OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

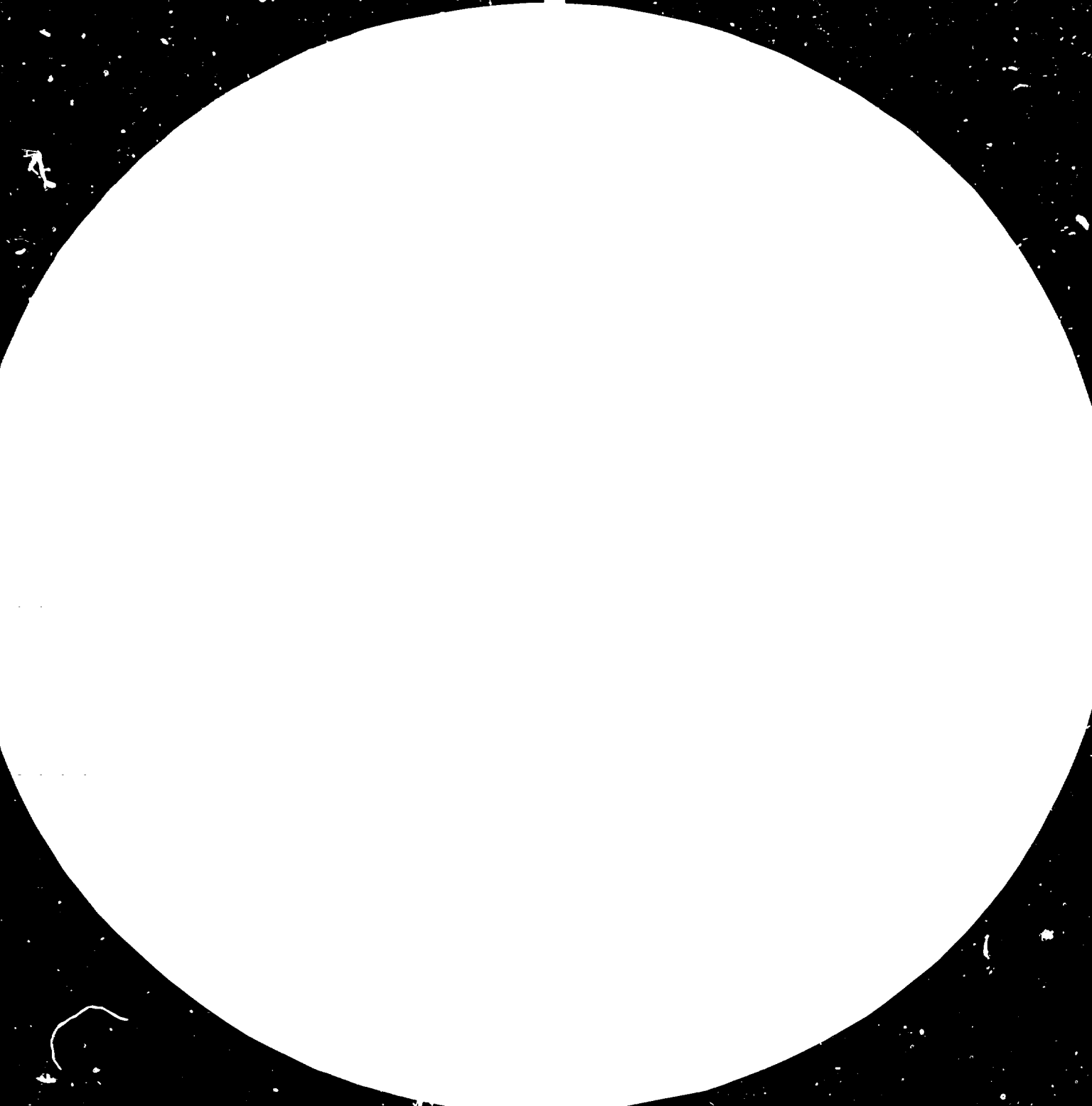
FAIR USE POLICY

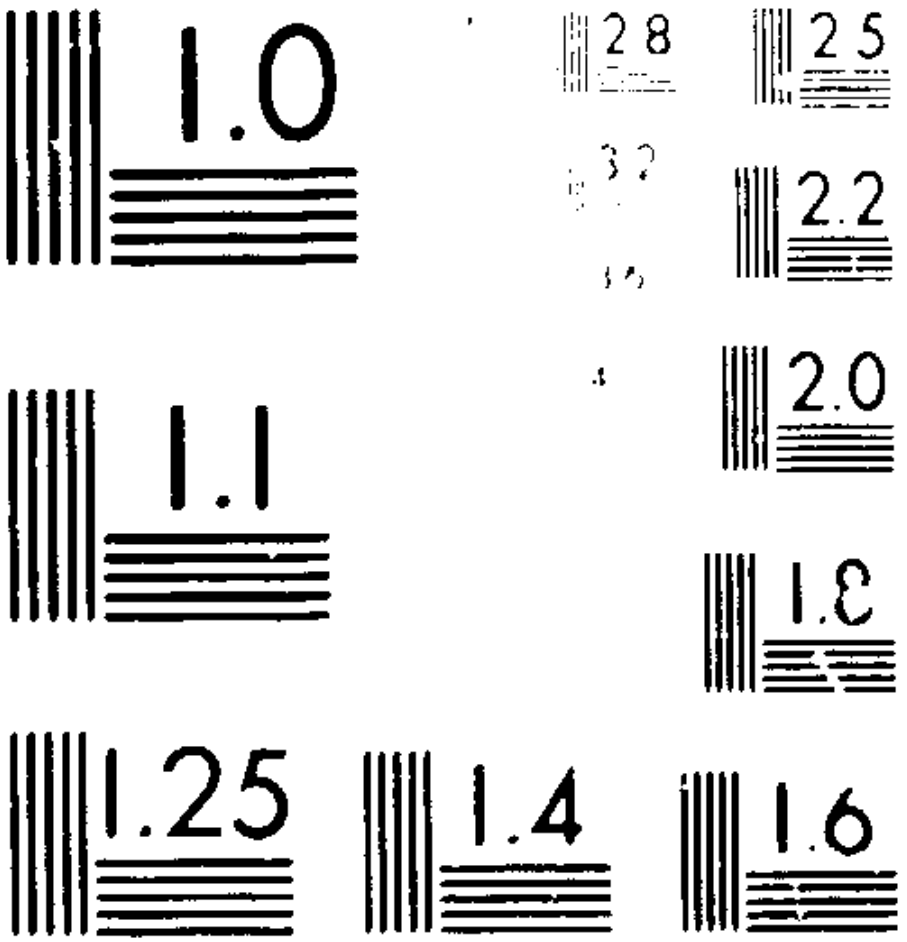
CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org




1.0
2.8
2.5
3.2
2.2
2.0
1.1
1.8
1.25
1.4
1.6

11273

Distr.
LIMITED

ID/WG.339/4
22 April 1981

ENGLISH

United Nations Industrial Development Organization

Workshop on Selection of Technology for
Assembly of Electronic and Electrical
Products in Developing Countries

Utrecht, Netherlands, 4 - 8 May 1981

WORKSHOP METHODOLOGY AND OUTLINE OF CASE STUDY *

by

F.R. Bradbury **

and

P.H. Pijs***

2583

* The views expressed in this paper are those of the authors and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

** Professor, University of Stirling, Scotland.

*** Philips' Pilot Plant, Utrecht.

V.81-24390

OUTLINE

The proposal forms part of a pre-feasibility study related to the possible establishment of a television assembly plant in an industrializing country.

Aim.

To form a framework for assembling the experience and knowledge of the participants of the workshop in connection with the formulation of guidelines for technology choice and to direct the discussions along these channels, a specific proposal is offered for discussion.

The workshop will deal with the electronic assembly industry with a special focus on technology choice and it was decided to choose as an example the possible establishment of a television assembly plant in a developing country.

The proposal to be presented to participants contains two alternative approaches, i.e. one using "current" technology and the other a "simplified" technology.
These terms are defined at the conclusion of this outline.

The proposal is presented to serve as a vehicle for discussions and it must be emphasized that the object of the workshop is not to conduct a commercial negotiation leading to a "best" buy.
It is for this reason that the proposal tabled is not a fully detailed quotation but contains some of the options available for technological choice. Sufficient detail is included to give point and specificity to the questions raised and to assist participants to contribute their knowledge and experience to the planned manual of guidance.

Various aspects of the theme of the workshop are incorporated in the proposal and it is the intention that the results of the deliberations will serve as an input to formulation of guidelines to be offered to any

parties from developing countries who may be having to select technology to meet their countries' and enterpreneurs' needs.

It is especially important that attention is paid to the possibilities and limitations of the alternative technologies offered, and the demands they will make on receiving country infrastructures. Apart from the practical data set out in the proposal the supplier company will illustrate both alternative approaches and the participants will also be able to see both systems operating in practice. Additionally a film will be shown which compares and illustrates the two technologies, current and simplified. The "simplified" technology can be seen in the Pilot Plant at Utrecht, where we will be guests during the workshop. The "current" technology, in the form of a highly automated production plant, is at the Eindhoven headquarters of Philips and will be visited during the workshop.

The choice between the simplified and current technological approaches influences not only the equipment (hardware) but also the overall organization (software) and the humanware (training programs).
These aspects will be illustrated by examining in more detail three important features of the production process: materials handling, quality control and maintenance.

Contents.

The proposal contains the following information:

- Market situation and a 4-year production plan.
- Product specification.
- Proposals for both "simplified" and "current" technology approaches together with relevant data on investments for a complete plant by both approaches.
- Masterplan (network planning) for the establishment of the TV plant, indicating leadtime of equipment and components to be delivered, training periods, local assistance, etc.
- Information on the costprice (ex factory) related to series of production volumes and to the technology chosen ("simplified" or "current").

- A flow chart of the assembly process and a brief description of the operations involved.
- Data on vertical integration in relation to local value-added.
- A draft agreement.
- An outline training program.

The proposal is worked out in a descriptive visual way in order to allow the participants to familiarize themselves quickly with the case. Data are provided in such a way that although they give room for discussion, they do not require time to be spent on detailed calculations.

Alternative approaches.

a. "Current" technology.

By this expression we indicate the up-to-date state of the art of manufacture of TV sets. This will be seen operating at Eindhoven and will also be illustrated by a film to be shown during the workshop.
Current technology is in a continuing state of change to improve quality and productivity and it incorporates world-wide advances in technology in order to remain competitive in world market.
Current technology is especially suited to high-volume, low-cost production but it must be remembered that although a such technology may be expected to give a high-quality standardised product, there is some loss of flexibility as compared with the "simplified" technology described below.

b. Simplified technology.

The object of simplification is to reduce the investment needed for current technology and is achieved by replacing much of the automated processing and instrumentation by manual operations and control. This means that simplified technology is less risky financially than current technology and therefore easier to introduce. Moreover, simplification leads to easier maintenance and is thus less demanding on special skills of people employed. On the other hand because, it is less tightly controlled by instrumentation, "simplified" technology needs very tight to quality control in order to keep the product up to specification.

An advantage of "simplified" technology is that it offers greater scope for indigenisation of parts of the manufacturing process. "Simplified" technology has economic advantages at low volume production. Some examples of the different approaches of the "simplified" compared with the "current" technology to various aspects of the manufacturing processes will be looked at in more detail during the workshop.

Mechanism.

Participants in the workshop will be assigned to four different groups in order to stimulate a dynamic process of interchange and role-playing.

I The supplier group.

Members of the supplier group should be seen as representing various types of suppliers offering alternative approaches to TV assembly technology.

II Working groups.

These will be made up from participants of the developing countries and organized as far as possible to represent the whole gamut of markets and infrastructure prevailing in the various contries. They will meet and interact with the supplier group to study the proposal and the problems that it raises concerning technology choice faced under developing country conditions.

III The "boss" group.

This group will roleplay the executive decision making function of the receiving company for entrepreneur. It will interact with the working groups, discussing with them their ideas at each stage of the deliberations with the supplier group.

IV The advisory group.

This group will represent public sector functions (UN, home government, local authority, etc.) involved or associated with the establishment of new industries in developing countries.

The working groups (II) will meet with the supplier group (I) in a number of sessions, during which they should try to explore the significance of the technologies offered for their own national contexts and to identify the problems associated with installation of production facilities such as those decribed in the proposal. The working groups (II) will also have access to the "advisers" (IV) with whom they can discuss some of the broader aspects of technology selection - such as its interaction with the economic and social plans of governments and the role of the United Nations various bodies. The role of the "boss" group (III) is to "keep the pressure on" to assist the working groups to resolve the problem as presented by this proposal and to express their conclusions in a way which can contribute usefully to the compilation of the manual guidance, which is the main purpose of the workshop.