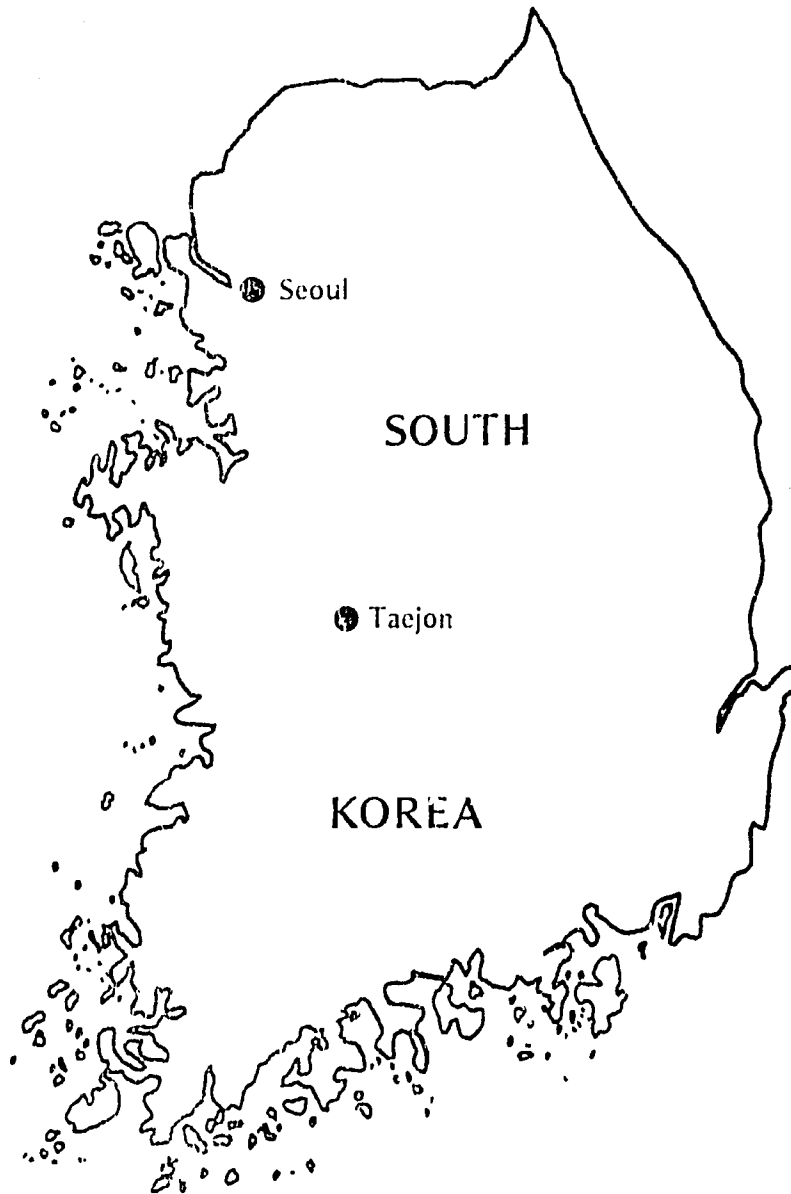


SMALL-SCALE INDUSTRY
GRANT
YEAR II



SOONG JUN UNIVERSITY ACTIVITIES

Grant Period: January 10, 1975 to January 9, 1976

A PROGRAM FUNDED BY THE U.S. AGENCY FOR
INTERNATIONAL DEVELOPMENT

FINAL REPORT
YEAR II

SOONG JUN UNIVERSITY
SMALL-SCALE INDUSTRY GRANT

by
Yoon Bae Ouh
and
Nelson C. Wall

Contract No. AID/ta-c-1062

Economic Development Laboratory
ENGINEERING EXPERIMENT STATION
Georgia Institute of Technology
January 1976

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INTRODUCTION

On January 31, 1975, the Agency for International Development (AID) funded, for the second consecutive year, Contract No. AID/ta-c-1062, through which the Georgia Institute of Technology (GIT) was to make available \$45,000 grants for Small-Scale Industry Development Programs to three institutions of higher learning in different geographic regions of the world. Two of the three grants would be for the continuation of existing programs with counterparts selected in 1974; the third grant would be for a new counterpart to be selected in 1975.

Of the two grants for the continuation of existing programs, one went to Soong Jun University (SJU) in Seoul, Korea. This document is the final or end-of-the-year report for the work jointly performed by the staff of SJU in Korea and GIT in Atlanta, Georgia.

When the grant was initiated in 1974, the administration of GIT and the sponsor established the following criteria for the selection of grantee institutions:

1. Suitability of the national macroeconomic framework for local business conditions.
2. Existence of practicing or potential entrepreneurs.
3. Community concern over unemployment.
4. Existence of potential markets for additional products.
5. Linkages (current or potential) with educational, financial, and business communities.
6. Quality of staff.
7. Institution's potential for utilizing grant effectively.
8. Potential multiplier effects.
9. Host government commitments.

After an initial worldwide search, Soong Jun University was one of the two institutions selected and the corresponding grant was established. The final report for the first year of the program was published in 1975 under the following title: Yoon Bae Ouh and Nelson C. Wall, Final Report--Soong Jun University, Small-Scale Industry Grant (January 10, 1974, to January 9, 1975), Industrial Development Division, Georgia Institute of Technology, Atlanta, Georgia, January 1975.

At the end of the second year of this program, the following immediate results are indicative of the work performed:

1. A survey was conducted to determine the initial effects (at the end of 21 months) of this program on 19 small-scale industries that had received technical assistance. A total of 575 jobs had been created (a 66% increase in employment) and reported productivity and profit gains varied from 20% to 200%.

2. On-site technical assistance was provided to 11 different companies in the Seoul area and 17 in the Taejon area for a total of 28 cases during the year.

3. Five programs of quality control were established at the SJU Computer Center and on-site training on quality control methods was provided to interested persons.

4. New interinstitutional agreements were established between SJU and the following two Korean agencies:

The Industrial Advancement Administration (IAA) of the Ministry of Commerce and Industry

The National Federation of Medium Industries Cooperatives (private organization supported by Korean government)

5. A grant was provided by SJU to the Director of the Integrated Development Center to study the socioeconomic effects of this program in Yong-In, Kyoungy Province.

6. A simple production fixture was designed for a small-scale industry.

7. The EDL staff provided on-site consultation to the SJU staff during the period.

8. The audiovisual documentation for Year II of the program was completed.

9. The College of Engineering has established the Department of Industrial Engineering and is offering the curriculum that was prepared during Year I.

10. Three persons were sent from SJU to EDL headquarters in Atlanta for training.

11. Training programs, lectures, and seminars were presented during the year by the joint SJU and EDL staff.

12. The ITI staff at SJU was increased by three new professional persons in the Departments of Electrical, Chemical, and Industrial Engineering.

PROGRAM PLANS FOR YEAR II

Background

Soong Jun University (SJU) is a prominent Korean institution of higher learning with strong programs in science, engineering, and management-oriented fields. This university was formed in 1970 when Soong Sil College united with Taejon College to form a new cooperative venture in the field of Christian education. Soong Sil College, in turn, was formed in Pyeng Yong (North Korea) in 1897 and reopened in Seoul in 1954, after being closed in 1938 during the Japanese occupation. Taejon Presbyterian College was founded in 1954 by the Southern Presbyterian Mission in the city of Taejon.

Shortly after Dr. Hahn Been Lee became President of Soong Jun University in 1973, he was contacted by Mr. Ross W. Hammond, Director, Economic Development Laboratory (EDL) of the Engineering Experiment Station at the Georgia Institute of Technology. As a result of these contacts, both institutions established an agreement of mutual cooperation on July 30, 1973.

SJU then presented a proposal to the Georgia Institute of Technology for a Program of Development for Small-Scale Industries. It was implemented by a grant funded under an existing contract provided to the Georgia Institute of Technology by the Agency for International Development (AID) for this purpose. In 1974, the EDL, in cooperation with SJU, initiated Year I of a program of small-scale industry development. This program was expanded in 1975 (Year II) under funding by the same sponsor.

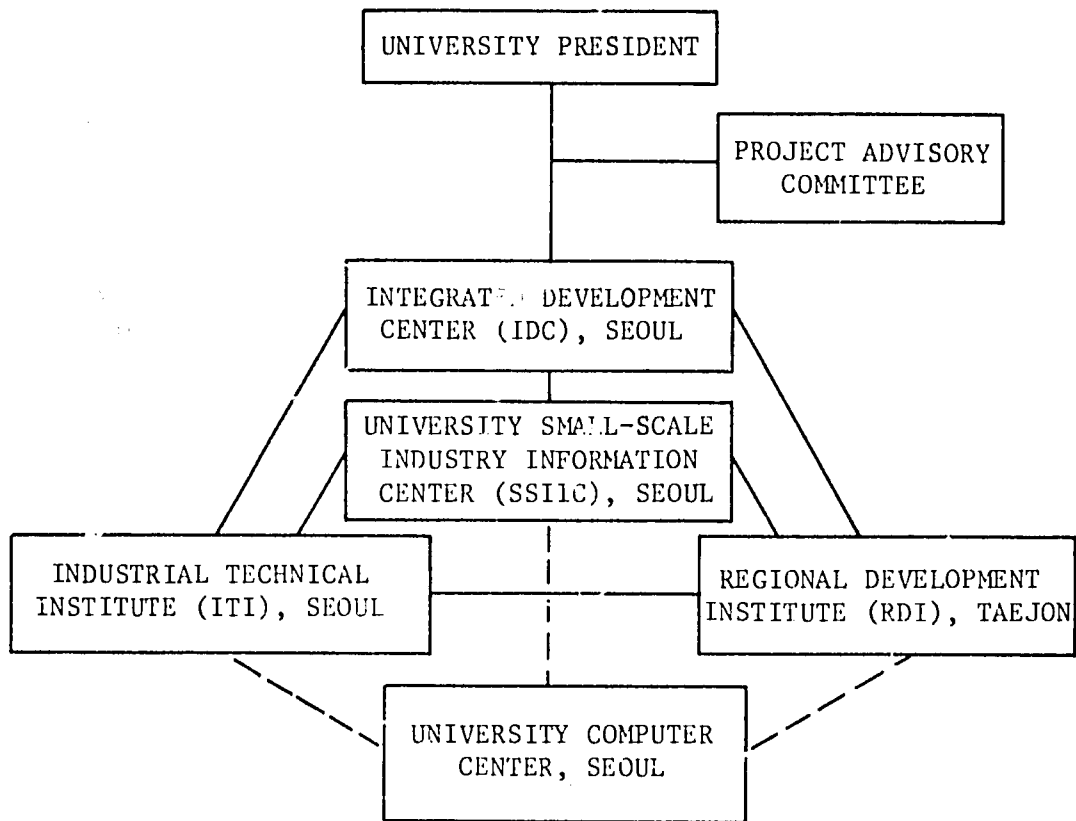
The terms of the \$45,000 grant permitted the grantee to use half of the grant funds for personnel, travel, materials and supplies, conferences, etc. The remainder of the funds was to be used by the grantee to obtain training and consultation from U.S. technical assistance organizations.

The Georgia Institute of Technology and the Technology and Development Institute, East-West Center, subsequently contracted with the grantee to provide training services and an audiovisual documentation of the project.

The Integrated Development Center (IDC) of Soong Jun University was assigned the responsibility of all program activities for Year II and served as a counterpart to the International Development Branch of EDL.

At the time the Year II program was initiated (on January 10, 1975), the SJU organizational structure was as presented in Figure 1.

Figure 1
ORGANIZATIONAL STRUCTURE OF
SOONG JUN UNIVERSITY
(January 1975)



Dr. Hahn Been Lee, President of Soong Jun University (SJU), named Dr. Yoon Bae Ouh, Head of the Integrated Development Center (IDC), to serve as Counterpart Project Director. Mr. Nelson C. Wall is Project Director for Georgia Tech's portion of the program.

Objective

It is the continuing objective of this project to build a program of industrial extension for small-scale industries at Soong Jun University. Three main areas of activity were considered for Year II: (1) provision of engineering, managerial, scientific, and technical assistance to small-scale industries in defined geographic areas of the Republic of Korea, (2) provision of on-site consultation by staff members of EDL, and (3) strengthening the relevancy of the existing educational program of the university.

At the end of this multi-year project, the sponsor anticipates that SJU will have in operation a well-trained staff that will be fully capable of continuing the provision of technical assistance services to small-scale industries in the area. This service will be provided by the then technically competent members of the SJU indigenous staff trained under this program.

Total Project Goals of the AID/ta-c-1062 Contract

At the start of the Small-Scale Industry Grant on January 23, 1974, the following total goals had been established by the Agency for International Development for the Georgia Tech grant, to be achieved over a period of four years: "The general objective of this contract is to generate employment in developing countries, particularly outside the metropolitan centers, by: (a) strengthening the capability of a selected institution in each country to provide effective technical assistance to local small industry, (b) demonstrating and documenting the impact of alternative approaches to technical assistance to small industry, and (c) infusing the governmental, industrial, and financial sectors of the local community selected to provide employment with an understanding of the techniques of generating jobs. The above objectives will be carried out through the use of grants to selected Lesser Developed Country (LDC) organizations."

Once the total project goals are reached, the sponsor anticipates the following outputs:

1. Increased job opportunities in four countries.
2. Increased viability of indigenously owned enterprises.

3. Improved capability of four LDC institutions to serve small industry.
4. Tested methodologies for strengthening LDC institutions.
5. Evaluation reports on successes and failures in assisting small industry.

All the established goals for Year II were met, plus several additional accomplishments which were listed in the introduction and will be amplified in the balance of this final report.

Program of Work

The Year II proposal presented a program of work on the basis of the work that had been implemented and evaluated during the first 12 months of the project. The following activities were then scheduled for the second 12-month sequence (Year II), all of which have been implemented:

1. Organization. As indicated by Figure 1, several organizations within SJU were concerned with the implementation of this program. These organizations were the Integrated Development Center (IDC), the Industrial Technical Institute (ITI), and the Regional Development Institute (RDI). All programs were to be oriented to serving the small and medium-scale industries in the selected municipalities.

2. Staff and Physical Plant. Once the basic needs of the different units had been identified, appropriate office space, equipment, and manpower were allocated to assure basic logistical support to this project. Three new faculty members joined the Industrial Technical Institute staff--one each from the Departments of Electrical, Chemical, and Industrial Engineering.

3. Project Policy. The program continues to require a multiple input-output system, but it has a basic theme--Stimulation of New and Existing Small and Medium-Scale Industries in Korea.

4. Program Areas. The SJU Project Director and his counterpart at EDL jointly designed a viable program to assure the implementation of the following activities during the second program year:

- a. Small-Scale Industry Information Center (SSIIC). This center was established during Year I of the program and had the responsibility of collecting and generating the basic data relevant to the project. The initial collection of information would focus on management and technical data appropriate to small-scale industries.

For Year II, it was planned that increased emphasis would be given to the following areas of work:

- (1) Collection, classification, and dissemination of pragmatic, up-to-date information on Korean and international material important to the small-scale industries.
- (2) Promotion of wider cooperation and coordination between small-scale industries, the community, and SJU.
- (3) Additional on-site consultation and assistance from the IDD senior staff as needed.
- (4) Implementation of the guidelines established during Year I for the operation of the SSIIC.

b. Industrial Training and Education. The successful short-term training program for the SJU staff that was carried out during Year I was to be followed by others during the second year. The programs would be offered to small industry managers, engineers, and to entrepreneurs in general.

- (1) Presentation of educational programs (short-term) during the year, with consultants assisting in on-site programs. The following areas were considered:
 - o Management seminars (e.g., bill collection, taxation, sales, promotion, work improvement, quality control)
 - o Training for students who are to be involved in local industry technical assistance services
 - o Entrepreneur promotion (e.g., motivation, proposal preparation, accounting, sales)
- (2) Continuation of the audiovisual case history started in Year I.
- (3) Additional staff training in accordance with needs.

c. University Training and Education. At the end of Year I, Soong Jun University was starting to get some of the feedback resulting from the activities of the year. An Industrial Engineering program was designed and was approved by the Ministry of Education in 1974. SJU made plans to offer the new program in Industrial Engineering by the fall of 1975.

The following additional activities were scheduled for the second year:

- (1) Continued preparation of classroom material and course work for the Industrial Engineering Department, to be used by the fall of 1975.
- (2) Continued review and reform of the university curriculum.

- (3) Identification of specific effects on university educational policies and practices as a result of these industry-oriented programs.

d. Industrial Extension and Research Activities. At the end of the first year, policies and methods had been established which permitted SJU to link up with existing small industries in the target areas and numerous technical assistance activities had been carried out. The plans for Year II considered the following activities:

- (1) Pragmatic technical assistance by SJU staff members in the following four major areas:
 - o Mechanical Engineering: Four or five companies at Yeong Dung Po Industrial Complex and three to five small companies in Kyung Ki Province were to be selected for concentrated service. Emphasis was to be given to quality control, simple tool design, and general training.
 - o Electrical Engineering: Three to five small companies in Kyung Ki Province of the Seoul area would be selected for diagnosis and service. Emphasis was to be given to electrical economy, safety, and general training.
 - o Chemical: Three small companies would be selected for concentrated effort in the Taejon area.
 - o Textile: Two small companies in the Taejon area would be selected.
- (2) Managerial technical assistance would be provided during this year, with emphasis on the following activities:
 - o Studies on improving market strategy and financial strategy.
 - o Recommendations for better inventory control for effective productivity.
 - o Studies on better accounting methods available for small industries.
 - o Time and motion studies and methods work.
 - o Feasibility studies for establishing new small industries.
 - o Cost accounting and other control studies for small industry.

Use of Grant Funds by SJU

For the 1975-76 grant year, the grantee was funded in the amount of \$45,000. These funds were disbursed in the following manner:

<u>Expenditures</u>	<u>Sources of Funds</u>			
	<u>AID</u>	<u>Ind.-Univ.^{1/} Foundation</u>	<u>SJU^{2/}</u>	
Direct salaries, wages	\$13,500	\$5,000	-	\$18,500
Travel				
International \$4,000	4,000	-	-	4,000
Local \$2,750	2,000	750	-	2,750
Materials/supplies	2,000	-	-	2,000
Conferences/seminars	1,000	-	-	1,000
Contracted services (GIT/IDC)				
q SJU personnel training	10,500	-	-	10,500
EDL consulting	10,000	-	-	10,000
TDI (E-W Center)				
Av. case work	2,000	-	-	2,000
SJU indirect expenses				
General overhead	-	-	\$8,000	8,000
Technical service support	-	-	3,000	3,000
Totals	\$45,000	\$5,750	\$11,000	\$61,750

^{1/}The Industry-University Cooperation Foundation is a newly established (1974) organization in Korea designed to promote mutual cooperation from which SJU applied for and received a grant.

^{2/}Normal overhead allowance plus depreciation allowance for use of university labs and workshops.

SOONG JUN UNIVERSITY ACTIVITIES DURING
PROGRAM YEAR II

The SJU staff, on both the Seoul and Taejon campus, carried out the major portion of the work programmed for Year II. The following sections highlight some of the activities for the year.

Small-Scale Industry Information Center (SSIIC)

As indicated in the Year I final report, this unit was established in 1974, during which time the EDL on-site staff assisted in establishing guidelines for the classification of the collection and determining the future acquisitional needs. Unfortunately, during Year II, the SSIIC has not met the original expectations. The person on the SJU staff responsible for the SSIIC left SJU and has not been replaced.

It now appears that the SSIIC will be relocated to the Department of Industrial Engineering, where it will become part of the Engineering Library and cease to be a separate unit. During this past year, the Head of the International Development Data Center of the EDL was on-site for a period of two and a half weeks to assist in correcting this unfavorable situation, but he felt severely hampered due to several existing factors and no positive actions were taken to implement his recommendations. It is possible that once the new Engineering Information Center becomes operative, it will take over the original objectives that were established for the SSIIC.

Industrial Training and Education

As part of the program of work in this area, a five-week training program was scheduled, beginning on July 1, 1975, and was presented at the EDL headquarters in Atlanta, Georgia. SJU sponsored three participants in this program--two of them were members of the staff and the third person was an industrialist. The three participants were:

Prof. Won-Hoe Koo, Head Chemistry Department, SJU, Taejon

Prof. Young-Ho Lim, Assistant Head, Mechanical Engineering, SJU, Seoul

Mr. Young-Ho Chae, President of the Sam-Ho Machine Industries Company

The five weeks of training included one week in Atlanta, Georgia, and four weeks of visits to industrial plants and rural small-scale industries in the state of Georgia. Appendix 1 of this report provides a listing of subjects

covered during the training, as well as an outline of the week of activity in Atlanta, Georgia. Through this exposure to the EDL's industrial extension service facilities and the methodology presented during the training program, the participants will be able to increase their inputs to the SJU small-scale industry development program.

During this second year, the SJU staff was able to establish five programs for quality control for their IBM 1130 at the Computer Center. The programs were established during the time Dr. Kenneth Stephens of the EDL staff was on-site in Korea. These computerized quality control programs will assist the small-scale industries that need to improve their quality control standards. Also during Dr. Stephen's visit, a series of conferences were held with the SJU engineering faculty on quality control problems and teaching techniques. Several teaching aids were designed and built for future use of the students and staff.

As part of the training and education activities, the SJU staff, together with Dr. Stephens, presented a series of seminars organized by the Korean Chamber of Commerce and Industry on the subject of quality control. These seminars were presented in Seoul, Taejon City, and Incheon City to a total of about 500 persons.

Under the program for Year II, the audiovisual documentation was continued by staff members of the East-West Center, Hawaii, from September 21 to September 27, 1975. The audiovisual for Year II covers some of the technical assistance cases and some selected new cases. These audiovisual materials are available to other interested organizations.

University Training and Education

When this program was initiated in 1974, it was determined that since SJU was a technologically oriented institution, it would be desirable to assist it so that it could expand its engineering programs to include industrial engineering. It was anticipated that through such an extension, future SJU graduates could participate more usefully in the industrial development of the nation.

As a result of this action, by the end of 1974 the appropriate national authorities allowed SJU to establish the Department of Industrial Engineering, as part of the College of Engineering at SJU. The Dean of Engineering, Dr. Clarence E. Prince, has worked closely with the EDL academic staff during Year II to enhance the existing program being offered by the Department of

Industrial Engineering. The latest addition to the SJU academic staff has been Mr. Pyung-Kyu Choi, an industrial engineer.

It has been a secondary objective of this program to identify specific effects on university educational policies and practices generated by or resulting from these industry-oriented programs at the university. In an attempt to define this problem area, Dr. Yoon-Bae Ouh, Director of the Integrated Development Center (IDC), was granted funds by SJU to conduct a survey on the socio-economic effects of this joint program in Yong-In, Kyoungyong Province.

Industrial Extension and Research Activities

This continues to be the main portion of the joint program of work. It was planned originally to provide technical assistance to small-scale industries using the industrial extension service approach. This part of the program also covers instances of applied research activities which have been incorporated into the total project. According to the records of the SJU staff, during Year II, 11 different companies were provided technical assistance in the Seoul area and another 17 companies in the Taejon area. The records also indicate that a total of over 139 visits were made to these 28 industries during the year, for an average of about five visits per company receiving technical assistance service. It is further reported that in spite of the continuing economic depression in Korea, many of the companies receiving this service have been able to increase production and employment levels, as well to expand their domestic or export sales. A listing of the companies serviced with particulars on each case is presented as Appendix 2 of this final report.

Employment Generation

Another interesting development in the Year II program conducted by the SJU staff was a survey of 19 companies (12 in Seoul and seven in Taejon) that had received technical assistance during the period from January 1974 to September 1975. The survey's purpose was to determine the employment changes within the selected assisted industries. It shows a gain of 95 new jobs in the Seoul area companies and 481 in the Taejon area companies for a total of 576 jobs, or a 66% increase over the original 868 jobs at the start of the technical assistance service. A summary of the survey results, as reported by SJU, appears as Tables 1 and 2 of this report.

Table 1
SUMMARY OF COMPANIES ASSISTED
BY SOONG JUN UNIVERSITY, SEOUL
1975

<u>Technical Assistance Case No.</u>	<u>Duration of T. A. (Months)</u>	<u>Employment</u>		
		<u>Start</u>	<u>Present</u>	<u>Variance</u>
1	21	38	28	-10
2	21	17	14	-3
3	21	7	8	+1
4	21	15	20	+5
5	21	7	22	+15
6	21	8	18	+10
7	21	14	14	0
8	21	104	142	+38
9	12	37	36	-1
10	21	19	30	+11
11	21	52	52	0
12	18	<u>79</u>	<u>108</u>	<u>+29</u>
	Total	397	492	+95

Source: Soong Jun University, Survey Data, Fourth Quarter, 1975.

Table 2
 SUMMARY OF COMPANIES ASSISTED
 BY SOONG JUN UNIVERSITY, TAEJON
 1975

Technical Assistance Case No.	Duration of T. A. (Months)	Employment		Variance
		Start	Present	
A	6	31	38	+7
B	6	17	16	-1
C	18	22	32	+10
D	21	77	77	0
E	18	269	720	+451
F	21	46	56	+10
G	6	<u>9</u>	<u>13</u>	<u>+4</u>
	Total	471	952	+481

Source: Soong Jun University, Survey Data, Fourth Quarter, 1975

Appropriate Technology

The Year II program emphasized the area of appropriate technology, particularly those technologies relevant to the needs of the Korean communities involved in the project. Although Korea is an industrial society, much of the production continues to be small-scale by international standards. The unique conditions of the Korean culture and the need for intensive labor solutions to the individual problems make it mandatory that appropriate technology choices be made in providing a solution to a given situation.

Since the start of this program, the joint staff has been able to design, build, and field test four devices which are considered by the staff to be appropriate technology for the small-scale industry sector of the host country.

These devices are:

- o A low-cost tensile strength tester
- o A sizing or shaving die for truing up metal rod cross sections
- o A low-cost immersion pyrometer
- o A wheeled version of the "chegae," the traditional means of back-pack transport of materials.

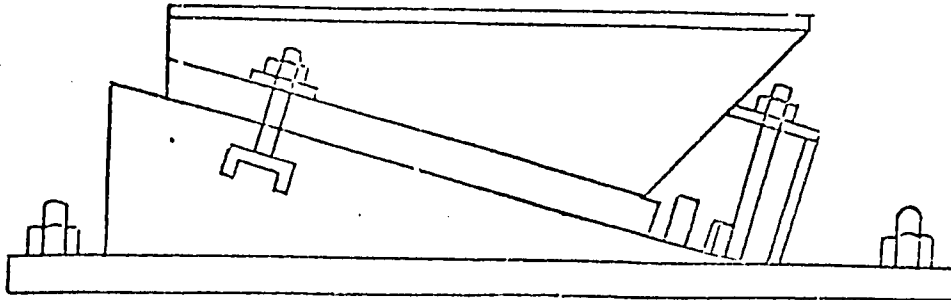
Other Activities

In the engineering process of providing the necessary technical assistance to the industries in the selected areas, the SJU staff was able to identify the need for the development of a jig or fixture which would provide effective and accurate machining at the Sam-Ho Machine Industries Company. After some 20 man-hours of service to the company, actual plans for a set of fixtures were completed. A copy of the original fixture design is presented on the following page as Figure 2. The SJU-designed fixture is now in operation at the Sam-Ho Company and is producing very satisfactory results.

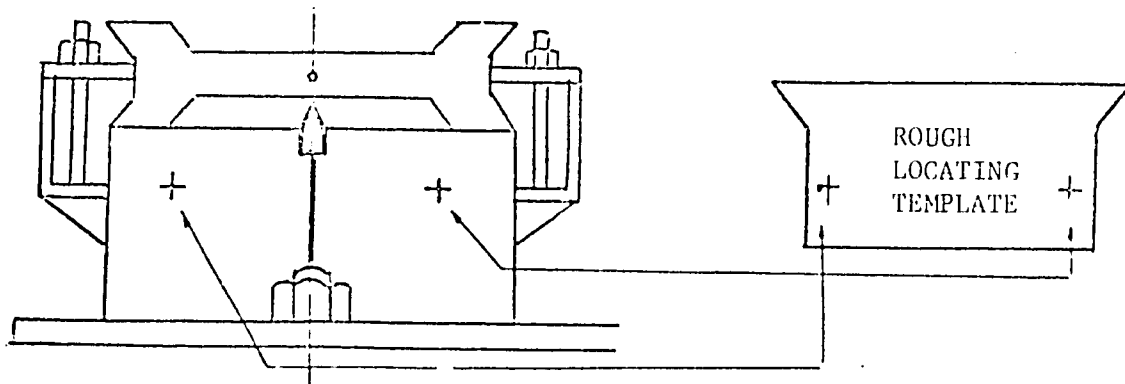
The Industry-University Cooperative Committee implemented a wider program during this year. As a direct result of this broader involvement, the National Committee of the Federation of Small Industries of Korea (NCFSI) asked SJU to participate in its technical service program in recognition of the results generated by the Integrated Development Center of SJU. At present, the SJU staff is providing joint industrial extension services with NCFSI staff to two Korean companies.

Figure 2

FIXTURE DEVELOPED BY SJU STAFF FOR
SAM-HO MACHINE INDUSTRIES COMPANY, KOREA



1. Locate raw casting on slant top fixture. 520 x 280 is first reference surface.
2. Machine 355 x 325 surface.
3. Locate and on boss by using 230 dimension.
Locate center of boss by reference 355 x 325 surface.
Punch center. Outer surface of boss is reference surface; punch mark is other reference point.



4. Locate casting on slant top fixture. Slide punch mark to stop. Use 230 dimension to align. Machine male dovetail surfaces.
5. Locate casting on slant top fixture. Slide male dovetail into dovetail fixture. Machine female dovetail surfaces.
6. Locate casting on drill fixture using male dovetail as clamping surface. Drill 20 mm hole.

Another new inter-institutional agreement for the year is one with the Industrial Advancement Administration, which is a very powerful group in the Korean industrial sector.

GEORGIA INSTITUTE OF TECHNOLOGY ACTIVITIES
DURING PROGRAM YEAR II

The EDL activities under Year II of the program were initiated by the Project Director on January 10, 1975, when the sponsor advised the Georgia Institute of Technology that the small-scale industry project for Korea would be extended another year. Through the month of January, the Project Director designed the program and consulted with the SJU staff to assure the appropriate emphasis. As per the project plan, Mr. Ben James was to be on-site by early April 1975. He would then be followed by Dr. Kenneth Stephens, Mr. Richard Johnston, and Mr. Larry Edens. Other members of the EDL staff also would interface with the Korean staff, but under a separately funded project.

Each of the EDL staff members was then assigned specific tasks within the total scope of the project. A brief summary of the individual activities follows in chronological order. Figure 3, on the following page, delineates the Project Plan for Year II.

January 26-February 2, 1975 (Dr. Joseph Pettit)

As President of the Georgia Institute of Technology, Dr. Pettit made a project administration visit to Soong Jun University to further improve the professional interaction between these two institutions of higher learning. This activity was funded under a separate grant to the Georgia Institute of Technology sponsored by the Agency for International Development.

January 26-February 2, 1975 (Mr. Ross W. Hammond)

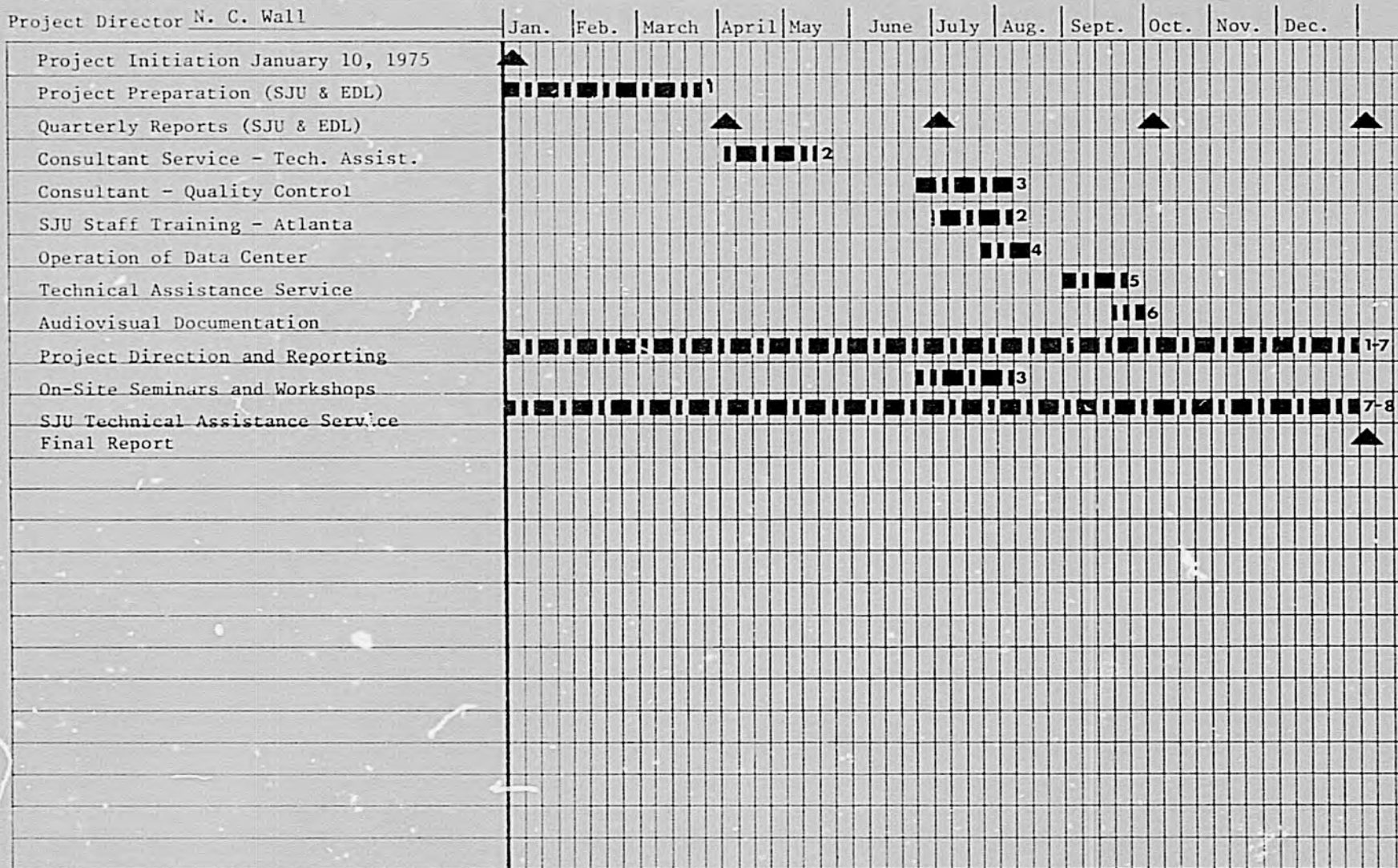
The purpose of Mr. Hammond's trip was to review the status of the project and assist in the planning of the activities for Year II. During his stay, he provided administrative guidance and counseling to the Counterpart Project Director and to his staff. This on-site activity was also funded under Georgia Tech's AID 211(d) grant.

April 3-May 11, 1975 (Mr. Ben James)

It was Mr. James' responsibility to assist the SJU staff in their industrial extension service activities and to serve as a consultant to the small-scale industries, working with SJU in both the Seoul and Taejon areas. Due to his great experience in the area of technical assistance to small-scale industries in Georgia, Mr. James was able to personally assist the SJU staff in

FIGURE 3
PROJECT PLAN

Project No. B-426
 Project Title SIG-SJU-YEAR II
 Project Director N. C. Wall



LEGEND Staff

1 N. C. Wall	4 R. Johnston	7 Y. Ouh
2 B. James	5 L. Edens	8 SJU Staff
3 K. Stephens	6 Burian-Udunka	

resolving the majority of the cases that are presented in detail in Appendix 2.

April 3-April 12, 1975 (Miss Kay Ellen Auciello)

Sponsored under a separate grant from the Agency for International Development to the Georgia Institute of Technology, this member of the EDL staff provided direct assistance to the Small-Scale Industry Information Center (SSIIC) at SJU. Unfortunately, Mr. Lee, who had been in charge of the SSIIC, had left SJU by the time Miss Auciello arrived. During her stay, she worked with Dr. Ouh, Counterpart Project Director, and a graduate student in reviewing the shortcomings of SSIIC and in formulating recommendations.

June 29-August 2, 1975 (Dr. Kenneth Stephens)

During the Year I program, the EDL staff had repeatedly indicated to the Project Director that one of the main problems facing the small-scale industries being served was quality control. Dr. Stephens, a specialist in that subject, had this on-site assignment under the Year II program. Among other results, Dr. Stephens was able to install five quality control programs using the IBM 1130 computer at the Seoul campus Computer Center. During his stay, he also conducted a number of seminars on appropriate quality control methods for small-scale industries. These seminars were presented in various cities (Seoul, Taejon, and Inchon); they were attended by members of the SJU staff and by the industrial management community.

July 1-August 2, 1975 (Counterpart Training)

Two senior members of the SJU staff and a Korean industrialist participated in a five-week training program at the EDL headquarters in Atlanta, Georgia. The participants were Prof. Won-Hoe Koo, Head of the Chemistry Department at SJU, Taejon campus; Prof. Young-Ho Lim, Assistant Head of the Department of Mechanical Engineering, SJU Seoul campus; and Mr. Young-Ho Chae, President of the Sam-Ho Machine Industries Company. The training program, as designed by Mr. Ben James of EDL, had various forms of training, including classroom activities, on-the-job situations, guidance, consultation, industrial tours, and general contacts within the state of Georgia. A complete list of subjects covered during the training program is presented as Appendix 1.

July 22-August 7, 1975 (Mr. Richard Johnston)

In view of the shortcomings identified in the operation of the SSTIC earlier in the year, it was decided that Mr. Richard Johnston, Head of the International Development Data Center (IDDC) of EDL, should go to Korea and provide additional technical assistance on this subject to the counterpart institution. As a result of his on-site review, Mr. Johnston left with the Counterpart Project Director a set of recommendations which, hopefully, would be implemented at the SSTIC.

September 1-September 20, 1975 (Mr. Larry Edens)

The principal on-site task assigned to Mr. Edens was to continue the program of work initiated by Mr. James in April of this year. Mr. Edens of the EDL staff had the responsibility of continuing the provision of technical assistance, together with SJU staff, to the industries described in Appendix 2.

September 7-October 3, 1975 (Mr. Harvey Diamond)

This member of the EDL staff was sponsored under a separate AID grant and was in Korea to conduct a research project on the export potential of small-scale industries in that country. As a result of his research, a report has been published entitled Export Potential of Selected Korean Small-Scale Industries. All the companies researched for this purpose by Mr. Diamond are being provided technical assistance services under this program.

September 20-September 27, 1975 (Mr. Fred Burian)

Funded under a separate contract, Mr. Burian of the East-West Center, Hawaii, visited SJU. During his stay, he taped audiovisual documentation of the most relevant cases of technical assistance provided to small-scale industries during the year. Full details of these activities are reported in the companion Final Report on Administration Project A-1600 for this year. Assisting Mr. Burian in the audiovisual documentation was Mrs. Edwina Udunka of the EDL staff.

September 20-September 25, 1975 (Dr. Thomas Stelson)

As Vice President for Research of the Georgia Institute of Technology, Dr. Stelson was funded under Georgia Tech's AID 211(d) grant. He conducted a project administration visit to Soong Jun University and interfaced with the academic and project staff at SJU.

September 20-September 27, 1975 (Mr. Ross W. Hammond)

This was considered the last on-site contact for program Year II. Mr. Hammond, Director of the Economic Development Laboratory, together with Dr. Ouh, Counterpart Project Director, prepared the third-quarter report for this program year. During his stay, Mr. Hammond also contacted many of the small-scale industries receiving technical assistance services and provided counseling to Mr. Burian in taping the audiovisual documentation.

RESULTS AND RECOMMENDATIONS

The second year of this small-scale industry development program has had many positive results, a number of which were briefly listed in the introduction section of this final report. In this section, the major accomplishments of Year II will be highlighted:

1. The professional staff at SJU conducted an in-depth survey of 19 small-scale industries that are presently in this program. These companies have been recipients of the technical assistance service for periods no longer than 21 months and not less than six. In summary, the SJU survey reports that 576 new jobs have been created in these 19 industries, 66% increase in employment.

2. The joint SJU/EDL staff was able to provide technical assistance to a total of 28 small-scale industries, of which 11 were in the Seoul area and 17 in the area of Taejon.

3. A specialist from the EDL staff was able to establish five programs of quality control at the SJU Computer Center for future use by the small-scale industries under this program. Furthermore, on-site training in quality control was made available to the SJU staff and other interested persons.

4. Soong Jun University expanded its interinstitutional activities and entered into agreements with both the Industrial Advancement Administration and the National Federation of Medium Industries Cooperatives.

5. The Counterpart Project Director, Dr. Ouh, was awarded a grant by SJU to study the socioeconomic impact of this program at a location within the Kyoungyong Province of Korea. The results of this study may provide some very valuable inputs to this program.

6. A simple production fixture was designed and constructed for a participating small-scale industry. Since the start of this program, the joint staff has also developed four devices in the field of appropriate technology, as follows:

- o A low-cost tensile strength tester
- o A shaving or sizing die for truing up metal rod cross sections
- o An inexpensive immersion pyrometer
- o A wheeled version of the "chegae" or Korean backpack

7. On-site consultation was provided by the EDL staff to both the counterpart staff and the participating small-scale industries.

8. A meaningful training program with great pragmatic orientation was specifically designed for and presented to three persons sponsored by SJU. One of the participants was a Korean industrialist and the other two were from the SJU academic staff.

9. The Dean of Engineering has established under the College of Engineering the Department of Industrial Engineering. This is a direct result of the activities initiated during Year I by the joint staff.

10. A continuation of the audiovisual documentation was taped. This Year II documentation covers many of the interesting technical assistance cases which are described in detail in Appendix 2.

11. Several training programs, lectures, and seminars were offered to interested persons during the year by the joint staff.

12. The professional staff of SJU was augmented by three persons--one each in the Departments of Electrical, Chemical, and Industrial Engineering.

One may conclude by saying that during the year, not only have these achievements taken place, but more important, the participating small-scale industries in the selected areas have had a service in the technical assistance field which was previously unattainable.

Appendix 1

SUBJECTS COVERED DURING EDL TRAINING
PROGRAM FOR SJU-SPONSORED PARTICIPANTS

LIST OF SUBJECT TITLES

- An Approach to Furnishing Industrial Extension Services to Small-Scale Industry
Outline Guide
- The Generation and Evaluation of Venture Ideas
Outline Guide
- Selection of Appropriate Technology
Appropriate Technology
- Resource and Technical Analysis
- Advising the Prospective Entrepreneur on Going Into Business
Outline Guide
- A Systematic Approach to Small-Scale Industry Growth
- The Presentation of Investment Proposals
Outline Guide
Handout
Evaluating Capital Investment Alternatives
- Factors in Plant Layout
Guide to Factors in Plant Layout and Materials Handling
- A Simplified Cost and Control System for the Small Industrial Concern
A Simplified Cost and Control System
- Inventory Control for Small-Scale Manufacturing
Guide to Inventory Control for Small-Scale Manufacturing
- Production Planning and Control for Small-Scale Manufacturing
Production Planning and Control for Very Small-Scale Manufacturing
- How to Use a Private Management Consultant
- Work Sampling
- Quality Control for Small-Scale Manufacturing
- Export Opportunities for the Small Manufacturer

FIRST WEEK OF ACTIVITY

Outline

June 30	Indoctrination	Ross Hammond and Staff
July 1	9:00 a.m.	"An Approach to Furnishing Industrial Extension Service to Small-Scale Industry" - William Craig and Richard Johnston
	1:30 p.m.	"Selection of Appropriate Technology" and "Resource and Technical Analysis" - William Studstill
July 2	9:00 a.m.	"Inventory Control for Small-Scale Manufacturing" - Lynn Tessner
	1:30 p.m.	"Production Planning and Control for Small-Scale Manufacturing" and "Work Sampling" - Lynn Tessner
July 3	9:00 a.m.	"Factors in Plant Layout" and "Materials-Handling Equipment Needs" - Philip Hess
	1:30 p.m.	"Quality Control" - William Darley
July 7	9:00 a.m.	"The Presentation of Investment Proposals" - R. L. Hughey
	1:30 p.m.	"Export Opportunities" - Larry Edens
July 8	9:00 a.m.	"The Generation and Evaluation of Venture Ideas" and "Advising the Prospective Entrepreneur on Going Into Business" - Eddie Lewis
	1:30 p.m.	"A Simplified Cost and Control System for the Small Industrial Concern" and "Evaluating Capital Investment Alternatives" - Sherman Dudley

Appendix 2
SUMMARY OF TECHNICAL ASSISTANCE CASES

SUMMARY OF TECHNICAL ASSISTANCE CASES

1975

Seoul Area

<u>Name of Firm</u>	<u>No. of Visits</u>
Sam-Ho Machine Industries Company	15
Sam-Jin Industrial Co.	5
Daewon Cast Iron Co.	55
Dae-Ga Iron Works Mfg. Co.	2
Mi-Kwang Handbag Mfg. Co.	6
Su-Ryung Metal Bolt Mfg. Co.	2
Chin-Hung Casting Co.	3
Bicycle Manufacturing Federation	2
Kwang-Sung	2
Kwang-Shin Machinery Mfg. Co.	2
Sam-Mi Chemicals Mfg. Co.	2

Taejon Area

Sang Yong Soap Mfg. Co.	6
Daedong Industrial Mfg. Co.	6
Dong Young Industrial Mfg. Co.	5
SinSung Paper Mill Co.	5
Nam-II Machinery Mfg. Co.	6
Kong-Shin Paper Mill	1
Taechang Oil Co.	1
Woo Chun Soap Co.	1
Daeyang Soap Co.	1
Taepyong Yang Paper Mill	1
Nam Sung Mach Machinery Co.	1
Ki-Hung Foundry Co.	9
Donjin Tannery	Not Available
Choongnam Soft Food Co.	Not Available
Yougwon Cosmetics	Not Available
Keumnam Industrial Co.	Not Available
Hanjon Agriculture Chemical Co.	Not Available

CASE NO. 1

MAIN PRODUCT: WOODWORKING MACHINES

Municipality: Seoul

Brief Description of Problem

This producer of woodworking machines has been receiving assistance throughout 1975. Three main problem areas were identified: (1) need for the development of jigs and fixtures for machining and assembling the product, (2) lack of an appropriate plant layout, and (3) need to standardize the manufacturing process of the main product line and improve the quality of this product.

Applied Solution

The SJU team, assisted at times by on-site EDL staff, paid 15 visits to the company during the year. A fixture was designed and developed and is now in use. A scale drawing of the plant was completed and changes in layout were recommended. A formal procedure for receiving and inspecting incoming parts was established. Training sessions for foremen and supervisors were held on the subjects of quality control, plant operation, and others. As a result, the quality has increased, and the company is now ready to supply an export order to Australia.

CASE NO. 2

MAIN PRODUCT: SEWING MACHINES

Municipality: Kyounggi-Do

Brief Description of Problem

Two needs were identified by management of the company: (1) develop a system through which castings purchased from a supplier would be inspected and tested for quality and standard variances and (2) improve technology in processing the surface of the sewing machine body.

Applied Solution

During the year, five visits were made by the SJU technical team to this company. An inspection system was designed and installed by which all castings purchased from suppliers are inspected and random samples are tested at the SJU laboratory. A simple technical solution was developed for the second problem, changes were made in cutting procedures which resulted in a better surface finish.

CASE NO. 3

MAIN PRODUCT: MACHINE CASTINGS

Municipality: Kyounggi-Do

Brief Description of Problem

The technical assistance team identified three basic problem areas: (1) poor quality of the castings, (2) need for a production management system, and (3) desire to expand the market, with the possibility of exporting.

Applied Solution

At the end of Year II, the SJU team reported 55 visits to this industry. It was determined that the inferior quality of the castings was due to poor moulding sand and foundry practices. This was corrected through training and technology transfer to the plant staff. An inspection system was established for both the moulding sand and the cast pieces. As a necessary part of the quality control system, the wood patterns were improved. Unfortunately, the economic depression has limited the possibilities of this company.

CASE NO. 4

MAIN PRODUCT: HAMMER MILLS

Municipality: Seoul

Brief Description of Problem

The management of the company wanted to establish manufacturing methods and prepare machine drawings of the parts they were manufacturing. The product range includes a pulverizer, hammer mill, and drier.

Applied Solution

Two visits were made by the SJU staff in providing the requested technical assistance. The staff has made a set of prototypes of the products, all of which are being tested at the SJU laboratory. Drawings of the parts were also made. Additional theoretical analysis of some of the production items is now under way.

CASE NO. 5

MAIN PRODUCT: HANDBAGS

Municipality: Boochun

Brief Description of Problem

The main problems presented were: (1) no knowledge of the chemical content of the water used in the plating solution, (2) desire to control the thickness of the metal plating, (3) need to accelerate dehydration after plating, and (4) desire to determine true manufacturing costs.

Applied Solution

SJU, assisted by EDL staff members, made a total of six visits to this plant. A sample of the water was taken and a chemical analysis was done at SJU; results were made known to the company with appropriate recommendations. Tests were performed to determine the thickness of the metal plating (both copper and nickel), and again recommendations were made. The dehydration process was reviewed and recommendations made. A simple quality control system also was suggested.

CASE NO. 6

MAIN PRODUCT: METAL FASTENERS

Municipality: Young Dong Po

Brief Description of Problem

The company wishes to enter the export market with its product line of bolts and machine screws. The firm now sells to Mattel Company through an intermediary trading company.

Applied Solution

The joint technical assistance staff paid two visits to this company. While Mr. Diamond (EDL) was in Korea, he examined the export potential of the company product. Recommendations have been made.

CASE NO. 7

MAIN PRODUCT: METAL CASTINGS

Municipality: Kyonggi-Do

Brief Description of Problem

The company requested marketing information and evaluation of the export potential of their "sporting-goods" line of metal castings.

Applied Solution

The SJU team made three visits to the company to research the problem. After discussing the possibilities of exporting these products, it was decided that additional research was needed on the export potential.

The team also recommended that the company start manufacturing cooking utensils, household appliances, and other items.

CASE NO. 8

MAIN PRODUCT: BICYCLES

Municipality: Jongro-Gu

Brief Description of Problem

These manufacturers of bicycles wish to export bicycle parts or bicycles that are produced by a "federation" of manufacturers.

Applied Solution

A joint SJU/EDL team acted on this case and the "federation" was visited twice by the team of experts. The performance and quality of the product are questionable, but no detailed performance tests were made. The problem of exporting parts is being reviewed by Mr. Diamond of EDL, and his report is pending.

CASE NO. 9

MAIN PRODUCT: MICROPHONES OF HEAD-
PHONES

Municipality: Seoul

Brief Description of Problem

The manufacturer is faced with a technical problem related to the "corona-arc" treatment during the manufacturing process. Another problem area is the lack of a standard manufacturing process.

Applied Solution

Two visits were made by the SJU team, assisted by an electronics engineer. The technical problem was beyond the capability of the team and remains unsolved.

The second problem was then reviewed and recommendations were made to improve the manufacturing process.

CASE NO. 10

MAIN PRODUCT: ROLLER BEARINGS

Municipality: Seoul

Brief Description of Problem

This manufacturer of roller bearings had a problem with his carbon hardening process. Once this was improved, he wished to develop jigs and fixtures in order to mass-produce his product.

Applied Solution

After three visits by the SJU technical assistance team, the carbon-hardening problem was resolved by introducing some changes to the carbonization furnace. Jigs and fixtures were designed and are now in use by the manufacturer. Testing of the product also has been introduced and is now being performed.

CASE NO. 11

MAIN PRODUCT: REFINED SALT

Municipality: Seoul

Brief Description of Problem

For some time, the manufacturer has been having problems with his process. Two main problems are: (1) clogging of the conveyor pipe, and (2) low efficiency in the water filtering system.

Applied Solution

Two visits have been made by the technical staff of SJU, but due to the fact that the plant has been closed for a year, they have been unable to determine the magnitude of the first problem.

The problem of the filtering system also has been deferred to a later date when a complete study can be made.

CASE NO. 12

MAIN PRODUCT: SOAP

Municipality: Taejon

Brief Description of Problem

This manufacturer produces inexpensive soap for general use and had been having some problems with his material handling.

Applied Solution

Since this company requested technical assistance, six visits have been made by the SJU team, assisted by on-site EDL personnel. A recommendation was made to replace the conveyor system that feeds the raw material to the production line. This has been implemented and the employment level of the plant has been increased.

CASE NO. 13

MAIN PRODUCT: MATCHES

Municipality: Taejon

Brief Description of Problem

Two areas were identified as problems: (1) cost of production, and (2) productivity.

Applied Solution

The company started receiving technical assistance in mid-March of 1975 and was visited six times by the SJU team. Following their recommendations, management purchased additional manufacturing equipment. Production has increased, and profits also have been higher for the company.

CASE NO. 14

MAIN PRODUCT: BICYCLE PARTS

Municipality: Taejon

Brief Description of Problem

A manufacturer of hand brakes and handles for bicycles had trouble with his handles, which were failing under impact testing.

Applied Solution

The technical team from SJU, assisted by an EDL staff member, made five visits to this plant. Samples of the materials used in the manufacturing process were analyzed at the SJU laboratory, and the results of the tests were made available to the manufacturer. The team made appropriate recommendations to the company management, and these were implemented. The defect rate has been reduced by 5% as a result of the assistance provided.

CASE NO. 15

MAIN PRODUCT: KRAFT PAPER

Municipality: Taejon

Brief Description of Problem

This company requested management technical assistance. This case was reported in 1974.

Applied Solution

Since April 1974, this company has been receiving assistance from the SJU team, with five visits being reported in 1975.

The company continues to maintain profits at the same level as last year in spite of the economic depression and fierce competition.

CASE NO. 16

MAIN PRODUCT: MILLING AND DRILLING
MACHINES

Municipality: Taejon

Brief Description of Problem

Two problem areas were identified by the team of experts: (1) need for standard manufacturing charts and (2) difficulties with the manufacturing process in the areas of tolerance, cutting speeds, depth of cuts, and other items.

Applied Solution

Six visits were paid to this company by the SJU team and on-site EDL staff personnel. Detailed instructions were given to the machine operators as to machine capability, use and abuse. Charts were prepared for several production items. Technical transfers were made in the areas of manufacturing process controls.

CASE NO. 17

MAIN PRODUCT: KRAFT PAPER

Municipality: Taejon

Brief Description of Problem

Management was having problems in the production cost area.

Applied Solution

After only one visit, the SJU team recommended a change in the caustic soda solution which provides management with a 3.75% savings in the cost of caustic soda. Also, the team recommended a simple process by which the company could make its own boiler compound.

CASE NO. 18

MAIN PRODUCT: RICE BRAN JIL

Municipality: Taejon

Brief Description of Problem

Two problems were identified: (1) shortage of raw material (rice bran) and (2) color of final product.

Applied Solution

As a result of one visit by the SJU team, it was recommended to the industrialist that he use other vegetable seeds as raw material. The product could be clarified by using active clay, and this was also recommended. It was further suggested that he prepare animal feed from the oil residues and sell this product.

CASE NO. 19

MAIN PRODUCT: SOAP

Municipality: Taejon

Brief Description of Problem

Desire to clarify final product and establish a system to inspect raw material.

Applied Solution

As a result of one visit by the SJU team, the following recommendations were made: (1) a simple clarification method for the soap, which is made of rice bran oil residues; (2) an inspection system which will control all raw materials entering the plant.

CASE NO. 20

MAIN PRODUCT: SOAP

Municipality: Taejon

Brief Description of Problem

This small manufacturer had a problem similar to the one reported in the previous case. He needed assistance in clarifying the soap being produced.

Applied Solution

The SJU team made a visit to the plant and recommended a simple bleaching process to remove the color from the soap. While there, they also suggested a technique to remove the glycerol after sterilization.

CASE NO. 21

MAIN PRODUCT: TOILET TISSUE

Municipality: Taejon

Brief Description of Problem

The plant, with 31 employees, was having difficulty in producing the desired quality of toilet tissue.

Applied Solution

The SJU team visited the plant and made recommendations to improve the method of breaking down the waste paper being used through the action of caustic soda and calcium hydroxide. This allows for the production of a higher-quality final product. The team also showed the plant owner how to make his own boiler compound out of soda ash, sodium phosphate, tannic acid, and sodium hexameta phosphate.

CASE NO. 22

MAIN PRODUCT: MATCHES

Municipality: Taejon

Brief Description of Problem

Company had a problem with the absorption of moisture by the finished product.

Applied Solution

This is a company with 300 employees. The SJU team made one visit and was able to suggest to the plant owner a method of preventing the matches from becoming moist. Analytical data on the chemicals in use also were provided.

CASE NO. 23

MAIN PRODUCT: MILLING MACHINES

Municipality: Taejon

Brief Description of Problem

The problems identified were the following: (1) manufacturing problem, (2) process control, (3) operation control, and (4) quality control. In all areas, a lack of training also was noted.

Applied Solution

After nine visits by a joint SJU and NCFSI team, the following recommendations were made:

1. Instructions were given as to techniques and procedures of production scheduling, lot sizes, work load balancing, and other matters.
2. Process time was reduced and standard operations were established for main products.
3. A manual is being prepared for standard methods to be used in the future.
4. Instructions were given on quality control and inspection standards.
5. A training program was presented to 25 employees.

CASE NO. 24

MAIN PRODUCT: LEATHER GOODS

Municipality: Taejon

Brief Description of Problem

Continuation. Case presented in 1974.

Applied Solution

Since the recommendations were implemented by management, the plant is operating in a more efficient fashion and the employment has increased 22%, according to recent reports.

CASE NO. 25

MAIN PRODUCT: SOYBEAN CURD AND OIL

Municipality: Taejon

Brief Description of Problem

The traditional method of making soybean curd requires 100% soybean oil. Management wished to know if curd made with defatted soybean oil would be of the same quality as traditional curd.

Applied Solution

The SJU team made a laboratory analysis and determined that soybean curd made from 50% soybean oil and 50% defatted soybean oil was almost identical to the standard product. While doing this, the team also suggested a better method for refining the soybean oil to the plant owner.

CASE NO. 26

MAIN PRODUCT: COSMETICS

Municipality: Taejon

Brief Description of Problem

Company had been closed because it did not meet Ministry of Health standards and regulations.

Applied Solution

The SJU team provided the company with a list of laboratory equipment that is required, as well as testing procedures. Until the company can purchase its own equipment, laboratory testing will be done by the SJU staff at the university laboratories. Company is back in operation.

CASE NO. 27

MAIN PRODUCT: LEATHER JACKETS

Municipality: Taejon

Brief Description of Problem

Two problem areas were in evidence: (1) packaging the finished product and (2) ironing the garments.

Applied Solution

The SJU team suggested the use of silica gel in the packing of the leather jackets to prevent spoilage by moisture. A new ironing system also was recommended.

CASE NO. 28

MAIN PRODUCT: INSECTICIDE

Municipality: Taejon

Brief Description of Problem

Plant manager wished to improve quality control.

Applied Solution

The SJU team took back to the SJU laboratory samples of the product and checked their composition. The team then instructed the staff at the plant on how to test and analyze their product, using the equipment they had available in the plant.