of ISO9001 certification - Examination registration system and organization - Method to promote activities to obtain certification - Explanation on ISO9001 standard - Explanation on quality management system requirements
PC-8	Small Group Activity	Worker Supervisor/Manager	To learn the method to energize the shop or factory by workers to propose and	To explain the technique to accept viable suggestions and put them into practice.

			discuss ideas for job improvement.	
PC-9	Production Planning	Supervisor/Manager President	To learn the planning technique for improvement of productivity that is the principal goal of production management.	1. Production system 2. Process control 3. Production control
PC-10	Low cost Automation	Worker Supervisor/Manager	To give an opportunity to learn simple improvements that can be conceived and implemented on the shop floor, such as simple innovation relating to machine operation (e.g., automatic stop and reset).	To stimulate kaizen and improvement relating to existing equipment.
PC-11	Inventory management (inventory control and delivery schedule management)	Supervisor/Manager President	To learn inventory management techniques required to maintain optimal inventory levels and monitor details of inventory accurately.	- Basics of inventory management - Inventory turnover - Key points in acceptance, storage and shipment - Purpose and method of inventory taking - Adequate inventory and order receiving/purchase requisition methods - Know-how on inventory reduction - Method to shorten the production period
PC-12	Plant Layout	Supervisor/Manager President	To learn the SLP (systematic layout planning) technique	SLP procedures 1. PQ analysis 2. Dependent relationships between activities 3. Preparation of diagrams 4. Examination on alternatives
PC-13	Production Cost	Supervisor/Manager President	To understand cost structure in the context of production and process	From understanding of cost elements to break-even point
PC-14	KAIZEN	Worker Supervisor/Manager President	To learn a general kaizen technique: to break down kaizen procedures into steps, to identify issues relating to each step, and to reach a conclusion and devise a solution.	1. Kaizen goal 2. Analytical procedures 3. Training for conception methods 4. Measurable results
PC-15	Industrial Engineering	Supervisor/Manager	To learn various industrial engineering techniques.	To understand the concept of industrial engineering, i.e., series of activities relating to system design and improvement by mobilizing HR, materials, and equipment in an optimum combination.
PC-16	Quality Assurance	Supervisor/Manager President	To understand the concept of quality assurance, i.e., to	To study quality assurance in the following three stages:

			assure that quality is at a specific level, and to learn about a system required to conduct quality check and appropriate action for the purpose of achieving the goal.	1. Design 2. Production 3. Use
PC-17	JIT･Kanban System	Supervisor/Manager President	To understand the basic concept of the JIT-kanban system, i.e., to use a "kanban" (signboard) to issue a production order automatically to a shop or process that produces a part or product which inventory falls below a specified number. The system is a production management tool useful for effective inventory control and/or identifying and solving a bottleneck (problem) relating to a production line. This course will help participants to understand that effective use of the system can produce significant benefits and profits.	To examine the method to make products within the shortest period after order receiving, while minimizing inventory of repair parts that are rarely used or small-lot products (target – zero). (This can be achieved by holding a sufficient variety of raw materials in stock, while minimizing final goods inventory.)
PC-18	Total Preventive Maintenance	Worker Supervisor/Manager President	To learn about a practical method for equipment maintenance under factory-wide efforts to ensure efficient operation	The equipment maintenance method in both hard and soft aspects
PC-19	Material Requirement Planning (MRP)	Supervisor/Manager	To understand the basic concept of the MRP system that allows accurate determination of raw materials requirements for production in a systematic manner.	1. Preparation of parts list 2. Estimation of raw materials requirements 3. Determination of procurement schedule 4. Major issues relating to implementation of the MRP system
PC-20	Value Analysis Engineering (VA/VE)	Supervisor/Manager	VA is an effective tool to reduce raw materials requirements and costs, and VE applies VA from the design and development stage for significant cost reduction. The course teaches practical VA/VE techniques.	1. Basic concept of VA 2. Problem solving system 3. VA/VE techniques and procedures
PC-21	Flexible Automation (FA)	Supervisor/Manager President	To understand essential technologies configuring the FA system, i.e., a set of technologies used for	1. Essential technology 2. Software 3. Monitoring technology 4. Robotic technology

			automation of factory production	5. Transportation system, etc.
PC-22	Application of IT	Supervisor/Manager President	Based on the assumption that IT is still in the developing process and is not a firmly established branch of engineering, future application of IT is examined with reference to case studies.	1. IT in the manufacturing industry 2. IT in the service industry 3. Use of IT for consumer applications, etc.
PC-23	Environment	Worker Supervisor/Manager President	To learn key issues relating to environmental protection, which facing today's companies, and understand them as an integral part of basic knowledge relating to factory management.	1. Noise 2. Water quality 3. Air 4. Wastes 5. Relevant laws and regulations, etc.
PC-24	Cost Management	Supervisor/Manager President	To learn the cost planning and control methods in the production stage for the purpose of cost reduction and improvement of profitability.	- Cost management - Cost accounting method - Standard cost management - CVP analysis and cost management - Cost improvement

. Source: JICA Study Team

10.1.6 Action Program A5: Formulation of a Plan to Develop Soft Technology Dissemination System

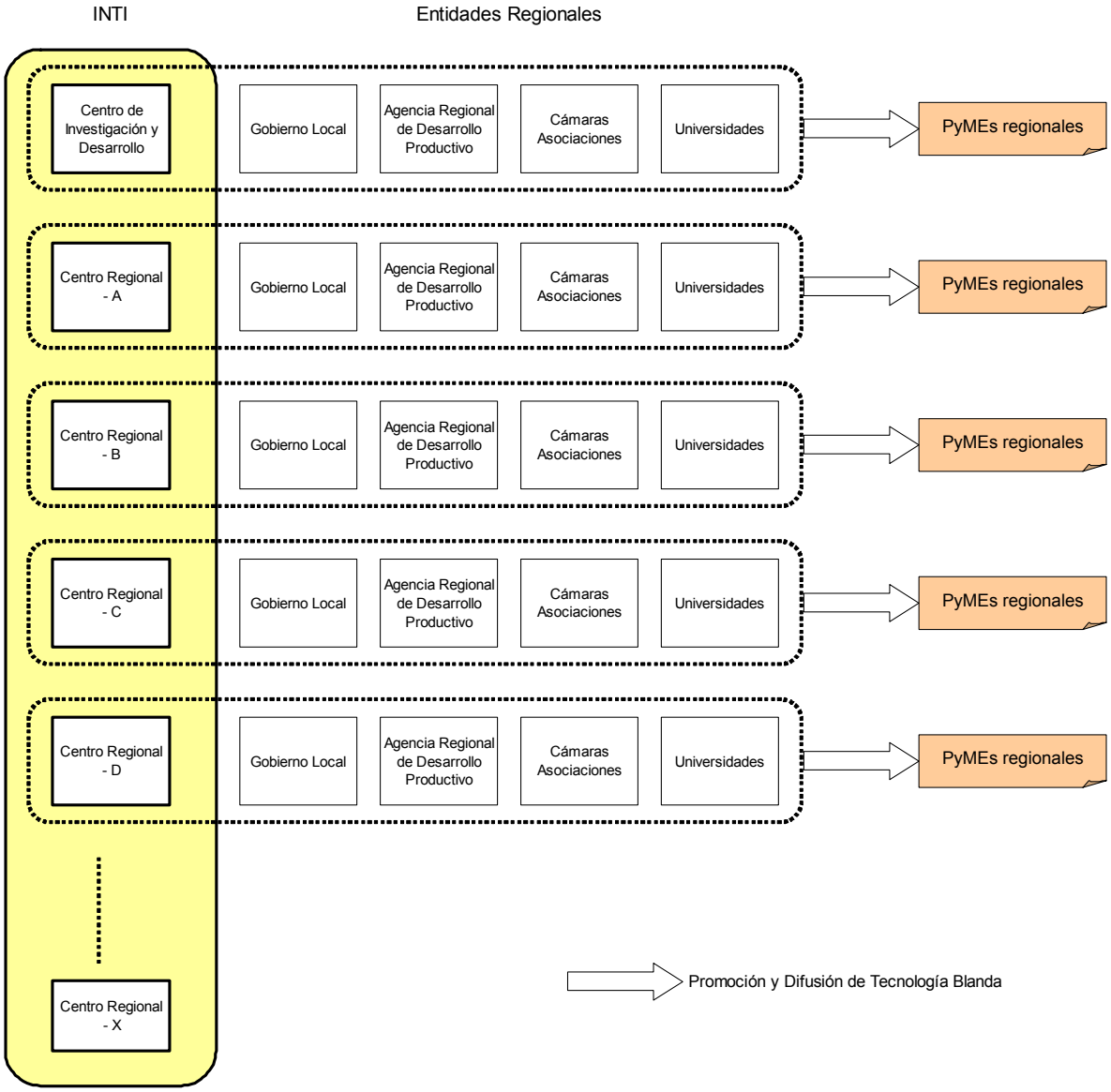
Action Programs A1 through A4 address the issues to be dealt with by INTI as the leading agency to promote further dissemination of soft technology in Argentina.

To ensure smooth dissemination of soft technology to small- and medium-sized manufacturers throughout the country, it is imperative to establish a nationwide promotion system under the strong leadership of INTI and the full-scale participation of SME support organizations, trade associations, and universities at national and local levels. In particular, it is proposed that the INTI work together with related government offices and organizations to formulate a plan to develop the soft technology dissemination system in the country, not to mention the reinforcement of its internal organization and resource to support day-to-day dissemination activities.

Potential partners for the INTI in such joint planning effort are local governments, trade associations such as Cámara, educational institutions including universities, and "Agencia" mentioned in Action Program B.

In Argentina, support for local industries has traditionally been provided under the leadership of local governments and other related regional organizations. The plan should therefore envision a soft technology dissemination system that is suitable for each region by taking into account the region's characteristics and the current state of local SME support.

Fig.10.3 presents a conceptual image of the future soft technology dissemination system in Argentina, where INTI plays a central role.



Source: JICA Study Team

Fig. 10.3 Conceptual Image of Future Soft Technology Dissemination System

10.1.7 Time Schedule for Action Program A

Fig. 10.4 presents preliminary time schedules for the above five action programs that are proposed to INTI.

In the first step, the soft technology support section should be established within INTI and a training program for counterpart staffs who have participated in the Study will be conducted to upgrade their skills. In fact, discussion has already started on the establishment of the section, and counterpart training is underway as part of the Study. In addition, INTI will strengthen staffing for the soft technology support organization by recruiting from its own personnel or outside.

The training period required for capacity building of the counterpart staffs is assumed to be one year after the end of the Study. At the same time, INTI should establish a certification system for "Extensionnista PyME" by the end of the training period.

Offering INTI's training program to employees of other SME support organizations and private companies is expected to start in the second year after the end of the Study.

Action Program – A		1st Year	2nd Year	3rd Year	4th Year	Onward
1	Establishment of a soft technology support section within INTI					
2	Training of INTI's soft technology support staff and expansion of staffing					
3	Establishment of an expertise/experience certification system for "Extensionista PyME"					
(3)	First certification of INTI's "Extensionista PyME"					
4	Implementation of INTI's soft technology training courses					
5	Formulation of a plan to develop soft technology dissemination system					

Source: JICA Study Team

Figure 10.4 Time Schedule of Action Program - A

10.2 Action Program B - Dissemination of Soft Technology by "Agencia"

10.2.1 Rationale for Proposal

SSPyMEyDR has been operating Red de Agencias Regionles de Desarrollo Productivo since 2000, which is modeled after a similar program in Spain. For SSPyMEyDR that does not have any regional office, "Agencias" serve as an important policy tool to achieve the dual purpose of SME promotion and regional development, although they are an independent non-profit organization that is jointly established by local government and the private sector. They provide support that takes into account local characteristics by promoting alliances between public and private support organizations in each area, with an aim to improve competitiveness of MEs and SMEs and to contribute to development of regional economy. At present, approximately 50 "Agencias" are in operation throughout the country and are steadily increasing. And they form a nationwide network under SSPyMEyDR, while maintaining their independence.

"Agencias" vary greatly in their level of activity as well as service content. SSPyMEyDR sets forth standards for their activities, which are either financial or non-financial in nature. Financial activities constitute a principal domain of Agencia's activity, including dissemination of information on and promotion of subsidy programs offered by SSPyMEyDR and local governments, and technical assistance relating to application therefor. In addition, "Agencias" are responsible for identifying recipients of the PDE (Proyectos de Desarrollo Empresarial) program that is conducted by using a consultant registered with DIRCON by SSPyMEyDR and under government subsidy, as discussed in Chapter 8.

As for non-financial activities, most important one is promotion of inter-company alliances in the same region. Also "Agencias" conduct corporate diagnosis and consulting service and hold training programs and seminars for individual companies, although actual services are rendered by outside consultants who are hired by "Agencias".

Although SSPyMEyDR does not provide financial support for Agencia's operating budget, it has been implementing various programs to strengthen the functioning of "Agencias", including those under assistance of foreign donor organizations. These programs include training for Agencia's managers and general employees.

Action Program A proposes the strengthening of INTI to become a national organization promoting dissemination of soft technology. INTI has been selected as the leading agency because it has a national network of offices and related organizations that is considered to be

suitable for implementation of the dissemination activity, as well as INTI's capacity.

"Agencias", as specified in their mission, are in a position to keep close contact with local MEs and SMEs and to provide support that meets their needs. Their personnel is expected to get acquainted with various support schemes targeting SMEs, serve as intermediary for their use, and have expertise and experience in identifying and dealing with specific issues facing SMEs.

The action program is to build up an organization and system consisting of "Agencias" that constitute a national network - similar to that of INTI, which is capable of promoting dissemination of soft technology.

10.2.2 Action Program B1: Training of "Agencia" Staff as "Extensionista PyME"

At present, recruitment of "Agencia" staff is entirely left to each "Agencia", and SSPyMEyDR does not set forth any standard commonly applicable to all "Agencias". Generally, employees are recruited in consideration of Agencia's service that focuses on promotion of use of various financial support schemes as well as promotion of inter-company alliances.

In any country, SMEs often face a variety of problems and strive to overcome them. In many countries, governments and/or private organizations operate counters to address such problems. As discussed in Chapter 7, Japan has SME consulting desks throughout the country, which are operated by the central and local governments or private organizations. These consulting desks serve as one-stop counter capable of addressing both financial and non-financial problems. Argentina should have this type of service, which should then be provided by "Agencias". To maximize the service's effectiveness, the ability of consulting staff who first contacts SMEs plays an important role.

The study team visited several "Agencias" and found that many of their employees were familiar with financial support schemes and were primarily engaged in service to introduce such schemes to SMEs, as well as promotion of inter-company alliances and export promotion. They were less interested in problems relating to internal operation management, e.g., production lines in the manufacturing sector. This is probably because "Agencias" usually hired outside experts to deal with problems facing individual companies.

From the viewpoint of promoting small- and medium-sized manufacturers, however, it is important for "Agencia" staff who communicates with them directly to have basic knowledge on essential technologies for manufacturers, especially soft technology that holds the key to

successful business and production management. Such knowledge allows "Agencia" to deal with problems facing SMEs more effectively and refer them to proper service provided by outside experts.

Under this notion, Japan has a variety of training programs for SME consulting service personnel of support organizations. Although SSPyMEyDR offer training programs for "Agencia" staff, there are few programs covering soft technology.

Action Program A proposes the establishment of INTI's Extensionista PyME training program. As "Extensionista PyME" is considered to be a junior consultant in soft technology, the proposed training program is suitable for "Agencia" staff with little or no experience in factory work or operation.

The proposal has the following two goals: 1) "Agencia" staff acquires basic knowledge on soft technology for manufacturing industries by participating in INTI's Extensionista PyME training program, thereby to improve Agencia's ability to provide adequate support service for customer companies; and 2) Agencia becomes, together with INTI, a core element of promoting dissemination of soft technology in the country by leveraging its nationwide network.

10.2.3 Action Program B2: SSPyMEyDR's Subsidy System for Agencia's Certified "Extensionista PyME"

SSPyMEyDR has once financed labor costs for "Agencia" managers for a short period of time but has not provided financial assistance for Agencia's operation ever since. At present, a plan is underway to supply computers and other office equipment to each "Agencia" under a formal agreement.

In Argentina where decentralization is given of high priority, it is not readily acceptable that SSPyMEyDR sets forth and/or enforces to "Agencias" general standards for their activities or scope of service. Yet, it is very difficult for an organization specialized in support of MEs and SMEs to achieve its objective on its own, financially and otherwise.

In Chapters 4 and 9, the roles to be played by the central government are described as follows.

> "The establishment of a formal system to promote dissemination of soft technology to local SMEs, including education and training on basic knowledge and skills, is one of the important roles that should be played by government. In fact, it is as important as school

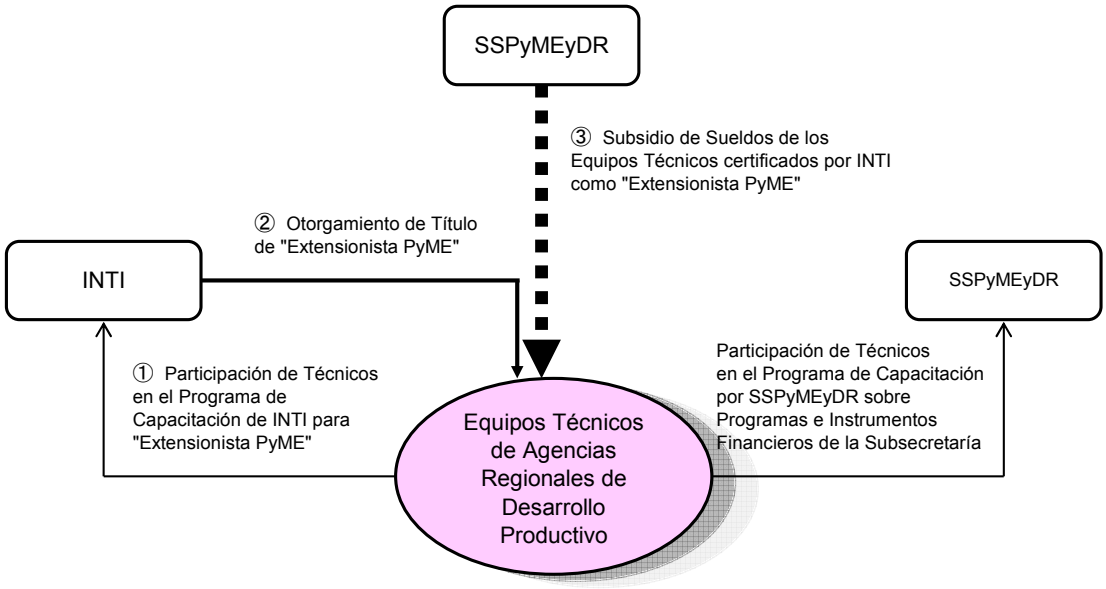
education and should form an integral part of national industrial policy. Its importance remains unchanged under the globalizing environment."

"The fundamental role of the central government should focus on the development of an interindustrial (no sector specific) policy framework and the implementation of nationwide support schemes that are planned within the framework. Support schemes required to improve technology levels of each sector will be implemented by local government that has jurisdiction over the areas where the industrial sector is concentrated. The central government should assume the role to back up such local efforts by providing basic education and training, which is conducive to the upgrading of basic technological capability. Note that "improvement of society's ability to introduce and absorb technology" as well as "reduction of service link costs" can be achieved only under the presence of the central government's sustainable policy and support system. Clearly, they cannot be left to the mercy of the market principle."

Thus, "Agencias" are expected to play a significant role, while there is a strong need for reinforcing their resources and capabilities. At the same time, the central government should play a vital role in supporting independent and continuous activities of "Agencias" that should meet local needs. It is therefore proposed that SSPyMEyDR bear labor costs for "Agencia" staff with professional skills.

To evaluate skills of "Agencia" staff, it is desirable to use the "Extensionista PyME" certification system, which is proposed as Action Program A3. More precisely, SSPyMEyDR will give subsidy to cover Agencias' labor costs under the condition that Agencia staff participate in the training program relating to a loan scheme provided by SSPyMEyDR and in INTI's Extensionista PyME training program.

Fig. 10.5 shows a conceptual view of the SSPyMEyDR's subsidy system that is proposed as Action Program B2.



Source: JICA Study Team

Figure 10.5 SSPyMEyDR Subsidy to "Agencia" Staff Certified as "Extensionista PyME"

10.2.4 Time Schedule for Action Program B

Action Program A4 assumes that INTI's soft technology training course will be offered to other organizations in the second year after the end of the Study, i.e., when the first-generation of "Extensionista PyME" is certified within INTI and they become ready to serve as instructors for the subsequent training course.

Participation of "Agencia" staff in the INTI's Extensionista PyME training program is assumed to occur two years after the end of the Study.

10.3 Action Program C - Operation and Promotion of SME Support Tool (Bolsa de PyME)

10.3.1 Rationale for Proposal

"Bolsa de PyME" is an SME database that is accessible via the Internet and developed by the study team and SSPyMEyDR as part of the model project. The database system has a unique feature that enables a company registered with the database to register and update its own data via the Internet. In Argentina, a large number of company databases are published by trade associations and local governments, but most of them face the update issue and become obsolete and unserviceable. In contrast, "Bolsa de PyME" is an active system that is updated by

registrants themselves.

Unique features of "Bolsa de PyME", not seen in existing databases, are described as follows.

It has two major objectives, namely "promotion of subcontracting" and "publication of recruit information." It publishes data information on companies that want to expand sales channels for their own products by finding customers, those that build the network with other companies, and those that are troubled by the shortage of the workforce, including production capacity data and recruit information. Potential users of "Bolsa de PyME" are: 1) assembly manufacturers of finished products and components, which look for suppliers; 2) companies that want to build a production chain with others that have complementary production processes; and 3) job seekers. Actual contact and negotiation with registrants is left to potential customers.

As discussed in Chapter 9, the development and promotion of the environment to facilitate inter-company trade is strongly demanded by independent parts suppliers and local industry type SMEs - which are closely associated with local communities and economies, and it should therefore be carried out under the leadership of the local government. In Argentina, Agencias Reginales de Desarrollo Productivo set forth policy to promote inter-company linkages as a core element of their non-financial support activities for local industries. The inter-company linkage, in this sense, is not simply limited to subcontracts in the production process and has a broad coverage including materials procurement, market exploration, and HR development. One of the basic support tools is company information and database covering each area. In the case of manufacturers, the company database must contain data indicating production capacities, such as the list of machinery and equipment, factory size, and the number of skilled workers, in addition to general profiles.

In Argentina, trade associations and local governments have a variety of company databases, not to mention the central government's statistical databases. For instance, ProArgentina operated by SSPyMEyDR is a database on export-related companies. However, many of these company databases do not go beyond general profiles of companies and there is no database that is designed for promotion of subcontracting and inter-company relationship in the manufacturing sector.

In many countries which national policy gives priority to the development of the manufacturing industry, there is high demand for the database that can be used for promotion of subcontracting. In Japan, a database designed for such purpose was developed around 15 years ago and it now registers approximately 100,000 companies at present. In Argentina, the study team has

learned that the development of a similar database was attempted twice in the past.

The first one was Bolsa de Subcontratación that was developed and operated experimentally by CIME Rosario between 1981 and 1982. Numerators visited factories for collection of information and company cards containing data such as equipment list and utilization rate were prepared. Companies looking for subcontractors contacted Bolsa's office and received information on candidate companies as selected from those registered on the company cards. The project also aimed at promoting inter-company linkages on a regional basis. However, it was discontinued due to problems relating to the operating fund and the data updating method.

The second database was developed in 1992 under the assistance of UNIDO and under the leadership of UIA and SSPyMEyDR. It contained data on approximately 1,200 manufacturers of mechanical and plastics parts in Buenos Aires, Rosario and Cordoba. Although it was used for a while, it was found to be inadaptable to the Internet environment and has not been used since a few years ago.

SSPyMEyDR, representing the central government, supports "Agencias" mainly through staff training and the development and provision of support tools. As part of its support activities, it plans to build a SME database covering both the manufacturing and non-manufacturing sectors and to use is as a SME support tool through Agencia's activities, but the plan has not been materialized for various reasons. The development of "Bolsa de PyME" under Model Project 2 reflects the agreement between the study team's idea based on the results of the basic study and SSPyMEyDR's desire to realize the above plan.

Bolsa de PyME's second objective - "publication of recruit information" – intends to address the situation facing many companies in the manufacturing sector that is in the recovery phase after the long recession, i.e., they are facing the shortage of skilled workers, engineers and factory operation staff. At present, no database containing updated recruit information is available. Companies registered with "Bolsa de PyME" will be able to recruit employees for both production and administrative divisions.

The original implementation plan for Model Project 2 included system development, publication of the system based on sample data, PR activities, and the establishment of the operation system after publication of the database. As discussed in Chapter 6, however, collection of sample data took a longer period of time than expected, and PR activities and the establishment of the operation system were not completed within the project period, while "Bolsa de PyME" was published officially.

For collection of sample data, cooperation of "Agencias" was expected but it was less than satisfactory due to time and budget constraints. Fortunately, cooperation was obtained from trade associations and local governments, which understood the objective and effect of Bolsa de PyME and requested member companies or local companies to provide data.

In the next section, an operation and maintenance system for "Bolsa de PyME" is proposed as an action program.

10.3.2 Operation and Promotion of "Bolsa de PyME"

Under the model project, a prototype of "Bolsa de PyME" was developed and published. It will be linked to SSPyMEyDR's Web (portal) site. As SSPyMEyDR is already operating a database on export-related companies, ProArgentina, which is on the same Web site, users will be able to access from SSPyMEyDR's portal site to both ProArgentina and "Bolsa de PyME".

To ensure that "Bolsa de PyME" is widely used to meet its objective, it must be operated and maintained by team efforts of SSPyMEyDR, its local staff, and Information System Unit (Unidad de Sistemas de Información: USI). Note that USI is responsible for database maintenance of Proargentina.

(1) Procedures of use of "Bolsa de PyME" (Fig. 10.6)

Companies that intend to be registered with "Bolsa de PyME" need to send an application on SSPyMEyDR's portal site. After examination, SSPyMEyDR issues user ID and password to the applicant, which then can register and update its own data at regular intervals.

1) Application for database registration

Companies and individuals, who intend to be registered with the database, need to input their identification, mail address and provisional password on Bolsa de PyME's registration screen.

2) Examination

SSPyMEyDR examines the application and identification information received from the applicant, and if the application is considered to acceptable, it issues formal ID and password to the applicant by ordinary or electronic mail.

3) Data input

The applicant who has been accepted for registration can log in the registration screen of "Bolsa de PyME" and input the company name, profiles, products, equipment owned, and recruit information. Note that data so inputted are stored in a temporary file until data examination is completed. The formal ID and password can be used for data updating by the registered company.

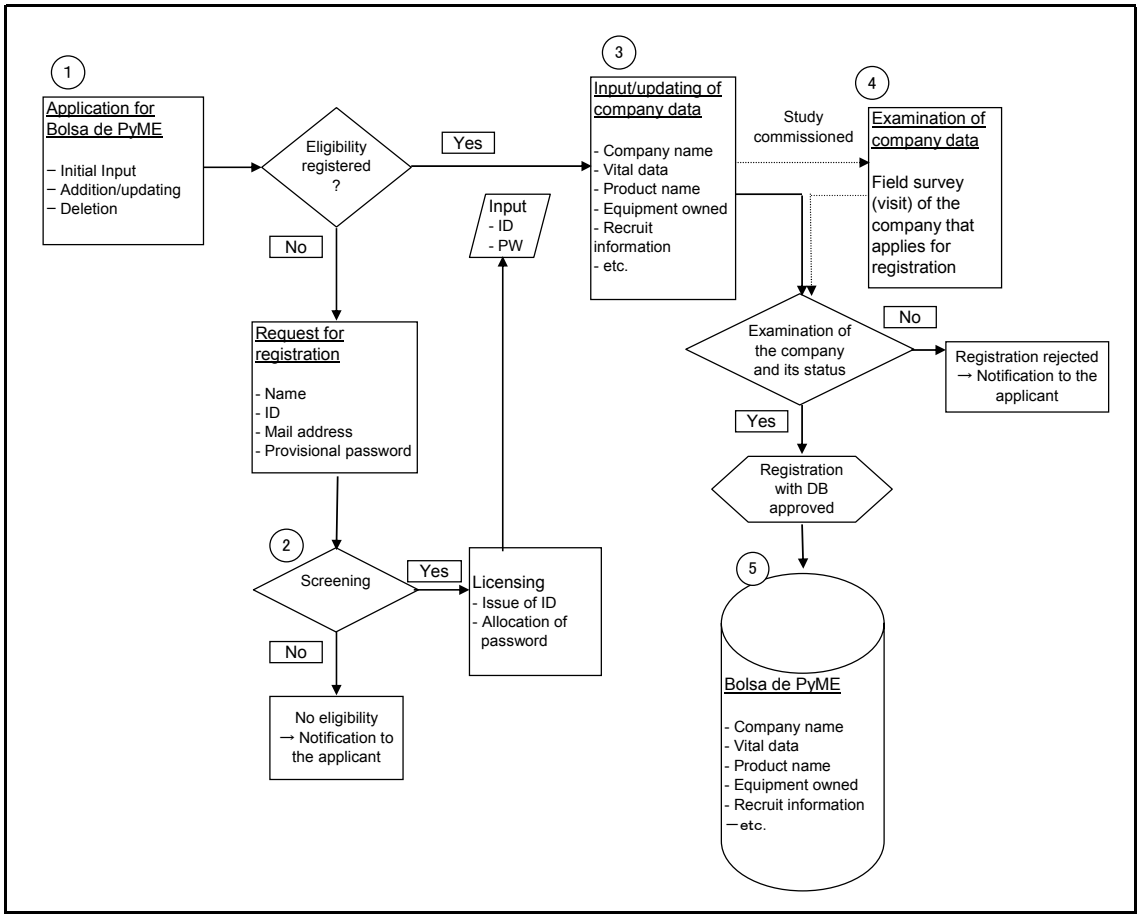
4) Data examination

Data on the registered company, which have been sent to SSPyMEyDR and stored in a temporary file, are checked by local staff, who visits the company to see if the data agree with the company's actual state and conditions.

5) Data registration

The data submitted by the registered company and accepted by SSPyMEyDR in the above examination process are registered with "Bolsa de PyME" and are published.

6) Bolsa de PyME is indicated in Spanish and English and can be accessed from SSPyMEyDR's portal site by users in and outside Argentina. A company or an individual who is interested in a company registered in the database is free to make a direct contact.



Source: JICA Study Team

Fig.10.6 Procedures of Use of "Bolsa de PyME"

(2) Operation system of "Bolsa de PyME"

For smooth operation of "Bolsa de PyME", SSPyMEyDR will establish its operation system that integrates local staff and USI, with a necessary budget allocation.

As discussed in 10.3.1, "Agencias" promoted by SSPyMEyDR set forth promotion of inter-company linkages for supporting local industries, and one of key support tools for the promotional activity is company information and database covering each area, but it is not available now. "Bolsa de PyME" will become an effective tool for "Agencias" to promote inter-company linkages, and its operation and maintenance will require fieldwork and PR activities of local staff who has a close contact with local companies.

"Agencia" will use "Bolsa de PyME" as a local SME support tool, and it will render service required for system operation and maintenance on behalf of SSPyMEyDR.

Division of responsibilities shared by SSPyMEyDR, local staff, and USI is described as follows.

1) SSPyMEyDR

The primary responsibility of SSPyMEyDR is to establish an operation system for "Bolsa de PyME" and to secure a system operation and maintenance budget. Registration and use of "Bolsa de PyME" will be free of charge, and the operation budget should cover registration examination, system maintenance and expansion, and PR activities.

In fact, the next important duty is PR activity to make "Bolsa de PyME" known to the private sector in order to find new registrants and promote use of the database service. As pointed out earlier, PR activity was included in the original implementation plan for Model Project 2, but it was not carried out due to time constraint. SSPyMEyDR's PR activities will be carried out by the following methods.

- Publication of articles on Web sites of the central and local governments in charge of SME support and "Agencias", and the establishment of links to "Bolsa de PyME"
- Publication of articles on bulletins and newsletters of INTI, trade associations such as AFAC and ADIMRA which participated in sample date collection. Also PR activities will be conducted at meetings of INTI with beneficiary companies and of trade associations with member companies to solicit registration and use.
- Promotion of registration and access on the occasion of SME-related fairs and trade shows

Finally, to ensure reliability and freshness of registered data, examination and communication to request a timely update will be required. While actual tasks will be commissioned to local staff and USI, as described in the following sections, SSPyMEyDR will appoint one full-time personnel in charge of PR activities for "Bolsa de PyME" as well as system maintenance.

2) Local staff

As discussed in the procedures for use of "Bolsa de PyME", the company that has received the formal ID and password inputs and sends company profiles, product names, equipment list, and recruit information from the registration screen of "Bolsa de PyME". However, experience gained from operation of the similar databases in other countries indicates that registration and publication of transmitted data without examination creates a risk of

accepting misleading or incorrect information. Thus, the examination process to verify the agreement of registered data with the company's actual state is essential in maintaining public confidence on "Bolsa de PyME" and its data and promoting wider use.

The examination will be carried out by local "Agencia", which will visit the registered company on behalf of SSPyMEyDR to check accuracy of submitted data. "Agencia" will use "Bolsa de PyME" as a SME support tool and will also be involved in PR activity such as recruitment of new registrations, in addition to data examination.

3) USI

USI will be responsible for the following system operation and maintenance tasks relating to "Bolsa de PyME".

a. Database operation and maintenance
Operation and maintenance of the database system, security management of data content, access control, and maintenance and improvement of response performance

b. Operation and maintenance of the application system
Patching of program defects and corrective measures, including development work to meet improvement requirements

c. Network operation and maintenance
Security management to prevent illegal access, sabotage, and virus invasion that may occur in the course of access and use of the database system from inside and outside via the Internet/intranet, and traffic monitoring to maintain and improve access service

d. User ID and password control
Users of "Bolsa de PyME" are authorized, upon examination, to access the database for data registration and update. The person in charge of the system organization (system administrator) controls the access right by issuing an appropriate ID and password[1] and prevents unauthorized access to data or data tampering/destruction.

Sample data registered on "Bolsa de PyME" at the time of its publication have been

[1] "Bolsa de PyME" can set three levels of access rights, namely system, module, and optional levels. According to the access level setting, various limitations can be imposed, such as "input only," "authorized to update (rewrite)," and "authorized to view all information."

collected by SSPyMEyDR and the study team. Now, a formal ID and password should promptly be issued to each of registered companies and a request for examination of registered data and necessary update should be carried out.

e. Request for data update

Data registered on "Bolsa de PyME" are updated by each user who has a formal ID and password. As a result, some users may not update data for a long period of time, resulting in publication of old or incorrect data. To ensure timely updating of registered data, a periodical request should be made to registered companies.

There are various methods for requesting data update, such as the sending of a broadcast message to all registered companies on the same date every year, or the sending of a request mail to companies who are found to have not updated their data for a certain period of time (monitoring of the update status is required). The latter method is suitable for finding data on companies who have gone out of business.

(3) System expansion

SSPyMEyDR plans to expand the coverage of "Bolsa de PyME" into all manufacturing sectors including local, traditional sectors.

"Bolsa de PyME" is designed to achieve "promotion of subcontracting" as the major objective. The model project limits the coverage to automotive, agricultural machinery, and food processing equipment mechanical parts sectors. In the next stage, the system coverage will be expanded to the respective vertical industry sectors led by assembly manufacturers other than mechanical parts suppliers. In Chapter 9, small- and medium-sized manufacturers were classified into subcontractor-type parts suppliers, independent parts suppliers, and SMEs forming local industries. Under this classification, sectors to be covered by the expanded system are subcontractor-type parts suppliers, together with independent parts suppliers that operate on a spot contract basis.

If the future system is to include local industries that supply consumer products and SMEs in the non-manufacturing sector, the objective of the database and data content need to be reviewed and modified.