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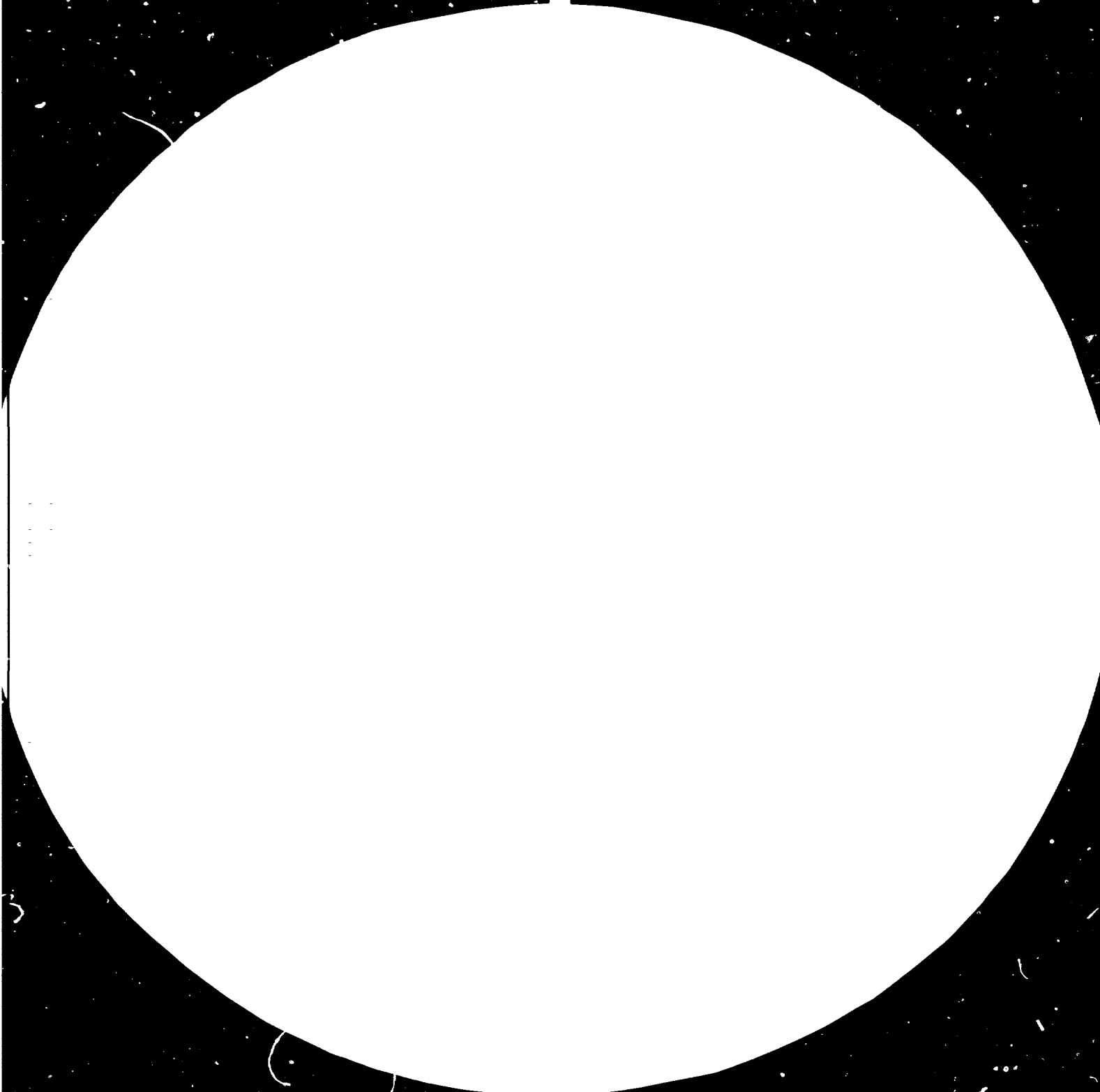

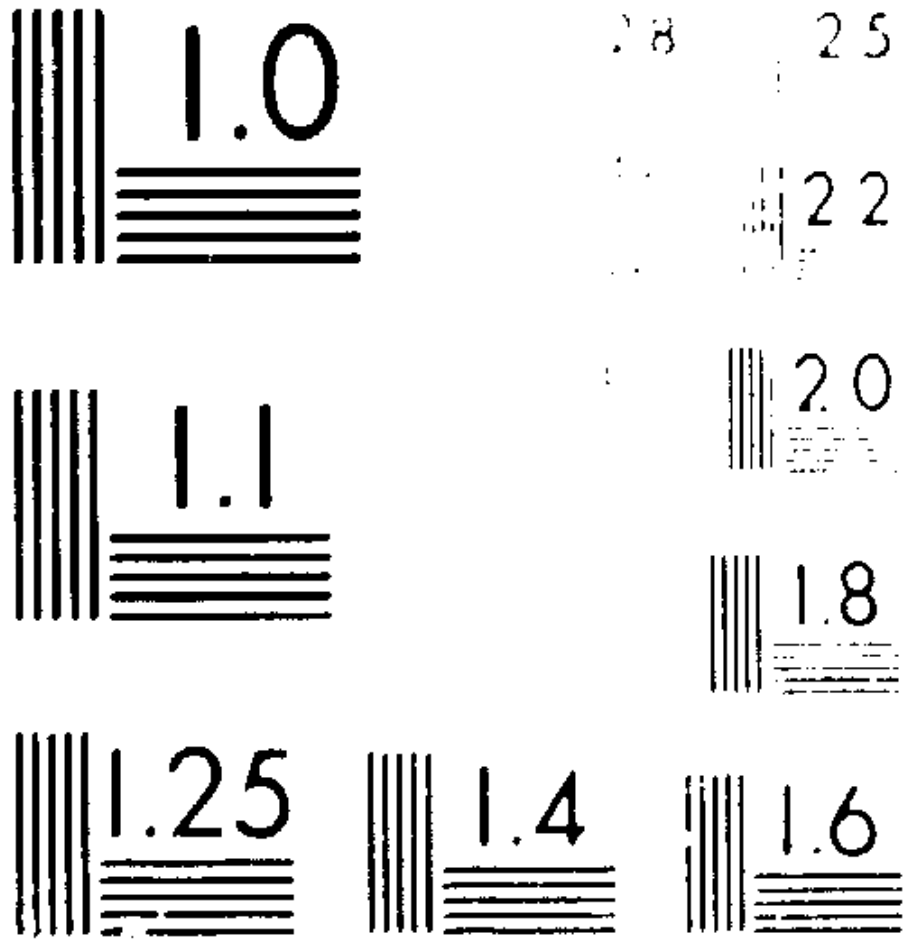
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Expert Group Meeting for Exchange of
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Delivery System (TSDS)

Manila, Philippines, 2 - 6 November 1981

AN EGYPTIAN TECHNOLOGY SERVICES DELIVERY SYSTEM (TSDS) EXPERIENCE *

by

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INTRODUCTION

The Expert Group Meeting for Exchange of Experiences on Technology Services Delivery System TSDS is a unique opportunity to present an Egyptian experience and also to observe the experience of the Philippines and other participating countries.

The Aide Memoire presented to the meeting recognises the fact that small and medium industries (SMI) have an important role to play in industrial development and Egypt is no exception to this statement.

SMI plays an important role in the countries development especially after President Sadat introduced his "Open Door Policy"* which opened up the country and encouraged foreign investment Private small and medium industry has benefited from this policy.

The sad events of the 6 October 1981 which ended President Sadat's Presidency, however revealed the continuing policy of President Hosny Mubarek and this important industry sector is expected to flourish and develop in the future.

The problem of the provision of technical and technological services is also evident in Egypt as it is all over the developing world and EIDDC** had been one of the first institutions established to provide technical services to industry.

At first, these services were directed towards the predominantly larger state industry, but as this paper will show a mechanism was found to channel EIDDC's services to the smaller size group of manufacturers.

This experience was not known as is used in this Group Meeting (Technology Services Delivery System) TSDS, but in its present form seems to be working in a very similar manner.

The mechanism presented in this paper systematically provides technical assistance (design, product development), technological assistance (engineering, plant layout) technological services and training of a Technology Resource Institute (EIDDC with its divisions) to SMI through a SMI technical assistance programme. The resources of other institutions as universitites, specialised centres, etc. are also tunnelled through EIDDC in case of need.

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*The ammouncement of the "Open Door Policy" was made in 1973 and relies basically on law 43 encouraging foreign and private investment.

** The Engineering and Industrial Design Development Centre. An autonomous Centre of the Ministry of Industry and Mineral Wealth established with UNIDO assistance in 1968.

1.0: — SMI AND TECHNICAL ASSISTANCE, RECENT STUDIES

A very words are necessary to introduce the reader to Small and Medium Industry in Egypt though a detailed presentation would be superfelous at this stage.

1.1. World Bank Survey

One of the first in depth studies of this sector was the World Bank's Survey* in 1977. The report not only surveyed the sector, but spelled out a comprehensive technical assistance programme for the country. A number of institutions were to become the nucleus of this technical assistance programme including EIDDC and the Productivity and Vocational Training Department PVDT of the Ministry of Industry and Mineral Wealth.

1.2. ILO/UNDP Employment Strategy Mission

ILO took also an active look at the technical assistance aspects within the ILO/UNDP employment strategy mission in 1980. The mission commissioned a study ** on the Small Industrial Sector to highlight again the technical assistance aspect. The study has again influenced and emphasized the need for this assistance.

2.0. A TECHNOLOGY RESOURCE INSTITUTE (EIDDC)

In order to present the Technology Resource Institute, it is necessary to present some basic data on the institution in question.

2.1. Development

Phase I of the EIDDC project had its main purpose to train designers in product development. Phase II of the EIDDC's project had as its main objectives: to develop industrial product design capabilities, to assist in development of tools manufacturing capacities and above all to assist in the development of capabilities for manufacture of processing or capital goods equipment.

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* Arab Republic of Egypt, Survey of Small Scale Industry. Report No. 1818-EGT, Dec. 2, 1977.

** Small Industrial Sector Opportunities, Problems and Technical Assistance, by Dr. Yusef K. Mazhar, 1980.

In phase I, concentration was mainly on the engineering industries; in phase II, the work has. expanded to other types of industries. The work of EIDDC followed the main objectices although there were large demands for complementary activities in the field of industrial consultancy. The work plan of the project document has been continuously adjusted to be as close as possible to the changes in the Egyptian industry, and the growing demands. To fulfill the requirements and the main objectives, some new activities had been introduced: Plant layout studies, heat treatment and material tests. specialized short-term training courses, lectures as well as technical documentation and information. Also, from time to time, some requirements from other developing countries in the form of specific assignments or training activities were accepted. The system of nominal payment for the work done by EIDDC was introduced and is working satisfactorily. Presently, EIDDC has the following technical divisions and can be considered an integrated Technology Resource Institute (TRI):

2.2. Main Divisions

1. Industrial Design Section
2. Product Design and Development Division
3. Processing (or capital goods) Equipment Design Divison
4. Engineering (or Production Technology and Tool Design)
5. Process Design Division
6. Workshop Division (manufacture of prototypes, special tools, mechanical, electrical, welding, carpentry work)
7. Heat Treatment and Materials Test Division
8. Training Division (40 courses annually)
9. Documentation and Information Division (library and information)
10. Small Scale Industry Division (including World Bank/DIB program)

Every division is working in the field of its specialization. The Training Division has the task of organizing all training activities already technically prepared and conducted by the specialized divisions*

---

* Training courses (regular programme) are given in
  Annex 1 Engineers
  Annex 2 Supervisors and Technicians

3.0. SMALL AND MEDIUM INDUSTRY (SMI)

3.1. The Institute for Small Scale Industries (ISSI)

The Institute for Small Scale Industries (ISSI) at Giza, a Cairo suberb, which has been attached to EIDDC was also a a joint project between the Government of A.E. of Egypt and UNDP, executed by the International Labour Office (ILO). The ISSI's project started in 1963 and second phase in 1966. The ILO project was terminated by the end of 1969. The institute was practically innactive when taken over by EIDDC.

3.2. Objectives

Phase I and Phase II of the project of the Institute for Small Scale Industry had as their main objectives to render services in the field of applied technical and economical research, development and implementation of industrial techniques, industrial consultation and management as well as training and extension work. Concentration was on the small scale industries and the Government, cooperatives and private sector. But, since termination of UNDP, ILO assistance, the activity of the previous ISSI had concentrated on very limited training in the form of various training courses, mainly conducted for foremen, workers and draftsmen. Therefore, the Government Authorities have considered the better utilization of the previous investments and accordingly had decided to attach the ISSI to the EIDDC. Presently, the previous ISSI is working as a part of EIDDC having certain technical divisions and the management located at its premisses.

4.0. WHAT TECHNOLOGY FOR SMI?

4.1. Technology for the People and Small Industry

EIDDC has endeavoured to meet the technological demands of SMI and a paper* presented to the Technology for the People Fair in Geneva spelled out some of the successful products designed and developed for small and medium industry.
Even though the Centre might at the outset appear to have been mainly industry oriented over the years, the main activity has been towards designing and developing more and better products for the SMI. Egypt has the advantage of having a large (42 million) local market. The market is also in a way homogeneous and is character ised by a large low to medium income bracket.

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* The Role of EIDDC in Egypt (Product Design and Product Commercializing) paper by Dr. Yusef K. Mazhar. Technology for the People Fair, 16-20 Sept. 1980, Geneva.

4.2. Appropriate Technology

This imposes a policy of developing products of appropriate technology, acceptable cost and usefullness. Western sophisticated products are often higer priced, complicated and expensive, and cannot be easily manufactured by smaller enterprises because of the complicated machinery and large investments needed.

Such a situation provided a unique opportunity for EIDDC to design and develop products which met directly the needs of the masses.

These products could be briefly summarized as follows:

4.3. Technology and Local Design

a) In the household consumer products area:

The Centre had started by designing small products as electric irons, but followed up by designing and developing a range of simple low cost electric washing machines. These machines were immediately accepted by small industry and the public. Now more than 20 such producers are active in Egypt.

The technology of design varies from one model to another, with side impellers, double impellers, bottom impellers and simple timers. Production technology varies from alluminium, to stainless steel, to figerglass tubs. Electric water heaters formed anothe_ group of items. Now Baby washers, washing and rinsing machines are also being produced. Town gas heaters are now also requested after new areas introduced town gas.

b) In the agricultural area:

A number of successful designs produced mobile thrashers with electric and diesel drives which had proven their worth. Small trailors were also developed with tonnage up to 4 tons. These are drawn by tractors. Irrigation pumps were first on EIDDC's priorities and the Centres designs have been produced in industry. Sprayers for fruit spraying were also useful products.

c) Solar Energy Equipment:

Here again the Centre was in the lead. The first solar heaters were developed more than seven years ago. Now small local producers have a number of models on the market. Designs were developed for 50, 100, 300 and 500 liters capacities. The first village with solar heaters started operation last year. Next on the priority list are vegetable dehydrators. In upper Egypt vegetables are dehydrated on roof tops and the solar dehydrator will soon be in every village.

d) Building Material Equipment:

Concrete mixers and brick making machines are essential for small builders. Both have been designed and built. Small builders use these machines effectively and give small contractors a chance to contribute to meet the needs of new housing.

e) Small Machine Tools:

The first of the small machine tools was a woodworking lathe. Developed so it could be manufactured in small shops to be sold to woodworking and furniture small industry. Such small simple machine tools as well as lathes and drills are essential items for small workshops.

5.0. DOES SMI REALISE ITS NEED FOR TSDS

An important question which has often been put to EIDDC is whether SMI realises its need for a Technology Services Delivery System, and if so, what is the priority? A recent regional programme* undertaken in Alexandria showed the following**

5.1. Problems of SSI

In general, small and medium scale enterprise problems could be summarised as follows (as presented by the 50 participants of the seminar.

a) General lack of manpower, due to the fact that thousands of Egyptian skilled workers are working in Arab countries;

b) Low skills and increasing wages of remaining manpower, high turnover of labour;

c) Inconsistancy of import regulations and constant changes in importation laws, causing fluctuations of prices of most raw materials;

d) Meeting market demand with present production capacities. (The market could almost absorb everything that was produced).

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* EIDDC/DIB (Development Industrial Bank)/ILO Programme

** Report on the Small Scale Industry Development Programme. Alexandria August 1981, prepared by Dr. Yusef K. Mazhar (EIDDC Ducment).

Most industrialists seemed anxious to obtain ready trained manpower, but were somewhat reluctant to invest in training and developing any new manpower fearing that as soon as the workers are trained, they will seek other better paid jobs.

This short seminar held after distribution of the certificates to participants of an EIDDC training course showed however that all participants wanted EIDDC personnel to visit their manufacturing facilities and discuss ways for better production and facilities (new technologies).

5.2. Observations

As a result of the Alexandria visits, the following observations can be made:

a) Small and medium industry development is promising. Development is perhaps rather haphazard, but progress is impressive.

b) SMI (private) has different problems compared to the public sector and these problems are not always easily recognizable.

c) The sector is not always at first understandable of what the SSI technical assistance programme can do for them, but react quickly and positively once common ground for assistance is found.

d) Most production is without proper design, in fact often according to samples not designs. Drawings are nearly always lacking and the expertise is thus in the minds and hands of the enterpreneur and his workers. A risky situation.

e) Quality levels are very fluctuating. Some companies have high standards of quality, usually ensured by the owner and not by any quality system. Other small factories produce defective and inferior quality products. The acceptability of the market is the reason why manufacturers can sell inferior quality low technology products. Special effort is required in this area if the consumer is to be protected.

f) Extension of present production facilities are rarely properly planned. Only architectural drawings are made. Sometimes the owner undertakes his own building design and execution to save money.
Extensions are vertical, horizontal and in all directions - wherever there is place. No thought is given to proper layouting and most enterpreneurs believe that outside consulting engineering assistance is unnecessary.

g) Material handling is almost unknown, and manual handling is almost uniquely used. Congestion is common in most enterprises with bad storage facilities.

h) Product development is based on copying and simplifying imported goods. Local products thus developed are usually inferior, mainly because of limited tooling facilities. A butan gas oven manufacturer produced simultaneously an acceptable quality higher priced oven but also produced a bad , but very well sold, cheaper model, produced by primitive moulds and dies.
Punches used large automobile springs for ejection. Owners can accept development if EIDDC can show the way and provide some success stories. SSI is mostly willing to accept technology, but a practical approach is needed showing results.

6.0. FUTURE PROJECTS

A number of projects with outside financing are now in the pipeline. The Development Industrial Bank (DIB) will again receive a World Bank Loan primarily aimed at the private SMI sector, of this an estimated 1 million US$ will be put aside for an elaborate technical assistance programme to be executed by EIDDC.

Another UNDP financed project has also been prepared with an allotted 500.000 US$ and will give technical, technological and management assistance to small and medium industries. The main thrust of this project will be in the different governorates. EIDDC has also been made responsible for this project.

Bilateral aid is also expected from a number of countries, but Egyptian Government input is necessary for local funding as it is obvious that the projects cannot pay for themselves as most SSI delivery or extension systems are heavily subsidized.

These projects will consolidate the present project which is gradually covering more enterprises. A simple recording system has been developed TAP/SSI/EIDDC. Annexes 1-6 show the workings of the system which is still manual.

An HP 6845 computer has just been purchased and it is intended to use some of its capacity for data storage.

ANNEX I

TRAINING COURSE PROGRAMME FOR ENGINEERS

- Heat Treatment & Material Testing
- Feasibility Studies and Planning of Industrial Projects
- Compound & Progressive Press Tools
- Die Castings Moulds
- Industrial Engineering
- Factory Planning and Layout Techniques
- Systems and Equipment for Material Handling
- Industrial Design
- Hydraulic and Pneumatic Control Systems
- Organization and Management of Maintenance Systems
- Value Engineering
- Production Processes Techniques.

ANNEX II

COURSE FOR SUPERVISORS AND TECHNICIANS

1. How to read Mechanical drawings
2. Inspection and Quality Control
3. Mechanical Workshop Management
4. Welding Technology
5. Welding Technology
6. Maintenance Technology
7. Operating and Maintening
   Carpentry Machinery and Equipment
8. Fits and Tolerance
9. Jigs and Fixtures
10. Finishing of Furniture
11. Practical Heat Treatment for Factory
12. Injection Moulds
13. Die Manufacturing
14. Upgrading Dies & Tools
    Draftsmen Skill
15. Advanced Milling Techniques
16. Upgrading Mechanical
    Draftsmen's Skills

ANNEX III

TAP-SSI/EIDDC CAIRO		Ref. No.
Date:		Page out of Pages

Address:

Type of Enterprise:

Date of starting Business:

Capital invested in the beginning:

No. of Employees:

Profit Situation:

Sales Value (per year):

DIB Client:

Assets (Machinery):

Remarks:

ANNEX IV

TAP-SSI/EIDDC Cairo		Ref. No.
Date:		Page out of Pages

OBSERVATIONS

Description	Information not available	Rating lowest → highest
Management competence poor - good	☐	☐ ☐ ☐ ☐ ☐
Product development and design neglected - well considered	☐	☐ ☐ ☐ ☐ ☐
Production program neglected - well considered	☐	☐ ☐ ☐ ☐ ☐
Flow of work (lay-out) badly - well organized	☐	☐ ☐ ☐ ☐ ☐
Equipment poor - advanced	☐	☐ ☐ ☐ ☐ ☐
poorly - well maintained	☐	☐ ☐ ☐ ☐ ☐
poorly - well used	☐	☐ ☐ ☐ ☐ ☐
Quality of products poor - above average	☐	☐ ☐ ☐ ☐ ☐
Marketing poorly - well considered	☐	☐ ☐ ☐ ☐ ☐
Staff poorly - well trained	☐	☐ ☐ ☐ ☐ ☐
poorly - well guided	☐	☐ ☐ ☐ ☐ ☐
low - high turnover (fluctuation)	☐	☐ ☐ ☐ ☐ ☐
Size of production area very small - spacious	☐	☐ ☐ ☐ ☐ ☐
Accounting system	☐	☐ used ☐ not used
Cost accounting	☐	☐ applied ☐ not applied

Remarks:

TAP-SSI/EIDDC CAIRO		Ref. No.
Date:		Page out of pages

REQUESTS

Assistance is asked in the fields of:

1. Obtaining licence . . . . . ☐
2. Obtaining loan . . . . . ☐
3. Starting an enterprise . . . . . ☐
4. Marketing . . . . . ☐
5. Organization . . . . . ☐
6. Personnel management . . . . . ☐
7. Calculating of manufacturing costs . . . . . ☐
8. Product development and design . . . . . ☐
9. Improving lay - out . . . . . ☐
10. Procurement of machines and materials . . . . . ☐
11. Manufacture of a new product . . . . . ☐
12. Improving production process methods . . . . . ☐
13. Making of appropriate production equipment . . . ☐
14. Tool and die design and making . . . . . ☐
15. Heat treatment . . . . . ☐
16. Using EIDDC's machines . . . . . ☐
17. Training of staff within the factory . . . . . ☐
18. Training entrepreneurs . . . . . ☐
19. Training by attending EIDDC's regular courses . . ☐

ANNEX VI

TAP-SSI/EIDDC CAIRO		Ref. No.
Date:.		Page out of pages

ASSISTANCES PROVIDED

A. Through counselling by SSI department on the following subjects:

1. Obtaining licence . . . . . ☐
2. Obtaining loan . . . . . ☐
3. Starting an enterprise . . . . . ☐
4. Marketing . . . . . ☐
5. Organization . . . . . ☐
6. Personnel management . . . . . ☐
7. Calculating of manufacturing costs . . . . . ☐
8. Product development and design . . . . . ☐
9. Improving lay - out . . . . . ☐
10. Procurement of machines and materials . . . . . ☐
11. Manufacture of a new product . . . . . ☐
12. Improving production process methods . . . . . ☐
13. Making of appropriate production equipment . . . ☐
14. Tool and die design and making . . . . . ☐
15. Heat treatment . . . . . ☐
16. Training . . . . . ☐

B. Through the following departments of EIDDC:

1. Training . . . . . ☐
2. Product design . . . . . ☐
3. Industrial design . . . . . ☐
4. Tool and die design . . . . . ☐
5. Capital equipment design . . . . . ☐
6. Factory lay - out . . . . . ☐
7. Toolroom . . . . . ☐
8. Mechanical workshop . . . . . ☐
9. Heat treatment workshop . . . . . ☐