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Republic of Korea.

CASE STUDY ON THE DIFFERENT CATEGORIES
OF TECHNOLOGICAL INFORMATION USERS' NEEDS AND
SECTORAL INFORMATION NEEDS .

Emphasis on the experiences in
the Republic of Korea*

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1. Introduction

As we all understand, the three main elements for socioeconomic development are material, energy and information. We also know that land in the agricultural society, power equipment in the industrialized society and information in the information society play the key roles in the industrial progress in each society. Therefore, needless to say, criteria of value in the future information society will largely depend on information rather than material and energy, on technological information rather than land and power equipment.

Developing countries are experiencing the sufferings stemmed from the transfer, in process of industrialization, to information society, without undergoing complete change into industrial society, from agricultural society. From the viewpoint of information needed in the developing countries, they must receive the information to cope with the information society prior to the utilization of information required for industrialization, that is, the harmonized utilization of the necessary information for industrialized and information society. This precondition makes it difficult for developing countries to evaluate and select the value of information they need. It is, however inevitable that developing countries need all kinds of information including technological information in process of advancement into industrialized and information society. So, they should, positively and systematically, plan and act to cope with the dual society.

Most developing countries would have the investment program for socioeconomic development. The investment program is executed by Government or Government Agencies, R&D institutes, private enterprises and development financing institutes, and so on. Development projects such as the investment of public utilities by the government or its agencies, R&D investment by the R&D institute, enterprises' investment and start-up investment by the development financing institutes need all kinds of technological information for the evaluation and selection of each development project. Especially, the more productive the development projects are, the greater the role of technological information.

But there exists the lack of the recognition of technological information and the appropriate management of them. Hence, the developing countries still waste scanty resources due to the unreasonable management of technological information.

Accordingly, it presents such problems that government, enterprises and the individual of the developing countries should have a new concept and strategy on technological information.

In connexion with these, this report deals with the Korean experiences in the field of technological information by the different categories of users' needs and sectoral needs of industry.

II. Technological information of different categories of users' needs

1. Case Study

A. Government

- 1) The information on the appropriateness of proposed facilities' scale.
 - a) the prospect of the present and future demand-supply
 - b) generally-known economic scale
 - c) the scale of homogeneous or analogous projects
(Review on the international competitiveness of the scale)
 - d) the scale and time of the future expansion of facilities
- 2) The information on the appropriateness of the technology selected to construct or manage the project in question and on the security of the technological and technical manpower.
 - a) The kind and the content of technology
 - b) The owner of technology in question and the problems concerning the procurement and the utilization of it
 - c) Comparison with the existing technology having been selected by the analogous projects

B. Public R&D Institute

- 1) Information on the national policy Technology promotion effect degree of the technology accumulation

technology-spreading effect (ripple effect)

2) Information on
R&D project

Capability of R&D

security of personnel
willingness of development
organizing power (Teamwork)

Marketability
of commodity

prospect of international
market

prospect of domestic market

marketing capability

ease or

Ability to secure
research resources

difficulty of the import of
of technical materials

ease or di-

fficulty of technology import

self-financing ability

Probability of
the results of R&D

prospect of industrial
environments

stability of enterprise

growth of enterprise

	GNP effect	degree of contribution to GNP degree of productivity enhancement
	Effect of foreign exchange saving	export increase import substitution
3) information on technology	Newness of technology	originality new business advancement
	Economic value of technology	value added comparative advantage over the existing technology
	Marketability of technology	correlation with the trend of the technology development qualitative competitiveness price competitiveness
	Feasibility of development	ease or difficulty technology restrictiveness of development timeliness of development

C. Enterprise

In this section present all sorts of necessary information for Korean enterprises. Detailed cases will be mentioned in chapter III.

The necessary information for enterprise consist of information concerning over all management and technology management, production management personnel management, marketing and so on.

1) The information concerning over all management

- a) Information concerning domestic
- b) " " international situation
- c) " " general economic situation
- d) " " management strategy
- e) " " management of other firms
- f) " " credit condition of the concerned firm
and that of other firms.

2) The information concerning R&D

- a) Information, concerning invention, patent and know-how
- b) " " R&D of the other firms
- c) " " R&D of commodities

3) Information concerning production

- a) " " production materials
- b) " " production technology
- c) " " production facilities
- d) " " production efficiency

4) Information concerning sales

- a) Sales information (the head office, branch offices, agencies, and retail stores)
- b) The information concerning sales forecast
- c) " " a claim
- d) " " planning of special sales
- e) " " sales status of other firms
- f) " " consumers, monitors, and market investigation

5) Information concerning broadcasting & advertisement

- a) Information concerning newspaper, T.V. and Radio advertisement
- b) " " advertisement paper
- c) " " magazine advertisement
- d) " " show and exhibition
- e) " " catalogue

6) Information concerning accounting

- a) information concerning transaction law

- b) Information concerning transaction price
- c) " " relation of profit and loss
- d) " " financing and stocks
- e) " " budget and execution
- f) " " account auditing

7) Information on labor management

- a) " on wages
- b) " on recruitment
- c) " on labour market situation
- d) " on the safety of labor
- e) " on promotion
- f) " on performance and the investigation on
personal affairs
- g) " on career management and the problem: investigation
of workers
- h) " on measures for welfare and welfare facilities
- i) " on labour union
- j) " on personnel affairs of other firms

8) Information concerning education and training

- a) " " " in a firm
- b) " " seminars, lectures and symposiums
- c) " " facilities and materials for education and
training

- d) informations concerning books literature of education and training
- e) " " faculty examination qualification
- f) " " teachers lecturers and consultants
- g) " " results of education and training
- h) " " studying abroad

9) The information concerning investigation by a special command

10) The information concerning information defense

11) The information concerning information materials and technique

D. Development financing institute

1) Technological investigation

a) characteristics of technology

i) theoretical background

ii) risk of technology

iii) comparison with the existing technology

- developmental situation and the reason of failure

- existence and/or nonexistence of substituted technology and possibility of the appearance of it.

- analysis of the trend of homogeneous technology development

- comparative advantage over existing technology

iv) accordance with the orientation of government policy

v) probability of the application of developed technology to production

technology

vi) opinion of specialists

vii) characteristics of product

(The type of large scale firms and the type of small scale firms)

viii) reasonableness of planning schedule

b) The capability of execution

- i) the capability of technical manpower
- ii) level of R&D facilities
- iii) the cooperation with other institutes

c) Planning commercialization

- i) analysis of the content of technology import contracts
- ii) analysis of production process
- iii) review of facility scale
- iv) review of location
- v) review of ease or difficulty of the procurement of raw materials
- vi) ability to secure man power
- vii) ability to secure social overhead resources

d) Regulations related to production

E. Engineering Consulting Company

1) General

- a) Project Requirements
- b) Existing Resources
- c) Training Program
- d) Regulatory and Licensing

2) Quality Assurance

3) System Planning

- a) System Analysis
- b) Alternative Study

4) Materials Balancing

5) Site Identification

6) Cash flow Forecast

7) Cost Comparison among Alternatives

2. Overall Review of the case study

Government aims to increase the effectiveness of the national economy through investments in large scale projects or the projects in which the private sector can not participate due to market failure. Accordingly, it is necessary for government to collect the information concerning present and future market and economic scale and the information necessary for increasing the present and future technology level. Social and cultural informations and information concerning the national and social welfare are necessary for government.

Through the information for measuring the technological and economic effectiveness of necessary technology and by measuring these effectiveness the public R&D institutes have the means select the indispensable technology or decide the order of priority. There is information on measuring of technology accumulation and the spreading effect of the technology for measuring the technological effectiveness, and information concerning production effect and foreign exchange saving effect for measuring the effectiveness of national economy. The necessary technical information for the public R&D institutes consist of newness, economic value, product value and development possibility which are the key technological information. Another necessary information for the public R&D institutes is those concerning commercialization of technology. The role of the public R&D

institutes for industry is now increasing, and so the information to commercialize the technology is one of the most important areas of information of R&D institutes. These are information concerning development capability of the technology, marketability of the product after R&D, supply of R&D resources, and commercialization capability of R&D results in the end.

The necessary information for enterprise is comprehensive and varies from the information on concrete administration such as technology, production, sales and personnel affairs to the information on general management.

But as for the required information for a specific company, it is important to select the most valuable information from among those information. What is more important is the information for practical use concerning the overall business management.

The key information required for development financing institutes are those concerning project evaluation. This information is composed of information on the technology itself, those on the method of technological development and industrialization, those on the complement capability, and those on the commercialization schedule. This information is necessary for the development financing institutes to study project feasibility and is collected from the project proposals of the R&D institutes and enterprises.

Engineering consulting is the synthetic and complicated crystal of some software technologies and a system approach is needed for that. The required synthetic information in this field is as follows.

- 1) Preliminary feasibility study for investment and the information for the preparation of detailed project proposal
- 2) Information for plant design and engineering of the machinery and tools
- 3) Technical ~~information~~ information on the manufacturing process and plant operations
- 4) Technical information on the administration and maintenance of facilities.

III. Technological Information for sectoral needs of industry

I. Case study

A. Agriculture/Food Industry

(A) O.F. Co., Ltd.

Project : Development of food additives with domestic agricultural products

1) Technical Information

A) Information on general technical aspects

- a) Information on the recent foreign living standard trend on dietary life
 - Trend of simplification, rationalization, and maximization of efficiency
 - The scientification trend of general living standards
- b) Information on the irrational factors in domestic dietary life
 - The adhesion to the traditional dietary life
 - The lack of understanding for the dietary life
- c) Information on the recognition for the improvement of the dietary life
 - Influences of investment technical development of agricultural field on the other ones
 - Recognition of the requirement for dietary life improvement aimed for the internationalization
 - Recognition of the requirement for the high-protein-good for the national health and physical-standards improvement
- d) Information on the development trend of food industry
 - Development of the new technology and products are carrying out actively centering around seasoning, convenience food, beverages and processing meat food

- R&D on the processing technology of the agricultural products and livestock food
- R&D for the cosmic food prepared for the future cosmic era
- R&D for the alkaline food for the improvement of national habitudes

B) Information on the improvement of the manufacturing process

- Unification & systematization of the process product development activities
- Expansion of the existing research institute facility as well as its staff
- Establishment of the food research institute for the propulsion of the R&D activities

C) Information on the additives for the natural food

a) Fruit jams

- Demand for bread, as a substitutive meal, increases due to change of the domestic dietary life pattern
- sharp increasing demand for jams in parallel with that of bread
- However, only low grade jam-products are produced by a few domestic companies, while high-grade ones are depended mostly upon imports
- Especially, marmalade is imported entirely due to the inferior processing technique of the domestic food companies

Moreover, the existing domestic jam-companies require up-to-date technologies for the higher quality products with natural colors, free of artificial ingredients and long storing period

b) Applied oil products

- Vegetable oil products, such as vegetable cheese, coffee flavorings, as compared with animal oil products are free of cholesterol, a major causing **substance** of circulatory diseases, maintaining flavor and taste of dairy ones while its price is cheaper than that of dairy products.

2) Other Information

A) Market information

- a) Owing to remarkable progress in living standards, the proportion of fruitage consumption for household shows ever increasing trend in recent years
- b) Especially, the grain consumption, the traditional chief meal, decreases, while that of fruitage increases gradually
- c) Processed fruitage consumption increases rapidly. For example, the demand for canned **tangerines oranges**, bottled jams, and fresh fruits show sharp increasing trend
- d) The increase of flour consumption as a rice substitutes **contributes** to promotion of the natural food additives consumption inevitably

B) Expected Effects

- a) Value addition of domestic agricultural products
- b) Imports substitution through localization of higher-quality food additives
- c) Technical influences of processing and oil-refining agricultural product to the related industries
- d) Enlargement of employment

(B) D.Y. CO., LTD.

Project : Export of marine products canning plant

1) Technical Information

A) Information on the Republic of Korea's canned goods industries

- a) Enjoyed booming exports of canned pine mushroom and canned oyster in 1970s.
- b) Met recession at overseas markets from the beginning of 1980s.
- c) Canned goods have not been widely enjoyed in the country so far.
- d) Most of formerly installed soldering-type canning m/c are idling because of increasing welding type canning m/c in the Republic of Korea.

B) Information on the export prospects of marine products canning plant.

- a) Soldering-type canning process is more suitable than welding-type canning process to developing countries due to such merits as low production cost, high productivity and easy handling
- b) Manufacturing process of canned "mackerel" is simple for developing countries to commercialize without any serious technological difficulties.
- c) Idling soldering-type canning m/c and its embodied technologies can be transferred to developing countries as well as some skilled labours.

2) Other information

A) Market

- There is no canning plant in Fiji and canned mackerels are imported from Japan.

- Canned mackerel industry in Fiji is expected to be competitive due to low labor costs and low general expenses
- some taxational benefits by Fijian Government
 - . Income tax exemption for 5 years
 - . Duty exemption of imported canning m/c for initial commercialization
 - . Prohibition or raise of duty rate for imported canned mackerel

B) Expectation.

- Export inducing effects (tin plate and others)
- Acceleration of other plant's export

(C) N.S. CO., LTD.

Project : Construction of the test plant for the development of freeze-dry technology & products

1) Technical information

A) Information on the freeze-dry process

- a) Raw materials
- b) Pre-treatment (Cutting, Crusing, Cooking & Cleaning)
- c) Pre-freezing
- d) Drying (Initial vacuuming, Circulation of freezing media, Partial heating & Ventilation)
- e) After-treatment (Humidity control, weighing)
- f) Packing (Damp proof)
- g) Storing

B) Information on the merits of freeze-drying

- a) Superiorities to the existing natural and/or heat drying
(Less deterioration of shape, color, flavour, and nutritious elements)
- b) Better restorability by wetting
- c) Excellent drying efficiency

C) Information on the domestic food industries

- a) There are two freeze-dry m/c in domestic food industries
- b) Freeze dry technology is adopted only in the manufacturing of powdered products so far
- c) Development of application methods of freeze-dry technology seemed to be urgent for the domestic food industries to keep pace with the advance of food processing technologies

D) Characteristics of proposed products

- a) Proper pre-treatment
- b) Accurate control of drying process
- c) Good packing
- d) Long preservation of freshness
- e) Stable procurements of raw materials

E) Technological abilities of the applicant

- a) Performed feasibility study for the proposed projects for more than 2 years
- b) Technological assistance for the test operation by the Japanese plant supplier
- c) Technology transfer from Asahi Food Co., Ltd. of Japan
 - Proper operation
 - Quality control
 - Manufacturing of proto type

2) Other information

A) Technological expectation

- a) Quality improvement of existing instant foods
- b) Development of raw instant foods for leisure & sports
- c) Quality improvement of combat rations

B. Electronics/Electrical

(A) T.S. CO., LTD.

Project : The improvement of process for the enhancement of productivity and the development and commercialization of industrial AVR (Automatic Voltage Regulator)

1) Technical information

A) General technical informations concerning AVR

- a) Domestic AVRs are used mainly in industrial sectors, they become the major reason for distribution losses as the economic development has required the rapid increase of electricity consumption
- b) The development of industrial AVRs has constantly been required in forecasting that the utilization of equipments with AVR will sharply increase in accordance with computerization of industrial equipments
- c) The large number of domestic AVRs with excellent response time, utilizes SCRs that show much waveform distortion rate and are expensive.

B) Technical characteristics of planned product

- a) Planned product choose method that ~~was~~ recently used in Japan and has low efficiency but excellent response time (within 0.2 sec) and it is possible to sell it at 1/2-1/3 price of existing product.
 - b) The method is used mainly in industrial equipments that require the stability at power resources rather than power saving.
 - c) The method is able to partly solve the problems of existing domestic AVR's with SCR's of similar response time, such as wave-form distortion and cost push factor by filter design.
- C) Information concerning the process of domestic manufacturing firms.
- a) As the increase of industrial demand makes manufacturing firms mix the process for "Small quantity and various products" and that for "Mass-production and customer's production", efficient production and quality control has faced difficulties.
 - b) Because the order of special TRANS production for the customer's manufacturing of some special standardized products, entails the high unit price of order manufacturing and the long period of delivery, the internal assembly TRANS is required but the shortage of equipments and factory scale make it difficult to produce TRANS efficiently.
- D) Information for the **improvement** of process
- a) The enlargement of production and the improvement of quality control in order to meet demand increase in the future.
 - b) The requirement of large scale factories for the purpose of saving cost.
 - c) The requirement of the new purchase of equipments for manufacturing some TRANS internally and additional process, such as WINDING M/C and vacuum implanter.

- d) The **requirement** of the development and selling of industrial AVR to fulfill the consumer's taste.

2) Other information.

A) Market informations

- a) The demand group that needs industrial AVRs is **not the household but financing institutions, government and public offices, medical institutions and factories** which possess computers, medical instruments, measuring apparatus and soon.
- b) The possibility of selling in market depends on the reliance on products, because they are produced mainly by means of OEM(Original Equipment Manufacturing) rather than by means of direct selling in market.
- c) If planned AVRs don't have the same price range as existing hand-operated AVRs, it is difficult to sell them in market because of the lack of consumer's understanding on them. **AVRs that can be marketed without difficulties are those that are used exclusively in high-quality electrical housewares and small-volume equipments.**

B) Expected effects

- a) Effect of energy saving
- b) Effect to protect electric machinery
- c) Strengthening of promising export industry

(B) K.M. Research Corp.

Project : The development of high-quality mould for semiconductor industry.

1) Technical information

A) General information concerning mould industry for semiconductor manufacture

- a) Mould for semiconductor manufacture consists of the assembly of parts ranging from 10 to 1,000 according to those sorts
- b) Parts market holds the 40 percent of domestic semiconductor mold market.
- c) The number of domestic firms which specialize in this sector is about 10. And the parts of mold that they produce are made of mild steel but are cheap. Because of the cheap price they are used in spare parts
- d) Considering the trend that domestic mold market is moving to market for super-hard materials, it is forecasted that the demand for very hard mold parts will gradually increase.

B) Technocal information concerning precision mould for semiconductor industry

a) Mould

- The main products that hold the 50 percent of overall mold demand-moulds that are used in plastic moulding operation in process of IC manufacture.
- Because in precision, product longevity and stic products are interior to import, domestic consumers have imports- oriented inclination.

b) Transfer and Forming die

- The mold is used to slice and bend IC wafer Domestic semiconductor industry utilizes hard moulds yet but is expected to increasingly utilize very hard materials.
- It is forecasted that regular domestic demand will appear in one year.

c) Stamping die

- The mold is used to manufacture Lead Frames and domestic semiconductor firms have imported all Lead Frames.
- As Samsung Precision Corp. and Tongyang Chemical Corp. invest in Lead Frame manufacturing sector, it is expected that market demand will sharply increase.

C) Technical information for developing high-quality precision mould for semiconductor industry

- a) Technology to manufacture and assemble mold for producing high-quality IC. especially machinery lapping technology and special surface treatment technology.
- b) Technology to manufacture "roller bending type die" -up-to-date structure among T/F dies.

2) Other information

A) Market information

- a) Despite the slump of domestic business, semiconductor industry keeps a constant growth.
- b) Also in manufacturing pattern, the existing stage of assembly is moving into the stage of manufacturing and the localization of major raw materials such as "Lead Frame", "Silicon Water" and so on is propelled.

- c) Manufactures show their strong intent to produce high quality products such as 64 KDRAM, 256KDRAM, Super mine-TR and so on.
- d) In accordance with the above trend the demand oncrease over 20 percent of mould is expected.

B) Expected effets

- a) **Accumulation** of the technology to manufacture precision mould
- b) Import subsitution and export
- c) Establishment of the base of domestic semiconductor industry.

C. Machinery/Material Industry

(A) W.C Special Metal & Material Co., Ltd.

Project : General instruction of Tungston Carbide

1) Technical Information

A) Information on Sintered Tungston Carbide(CTC)

- a) Tungsten is an important constituent in a wide variety of superalloy and nonferrous alloys with its excellent properties such as **light hardness**, wear resistance and good thermal and electrical conductivity
- b) The sintered tungsten carbide(CTC) which is produced from virgin powder is cemented, usually with the aid of nickel and cobalt(binder), to form various cutting tools; tool bits in metal cutting and grinding, tool inserts in rock drilling or mining and general wear parts for machinery.
- c) Domestic CTC producers cannot help depending on foreign **countries** for the supply of CTC alloy constituent-Ni, Co, Ti and Ta etc. Therefore its producing cost is very high. Moreover, products of inferior quality or wearing down have been scrapped or exported to foreign countries at low price because any recycling technology is **unavailable**.

B) Information on Recycling technology of CTC scrap

- a) In foreign countries, most tungsten-bearing scrap is home generated and recycled by the tungsten producers of mill, steel and tungsten carbide products.
- b) There are three technologies of CTC Scrap : those are chemical treatment method, scrap milling method and zinc processing in vacuum furnace. But they have been kept secret by U.S.A., W, Gekmang and Japan who have the know-how of recycling.

c) Zinc Process

- Zinc process has been developed by Mr. Kwon-Young jin, Rep. of Korea scientist working in the U.S.A. He had served at Teledyne Wah Chang Albany Co. as a process engineering manager. That company is a world famous tungsten powder producer.
- Zinc process Heating pieces of CTC scrap blended with Zn in a graphite crucible at 1,500°C, the binder, Ni and Co. is dissolved from CTC and then segregated CTC scrap is reduced to powder without separation of the constituent
- This process is less vulnerable to pollution and impurity than other process and its operating cost is less expensive than that of others.

C) Information on applicant's Technical Capability

- a) With the technical aid of Mr. Kwon, the applicant completed the research, the development of lower cost recycling process for high purity CTC powder. This activity was implemented as the National project '83 supported by Gov't in cooperation with Korea Institute of Energy and Resources(KIER)
- b) The applicant plans to get the technical aids from Mr. Kwon and KIER continuously.

2) Other information

A) Information on Market prospects

- a) Domestic industries consume CTC about 350t per year (in case of Japan 4,000t) with the annual increasing rate of above 15% and 60% of it has been scrapped or discarded and the rest has been exported at low price

- b) The manufacturing cost of CTC is around ₹40,000/Kg but through the recycling process it is expected that the cost is saved by 50%.

B) Others

- a) It is expected that the manufacturing cost of sintered tungsten carbide tools is lowered.
- b) This process will be much contributive to relevant material industries ; the refining of Ti, Ta and Zr. etc.

(B) U.S. Manufacturing Co., Ltd.

Project : The transfer of aluminium zinc alloy coated sheet and strip
technical information

1) Technical Information

A) General technical aspects on alloy coating

- a) The technology at hot dip **galvanized** and aluminized coating has been remarkably developed
- b) The coatings themselves have remained the same with little change in small alloying additions to improve the mechanical properties of the coatings.
- c) aluminium-zinc alloy coating is internationally patented.

B) Technical information on aluminium-zinc alloy coating

- a) Aluminium-zinc alloy coating is composed of 55% aluminium about 1.6% silicon, and the balance zinc by weight.
- b) A main induction-heated refractory lined pot for dipping and assistant pot for feeding molten aluminium and zinc are installed instead of the iron pot used in making galvanized sheet.
- c) Complicated cooling system is used to produce optimum corrosion resistance of the coating.
- d) Other processing conditions are generally similar to those of galvanized.
- e) Lower production cost than that of galvanized use to lower cost of the coating metal and **additional** area per tonnage.
- f) After solidification : the spangles are smaller and more uniform in size than in **galvanized** and generally the structure within each spangle is more regular.

g) Characteristics of aluminium-zinc alloy coatings.

- excellent corrosion resistance
- good high-temperature resistance
- good heat reflectivity
- good formability/weldability
- cut edge protection characteristic

h) Usage

- metal buildings
- electric/heating equipment transportation facilities
- agricultural applications
- culvert pipe
- solar heating panels and miscellaneous

C) Information on the applicant's technical capability

- a) The continuous technical development and expansion of production facilities during past two decades since its establishment
- b) The introduction of BIEC (Bethlehem International Engineering Corporation) 's know-how and technical informations on coating method together with facilities and equipment for the manufacture and use of the proposed products.
- c) The technical training of its engineers and technical consultatic from BIEC.

2) Other information

A) Market information.

- a) The applicant has led the thin steel sheet's market domestically with the share of 52%
- b) In 1982 the applicant's total sales amounted to 260 billion Won, of which zinc coated steel sheet occupied 25%
- c) The production cost of galvalum sheet will be reduced by 10% or more due to lower coating metal costs

B) Expected effects

- a) cost reduction
- b) export increase

D. Chemistry/ Chemical industry

(A) S.S. Chemical Ind. Co., Ltd.

Project : Improvement of Heat Shrinkage Oriented Polypropylene (S-IOPP)
Film Manufacturing Process

1) Technical Information

A) General information on heat shrinkage P.P film

- a) S-IOPP film is manufactured by inflation biaxially orientation method. In **comparison** with the conventional biaxially oriented PP film manufactured by tenter method, S-IOPP film has uniform heat-shrinkability in both mechanical direction and transverse direction and needs less investment costs and manufacturing costs.
- b) The main raw material of S-IOPP, a kind of special polypropylene random copolymers, is entirely imported from few foreign companies like Atto Chemi of France, Hercules of U.S.A., Chisso Corp. of Japan, etc.
- c) S-IOPP film is used for wrapping instant noodles, batteries, toys, albums, cosmetics, etc..

B) Information on process improvement method

- a) Polymer blending method :
Blending domestic PP homopolymer with imported PP random copolymer at the ratio of two to eight
- b) Optimization of extruder screw design under the assistance of Chisso Engineering Co. of Japan(CEC)
- c) Revision and localization of annealing equipment

C) Information on technical collaboration with CEC

CEC is said to want the company to join in CEC's exporting S-IOPP manufacturing equipment to South-East Asia in the way of dispatching the company's start-up team together with localized equipment such as annealing equipment, take-up winder, etc.

D) Information on domestic P.P producers

Domestic PP producers, Honam Petrochemical Corp. and Korea Petrochemical Ind. Ltd., are reported to be capable of revising their existing PP plant to produce special PP random copolymers with know-how acquired by the time when domestic demand reaches the level of economic capacity.

2) Other Information

A) Information on domestic market

a) S-IOPP film is a import-restricted item

In the case of importing S-IOPP film, importers should acquire **recommendation** of Korea Plastics Industry Coporated Organization (Exact survey on domestic demand is possible)

b) Fast increase is expected in line with increase of convenient food like **instantnoodles**

c) Large-sized companies, participation in this field is impossible because S-IOPP film manufacturing is designated as the specilized field for small & medium sized companies according to related law

d) Price competition

- sales price : 2.1 - 2.4 mil won/ton

- imported price : 2.8 mil won/ton

B) Expected Effects

a) Import substitution

b) Cost reduction

(B) S.W Ind. Co., Ltd.

Project : Development of Plastics Antioxidant Containing Hindered Phenol Group

1) Technical Information.

A) General information on plastics antioxidant

a) Information on function

Various plastic antioxidants are added to many polymeric materials in small quantities to have processing protective effect against thermo-oxidative degradation during polymer manufacturing/processing and against yellowing on exposure to light during service life period. Antioxidants have a function to control chain propagation reaction and peroxide decomposition reaction which result in polymer degradation.

b) General required factor of antioxidant

- Non-toxicity
- Stable at processing temperature
- Not affect the processability of polymer
- Good in melt-blending with polymer
- No occurrence of chemical reaction with other additives
- small density difference between antioxidant and polymer
- Good in dry-mixing with polymer powder and pellet

c) Information on type

- Primary antioxidant (having function to control chain propagation reaction)
 - . mono-phenol group
 - . bis-phenol group
 - . polymeric phenol group
- Secondary antioxidant(having function to control peroxide decomposition reaction)
 - . phosphoric group
 - . thio group

B) Information on the proposed product

- a) Equivalent to Irganox 1010 and Irganox 1076 of Ciba Geigy Ltd. in Switzerland
- b) Excellent synergistic effect when incorporated with secondary antioxidants
- c) Optimum quantity is added according to applications
- d) Good mixability with other additives such as plasticizers, stabilizers, antistatic agents, flame retardants, blowing agents, coloring matters, slip agents, etc.
- e) Irganox 1010 equivalent is superior to Irganox 1076 equivalent in heat-resistance and recycling
- f) Manufacturing process is developed by the company's own technology

C) Information on technological capability

- a) Developed more than 200 kind of fine chemicals like PVC stabilizers (powder, liquid), high polymer flocculants, organo-tin agrochemicals, polyurethanes, special paints, phosphoric group antioxidants, etc. in its R&D Center
- b) Proved to have good quality according to sample test results of conventional polymer producers such as KPCC (LDPE), Lucky(PS, ABS, PVE), HPC(PP, HDPE), KPIC (PP, HDPE)..

2) Other Information

A) Information on market

- a) Proposed products . have . imported entirely from Ciba Geigy Ltd.
- b) Domestic demand is expected to increase at rate of more than 10% in line with increase of conventional polymer production

Expected sales amount in 1986 (export : 1,100 thousand US\$, domestic ;
1,800 million won)

B) Expected Effects

- a) Import substitution
- b) Technology accumulation in fine chemical industry

III. Overall Review of the case study

The necessary information in Agriculture/Food industry is that concerning the recent foreign or domestic living standard trends on dietary life, concerning the recognition for the improvement of dietary life, concerning the development trend of food industry, concerning the effect analysis of foods to the national health and physical standards improvement, concerning the species improvement for heavy harvest, and above all those concerning the nation's dietary life. The information on the food production process, research activities for product development, and the technical capacity of connected industries is necessary. In developing countries gravity of the first degree industries is still so high that the required information for the development of agricultural/stock-raising products and processed agricultural products is extremely important.

The electric and electronic industry is the vanguard industry pouring out up-to-date products so that it needs fresher and more revolutionary information rather than unfashionable ones. So, it is significant to collect information about the technical level and the technical capacity of the domestic or foreign industries and develop more excellent goods, and much more important, to grasp the information on the life scale and the life time of the goods and to prevent the goods in stock from being ascribed unreasonable investment. Especially the information on the diode-producing industry is more important than anything else as it determines the fate of modern electric and electronic industry.

The information on the machine and the metal industry is indispensable for fostering the key industries of modern industry. The information on the production technology of machinery and parts and production technology of metal and alloy, that on the improvement of the manufacturing process etc. are important.

The information on the technical level and the manufacturing process of domestic or foreign allied firms is also important.

The recent continuous development of new polymer materials and fine chemicals based on high technology has made it impossible for the existing companies to prosper without the strengthening R&D capacity. In polymer industry, for example, technical information to develop photosensitive polymers, electroconductive plastics, liquid retaining polymers, and composite materials such as aramide fiber and reinforcing materials is needed.

In fine chemical industry, technical aid is required to develop photochemicals and agrochemicals. Currently genetic engineering is growing up very rapidly. Sponsored by government & private companies interested in biotechnology. Basic research is going on successfully but information on the mainstream technology for mass production of hepatitis B vaccine, medical diagnostic reagent and hormones is still difficult to obtain.

IV. Conclusion

1. Information Mind (Information + Mind)

The Term 'Information Mind' was coined by Mr. Katakawa in the Information Development Association of Japan combining "Information" and "Mind".

It has become a popular phrase as Japan has experienced a rapid change to information **society**.

By the way, there is no definition for "Information Mind" in the dictionary. But, from the concepts that many information management specialists have supplied, we can define that the above phrase means "proper recognition of the significance of information and information management and the senses that can create information". Considering recent days, flooded by the information without the Information Mind it becomes possible to search **for something specific and do it rapidly**. Information is monopolistic in its characteristics and without an initiative the necessity and the importance of Information Mind decreases. So, we should think and feel the importance of Information Mind before others do.

Information Mind also means a consistent goal-oriented spirit. Essentially the concept of the necessity of information comes from the competition principle and is a relative concept.

Information Mind comes into effect when we are willing to fight vigorously and have victorious-oriented spirits. Therefore information, can bear fruit when we have the will to create information, the strong goal-oriented spirit, and the mind to keep information important. That is why the importance of Information Mind is emphasized.

Information Mind doesn't mean real investment and physical effort. It is a matter of spirit and a matter of will. Therefore the company whose members have Information Mind will have a powerful information potential and can get through competition to victory.

2. **Fostering Specialist**

Generally special information needs reliability on the information itself and a knowledge of the special subject of that field. **In the case of the person who engages in the field of technology,** it makes no difference whether he has the ability or the knowledge. But, it creates a problem in case of the person who manages an organization above medium scale. In order to cultivate high-level personnel we may train the student who majors in the science of **information, the student who specializes in a specific subject, or a field,** but it is dangerous to train only one of them. It is ideal to utilize both of them and assimilate each as they mature.

3. **Internationalization of information collection**

The situation and problems of Korean intelligence activities in the U.S. must cope with the internationalization of information collection as follows :

- 1) We have poor investment in education for the purpose of efficient information activities. For concrete example the shortage of information specialists caused by poor investment in information, education and foreign language experts show the **deficiency** of top-managers to understand and pay attention to the important information activities.
- 2) We should use the up-to-date telecommunication equipment (computer, telex, international telephone and etc) and must intensively invest in overseas business travel. By this we may secure the rapidity and the accuracy of tele-communication and mutual information exchange.
- 3) We should synthesize and analyze the information in detail under the company's special information department and relay

it to the top-managers as soon as possible by eliminating the complexity of report procedure stemming from okav. systematic information structure we may actualize intelligence activities as a key function in an organization.

- 4) The preliminary plan on intelligence activities is not carried out systematically and the activities of the information agent of overseas branches are poor because of the feebleness of the overseas branch in the U.S.
- 5) By making the assistance system of the government more active, namely by making lively the activities of the Republic of Korea's Embassy in the U.S.A. in the fields of commerce and economy, we may give efficient assistance to the Republic of Korea's firms. For example by keeping and supplying sufficient data on the financial structure and the credit condition of the U.S. corporations we may help the country's firms extend their business into the American market.