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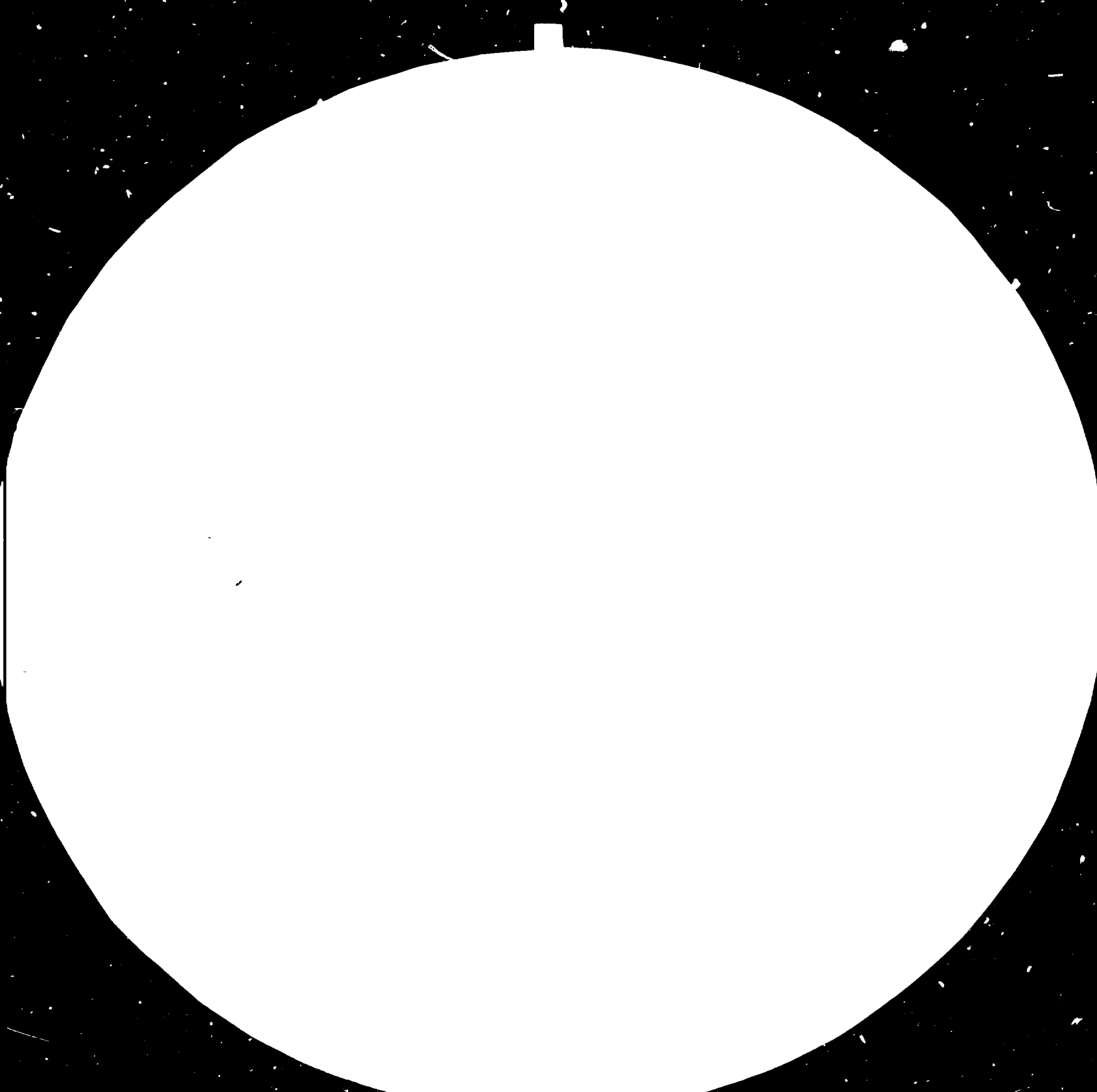

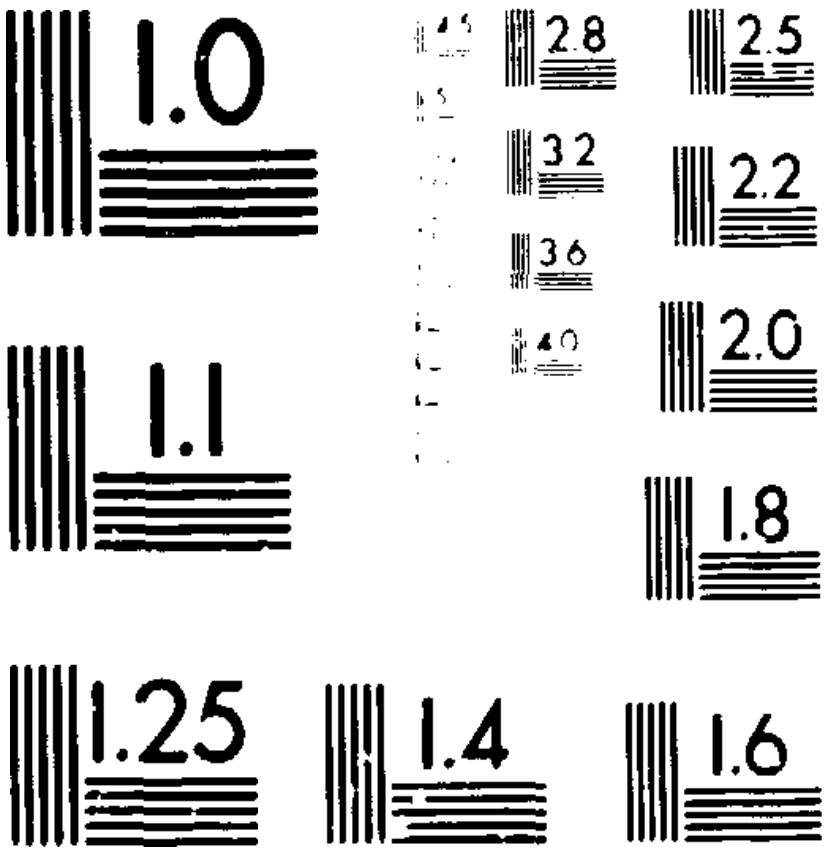

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MANUAL ON THE ESTABLISHMENT OF REGISTRY INFORMATION SYSTEMS.*

Some Considerations

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Introduction

1. Developing countries have become more and more active in the establishment of registries for the analysis and control of technology transfer contracts. Today, over 40 developing countries have already established technology transfer registries or are considering the possibility of setting one up. This attitude towards technology flow generally pursues three main objectives:

- to reduce direct and indirect costs due to technology imports;

- to increase the bargaining power of domestic companies when negotiating technology transfer agreements;

- to promote an effective absorption and assimilation of imported technology, thereby supporting the development of domestic scientific and technological capabilities.

2. Emphasis has been mainly on the evaluation of legal, technical and economic tasks. The storage, collection and analysis of information has, as a rule been relatively neglected, at least in the registries I know better. The burden of daily work has generally inhibited an adequate organization of information flow and the structuring of information departments. People in the registries are aware of these shortcomings but usually through lack of time, resources or experience in the organization of efficient information systems they are unable to rectify them. Knowledge of previous decisions and of usual terms and conditions enforced is normally held by the technicians themselves, and given the high turnover of such personnel in most registries, this knowledge is lost when the relevant person leaves. The moderately

effective participation in the TIES system is basically also a consequence of the lack of adequate information systems. Therefore the idea of a manual on registry information systems would seem to be a very positive step in the right direction. It will certainly be a useful tool for assisting registries in solving their information problems and in establishing or reorganizing their information units. However, the manual should not be a substitute for specific expert missions.

3. Furthermore, the issuing of such a manual and the exchange of views it will certainly engender additional advantages as it can be used as:

- a background for the further development of TIES, incorporating (hypothetically) the TIES coding manual; and as

- a background for future information expert missions to developing countries.

4. Needless to say, the manual should be carefully prepared. The temptation to provide ready-made solutions should be avoided. In my opinion, the manual must be envisaged as an awareness-creating document. Accordingly, it should:

(a) identify the main problems/issues faced by technology transfer registries in the information area (due account being given to the insertion of technology transfer regulatory activities into the overall organizational structure);

(b) convincingly show the importance of information for the correct evaluation of technology transfer agreements;

(c) provide empirical information on the solution chosen by selected registries in solving specific questions;

(d) broadly present the main aspects of technology transfer information systems and the articulation between information inputs and outputs;

(e) discuss the questions and challenges raised by information handling systems and provide guidelines for their implementation;

(f) provide a framework for an international exchange of technology through TIES or regional systems such as SAIT and RITLA.

With these aspects in mind, the main concerns of this paper are:

- to identify questions/issues to be dealt with in the manual;

- to present ideas for the co-ordinated, logical and useful development of each chapter and of the manual as a whole.

I. Objectives of the manual

5. The manual should be intended as UNIDO's contribution towards the strengthening of the activities of technology transfer registries through a better organization of their information systems and should represent the outcome of UNIDO's experience in assisting national registries both in their establishment and in the expansion of their activities. The organization of registry information systems so as to fully profit from the opportunities and additional data offered by international co-operation under TIES will also be dealt with.

6. Specifically, the main objectives of the manual may be considered to be the following:

(a) to assist the newly established registries in implementing basic information systems;

(b) to assist existing registries in the reorganization, upgrading and extension of their information systems, namely on what concerns:

- co-ordination between evaluation and information flows

- restructuring of current activities

- extension of activities (monitoring, supply of information to companies, etc.)

- computerization;

(c) to enable countries to fully participate in the exchange of information under TIES and regional networks (and to reap the benefits therefrom);

(d) to define the role of the information system in the functioning of technology transfer registries;

(e) to assist registries in the establishment of information systems capable of ensuring the provision of data on technology transfer to relevant national bodies.

II. Objectives and general characteristics of registry information systems

7. Objectives

(a) Assistance in contract evaluation (this is usually the basic objective of registry information systems, since most of the work performed is concerned with contract evaluation).

(b) Assistance in contract monitoring.

(c) Provide information support in decision and policy-making, either at the registry or at higher levels.

(d) Assistance in registry performance evaluation.

(e) Supply of data to other national organizations in order to improve the terms and conditions of technology imports and/or the orientation of research.

(f) Participate in international (TIES) or regional (e.g. SAIT) systems of information on technology transfer.

8. Functions

The main functions performed by registry information systems arising from the above objectives are:

(a) Collection, analysis, storage and diffusion of basic data on technology transfer agreements needed for evaluation or monitoring purposes.

(b) Follow the flow of agreements, from their submission to their registration.

(c) Collection and analysis of statistical information on technology transfer.

(d) Elaboration of studies on the trends and characteristics of technology inflow.

(e) Provision of periodical information on the trends of technology inflow and on registry performance.

(f) Provision of data on technology transfer agreements to other national bodies (government organizations, research centres, companies, etc.).

(g) Collection and supply of data to international or regional information exchange systems on technology transfer.

9. Obviously the functions of the information system will depend on the objectives and organization of the national registry itself and on its stage of development.

10. Characteristics

More specifically, the characteristics of the information systems and their organization will depend on various factors, relating both to the structure of the registry itself and to the overall socio-economic features and level of development of the country concerned.

11. The most relevant factors to be taken into account include, inter-alia, the following:

(a) Integration of technology transfer in the overall activities of the registry.

In many countries registries are not exclusively concerned with technology transfer as they perform other functions such as analyses of direct foriegn investment projects, authorization of overall investment, etc. Technology transfer information systems have, therefore, in some instances to take into consideration the overall information needs of the organizations; instead of being perceived as a negative feature, they can be extremely positive if adequate information flows and relative powers of the various fields are established.

(b) Overall objectives of the registry on technology transfer area.

The activities of the ID unit (or its focus) will depend on the objectives of the registry. For instance, whether the registry is mainly concerned with the control of contracts or with promoting the awareness of domestic firms on the negotiation of technology transfer agreements and supporting them.

(c) Type of contracts

Although licensing agreements were subject to scrutiny in virtually all registries, the same does not happen with service agreements. The information requirements for analysis of these are not the same for licensing contracts. Similarly, turnkey agreements involve several peculiarities that should be taken into account when designing information systems.

(d) Type of companies importing technology

Evaluation and information needs are different when technology imports are carried out exclusively (or mainly) by private enterprises or by state-owned ones. Those countries where intra-group technology agreements (that is between companies within the same multinational concern) are prohibited will not have the same information needs as those where intro-group contracts are permitted and carefully scrutinized.

(e) Yearly contract load

The yearly average number of contracts submitted to the registry is another factor which could influence the characteristics and organization of the information system and its implementation.

III. Implementation of the basic information system

12. Relevance of information for contract evaluation

(a) Knowledge of previous cases is crucial to base evaluation decisions. Therefore a system of providing evaluation staff with data on accepted terms and conditions for similar technologies is needed.

(b) In many cases the prevailing standards used by registries when evaluating contracts stem from previous experience; an adequate storage of previous decisions would be particularly helpful for existing evaluations and for explaining registry decisions to the firms concerned.

(c) Information is therefore needed when judging what is reasonable and what is not. The provision of such data is one of the basic reasons for the establishment of information systems.

(d) Information systems should, then, be designed in such a way as to enable a quick and easy access to data on terms and conditions (royalty rates, duration, restrictive clauses, training schemes, etc.) for similar contracts and technologies, either domestically or internationally (through the TIES system).

13. In some registries information systems are also assigned the function of following the internal flow of agreements and of detecting their position in the evaluation process as well as the officers in charge of them. This is a very important task for increasing registry productivity and for providing quick answers to enquiries from management or firms concerning the situation of specific contracts submitted for registration. Past experience with some registries has shown that this is an area where a lot of work remains to be done. In my view this and other relatively obscure and hidden aspects of registry information activities should be dealt with in the manual.

14. A model of the contents of the application form as well as some examples of forms used in various registries could be provided, since it would help other registries in designing their own forms.

15. One should be aware, however, that there is generally a tendency to include a lot of questions which are not relevant for evaluation purposes in the application form. If the application form is too long and detailed, obliging firms to provide too much data (both actual and projected), then the reliability of information will suffer. Accordingly, it should be stressed that when defining the contents of this form (and, in general, of data to be demanded from companies) a balance be established between quantity and quality of information; the information demanded should be the one needed for, and really made use of in evaluation activities.

16. Another question to be discussed concerns the pros and cons of having one or more application form, according to the type of technology transfer contract.

17. The contract card

This is the cornerstone of the information system and should be carefully designed, taking the following into account:

- evaluation criteria
- national policies on technology transfer
- characteristic of technology imports
- handling systems
- international or regional exchanges on technology transfer.

A model contract card could be provided in the manual. This seems to be a crucial point. In the first place because a large part of the information stored on such a card is not dependent on national policies. Secondly, because a model format will greatly help the future exchange of data under TIES or regional systems (this point may be further elaborated in the chapter dealing with the TIES system).

The manual should make registry managers aware that the implementation of contract cards is not a solution to all the information problems faced by technology transfer registries. Contract cards can be viewed as a cornerstone, but they need to be integrated within the whole structure, that is, the global information system.

18. Other internal information inputs

Apart from the basic elements identified above, there are others which are generated or organized within the registry which could be useful for contract evaluation. Since some of these inputs are connected with other registry functions (foreign investment, industrial property, etc.) the distinction between "other internal information inputs" and "background domestic information" is not straightforward and will vary from country to country.

19. Background international information

A short reference should be provided on international information that technology transfer registries have access to. The TIES system will be presented in detail in a separate chapter.

20. Information outputs

A number of information outputs of different types can be identified. Although this part of the manual is mainly concerned with those outputs required for evaluation purposes, it would be useful to provide a list of the various information outputs an information system can generate. Several of these will be broached in the following chapters.

21. The information (or ID) unit - organization, structure and location within the technology transfer registry

This is a very sensitive matter, where ready-made solutions are virtually impossible. The manual should therefore tackle these issues carefully, refraining from imposing model organizational patterns. A review of the main issues/questions should be undertaken and examples of solutions adopted by several countries could be provided.

22. The manual should stress the need for adequate interrelationships between evaluation and information flows. Comparative standard evaluation and information flowcharts could be designed and included in the manual, with country examples provided as well.

23. The information collection process (and the filling up of the main information) should be closely articulated with evaluation steps. 1/ A study of the evaluation system is essential for the correct design of an information system for a specific technology transfer registry. The preparatory work/studies for the manual could approach this point in more detail. It could also provide some examples of countries which had been successful in organizing their information systems and a discussion/presentation of several possible approaches would be preferable to the suggestion of a single solution.

IV. Extension of the basic information system

24. The basic information system has been developed according to evaluation needs and the purpose of the present chapter is to analyse the other objectives of information systems, apart from giving support to their evaluatory activities.

1/ For an experience on this matter, see Victor Corado Simoes, "Informe Tecnico: (...) Venezuela", pp. 27/28 and 53/55.

25. Monitoring

In my opinion document ID/WG.405/7 ("Monitoring of transfer of technology agreements by regulatory agencies - an overview of policies and issues") could be the basis for most of this chapter. Nevertheless, special attention should be given to payments arising out of technology transfer contracts, as this is the most immediate aspect of monitoring and does not usually imply any relationship with recipient firms but only between the registry and the central bank.

26. Additionally, monitoring should also be linked with evaluation of renewal demands. Even in those registries where monitoring does not exist as an autonomous activity, some kind of historical analysis of contract performance is usually undertaken when evaluating contract renewals.

27. Support for decision making

The manual should contribute towards increasing the awareness of technology transfer registry management, drawing attention to the importance and usefulness of good and up-dated statistical information for decision-making at both the registry and government levels.

28. Relationships with domestic business and scientific (research) communities

Information outputs can make a relevant contribution to strengthening the domestic technology basis and increasing the knowledge of domestic firms as to the characteristics of the technology market, increasing the capacity for technological choice and bargaining power.

29. Since technology is to a large extent information, the supply of domestic firms with information (although not necessarily core information 1/), will reduce the gap between the potential recipient and supplier of technology and therefore enable better terms and conditions for technology imports. In this framework, information on alternative technologies and/or alternative suppliers is of the utmost importance; however, the supply of this information could raise significant problems for registries. This will be discussed later.

30. The relationships with specific domestic technological communities ought to be underlined as well. Information on imported technologies can provide research institutes and centres with useful insights on business requirements and help them in directing their research efforts.

31. The manual should address itself to all these questions in some detail and contribute towards increasing the conscientiousness of the partial, yet fundamental, role played by technology transfer registries in the technological development process of developing countries.

V. Computerization of registry information systems

32. This chapter could be of considerable relevance in helping national technology transfer registries to undertake a "smooth transition" from a manual to a computerized system. Computerized storage and analysis of information is constantly expanding and technology transfer registries cannot stand aside in this trend. Furthermore, the availability of computerized facilities would enable an expansion of the functions ascribed to the information system.

1/ For definitions of core and peripheric technology, see Jose M. Caldas Lima and Vitor Corado Simoes, "O papel da informacao na transferencia de tecnologia", Lisboa, Ordem dos Engenheiros, 1980.

33. However, the organization of a computerized information system is not easy. It requires the previous design of an overall registry information system and some experience in dealing with technology transfer information. It should be stressed that the consequences of mistakes in the conception and implementation of computerized systems largely exceed those incurred in manual ones. Therefore, the implementation of computerized technology information systems should be carefully planned and should not result out of mere considerations of "fashion" and of the fear of being "old-fashioned".

34. The manual should provide a broad framework for registry computerization for a better performance of registry activities. It should as well warn of the most common mistakes occuring in the process of computerization and ways of escaping them.

35. It would be useful to briefly review the experience gathered by those countries that have already started on computerized systems (such as Philippines, Poland or Spain). One could learn from their experience by examining their mistakes and attempting to identify the correct procedures to be followed.

36. The need for a close interface between information and computer experts should be emphasized. They should be able to speak similar languages and be mutually understood so that computerization may meet the requirements of the previously designed overall information system.

VI. Regional and international information exchange

37. Information exchange systems: an overview

General background information on TIES and regional information exchange systems, namely SAIT (probably the envisaged ASEAN technology information system).

Broad introduction to their objectives and implementation. The usefulness of international information for a correct evaluation at the national level.

38. Technological Information Exchange System (TIES)

I see this chapter as a general presentation of TIES: it's objectives, experience and importance as a supplement to national information systems. The role of TIES as a contact point between national registries and TIES meetings as a forum for exchange of views should also be underlined.

It should however be strongly stressed that the success of TIES and its usefulness depends basically on the co-operation of national registries. The more countries participate, the more they can benefit from the system.

This part of the manual could be based on previous papers and reports worked out by UNIDO on the progress and aims of TIES (particularly the progress reports presented to the various TIES meetings).

39. Other aspects of information exchange

Reference should be made to ad-hoc information exchange to solve specific problems and the importance of this mechanism for contract evaluation. Relevant examples could be presented.

The development of TIES as a mean of promoting South/South technology transfer should also be mentioned and the advantages of a system for exchange of information on technologies available for sale or licensing in developing countries suggested.

The issue of strengthening South/South technology transfer is of the utmost relevance for all developing countries as everyone can benefit from increased information flows of available technologies This subject should be further developed in the manual, as a separate heading.

40. TIES coding manual

A revision of the TIES coding manual according to the changes introduced into the TIES coding form (preliminarily discussed in the May expert group meeting) could be presented. However, I think the disadvantages of including the TIES coding manual overcome the advantages. In fact, the coding manual is an operative tool and can be subject to periodical changes: it will not be used by registry managers but only by staff members charged with information tasks. Its inclusion in the envisaged manual would be an uncessary detail, since the manual is mainly concerned with the overall aspects of implementation and management of technology transfer information systems.

41. TIES and regional information networks

Co-operation and compatibility between TIES and existing or envisaged information exchange networks, such as SAIT or the ASEAN technology transfer exchange, should be elaborated.