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ESTABLISHMENT OF THE COMPATIBLE

REGISTRY INFORMATION SYSTEMS *

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UNIDO Secretariat

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INTRODUCTION

The experience accumulated so far by technology transfer registries clearly indicated the importance of the effective organization of information flows related to registry activities. It was found that improving the system of collecting, storage, processing and disseminating information may substantially contribute to the overall registry performance as well as increase the benefits resulting from the exchange of information within the Technological Information Exchange System (TIES) and other international systems.

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Consequently, this area has gained increased attention within the TIES co-operative framework. The problems associated with the functioning of the registry information system (RIS) were extensively discussed during the Seventh TIES meeting in 1982 in New Delhi and the Eighth TIES meeting in 1983 in Caracas. In addition, two expert group meetings on the subject were held in 1983 in Caracas and in 1984 in Vienna.

A series of expert advisory missions devoted primarily to establishing and/or strengthening the registry information systems were carried out in a number of developing countries during 1981-1984.

The activities outlined above contributed to the accumulated knowledge and experience in that field. As a result, it became possible to.

- identify major problems and issues as well as common elements of the functioning of the Registry Information System (RIS);
- define the unified concept of the compatible RIS;
- define the detailed course of action aimed at establishment of the compatible RIS.

These issues are discussed in detail in the consecutive chapters of the present background paper. The questions of international and regional exchange of information which are closely 15 ked with the functioning of the national registry information systems are outlined in TIES Progress Report 1983/1984

I. CRITICAL ISSUES OF THE FUNCTIONING OF THE REGISTRY INFORMATION SYSTEM

It is recognized that the information content of the system is, in principle, determined by the objectives pursued by the registry activities. These objectives may be translated into four principal activities, each having its own information requirements. These activities are:

- (a) evaluation and registration of technology transfer agreements;
- (b) follow-up and monitoring of the implementation of the technology transfer agreements;
- (c) advisory services for local enterprises in the process of technology acquisition;
- (d) implementation of policies for technological development, in particular policies regarding the transfer of technology.

As an auxiliary function, registries represent their governments in specialized regional and international organizations and participate in co-operative programmes such as SAIT and TIES.

It has to be emphasized however that the registration of technology transfer agreements is the principal function of the registry and other functions are taken up once the evaluation and approval procedures are mastered. Within the conceptual framework it is therefore logical to distinguish between the basic information system linked to the registration function and the extended information system covering other functions.

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Easic information system

2.1 The information inputs

A copy of the contract is the basic source of information for the registration procedure. In addition, registries usually request the submitting party (local enterprise) to attach completed application forms. $\frac{1}{2}$ The information coverage of the applilcation form is of utmost importance for the functioning of the whole system. The survey of forms used by the registries revealed that a substantial convergence of the scope of information contents exists, partly due to the fact that the respective formats of the matured registries were disseminated among TIES members in 1979 $\frac{2}{}$ and the newly established registries have used it as a basis for drafting their own questionnaires. The application forms usually include data on the recipient and supplier of technology, basic data abstracted from the agreement, information on technology to be transferred, expected economic, financial and technical effects of the implementation of technology to be acquired, etc. The application forms may differ substantially in scope and the major question arises as to the optimal set of information to be requested from the technology recipient. While the amount of information received positively affects the quality of the evaluation process, excessive information cannot be effectively consumed by the registry and creates a substantial burden upon the company submitting the agreement for registration. Closely related to this is the issue of reliability of information provided. In some sensitive areas the registry cannot expect reliable data from the company as the latter may be afraid that by providing such information, it will act against its interest. Obviously it is always possible to verify the data supplied but this is a costly and time-consuming process.

- 1/ Alternatively it is called a questionnaire.
- 2/ "Evaluation and analysis. Procedures of technology transfer agreements in developing countries", ID/WG.310/1, UNIDO, Vienna, 1979.

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2.2. The information outputs

As a result of the evaluation procedure, a decision is being taken with respect to the registration. The respective documents (registration certificate, information on rejection) become the principal outputs from the basic information system. In addition, registries usually prepare on an annual or bi-annual basis, an aggregated report for higher government bodies, providing data on office activities, number of contracts registered, etc.

3. Extended information system

3.1. Policies for technology development and technology transfer

In order to effectively participate in the implementation of policies for technology development and technology transfer, the registry has to establish effective channels for dissemination of information to other government agencies, the business and academic community, mass media, etc.

A regular publication which might be called "Annual Review of Technology Transfer in" could be used as a main tool for such communication. Obviously, the concept and methodology for preparing the "Review" ought preferably be designed in such a way that it may simultaneously serve as the country contribution to the TIES review of trends in technology transfer.

3.2. Monitoring

The need for implementing a comprehensive monitoring is being widely recognized among the registries. However, unsolved problems in the area of information collecting and processing are the major factors delaying the launching of this essential function in many countries. Except for <u>ad-hoc</u> action in some specific cases (e.g. contract renewal, conditional approval), only Poland has gained some experience in this activity. The launching of a monitoring function requires additional information input, i.e. progress report delivered by the recipient enterprise on the implementation of technology transfer agreements. This adds a substantial amount of information which has to be collected, screened, processed and stored. On the other hand, the possible outputs have not been clearly defined. Obviously the data from the system can be used for the preparation of aggregated studies such as the "Annual Review".

In general however, the time and labour requirements associated with collecting, screening, processing and storing information becomes one of the principal obstacles in implementing the monitoring function.

3.3. Assistance to local enterprises

In registries providing assistance to local enterprises in selecting technologies and negotiating agreements, the information system ought to be extended so as to be able to process requests from companies and provide answers to such requests. A further step in that direction could be done by launching a regular bulletin for the business community providing information on recently negotiated agreements, alternative sources of technology, practical advise on effective negotiation, new laws and regulations, etc.

4. Operational aspects of the RIS

4.1. Internal flows of information

Information flows and documentation on the process of evaluating agreements depend on the organizational pattern adopted in a given registry. Two basic patterns can be distinguished:

> the functional pattern when each contract is evaluated by different functional departments specializing in the technical, legal and economic/financial evaluation;

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the matrix pattern when one officer conducts evaluation of all aspects of an agreement while receiving functional inputs from other departments mostly through informal contacts. In the process of evaluation, officers usually specialize in technology agreements by industrial sectors.

By adding new functions (monitoring, advisory services) the information flows becomes more complex. Usually at that stage the need for the establishment of an information and documentation unit erises which would co-ordinate the information flows within the registry.

4.2. Abstracting information from the contract - the contract card

From the point of view of the effective functioning of the RIS, the contract card is without doubt the most essential document. The contracts are usually bulky, non-standardized documents which are difficult to handle. Therefore the registries usually abstract the vital information from the contract documents on the contract card. The introduction of the contract card in the RIS serves the following purposes:

- it enables quick identification of the vital elements of the agreement;
- it enables classification of the collected contracts
 by using various criterie;
- it enables comparative analysis of the actual versus projected figures for monitoring purposes;
- it facilitates the elaboration of the aggregated studies;

it facilitates linkages with other information
 systems in a given country and abroad, including
 TIES;

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 it may serve as the input form once the RIS is computerized.

The scope of information in the contract card differs among registries although as the comparative analysis indicates $\frac{1}{}(\text{see Annex I})$ a substantial degree of conformity exists. The contract card includes, as a rule, basic date on supplier and recipient, the major elements of the contract, information on the type and scope of registry intervention and the project data.

4.3. The information and documentation unit within the registry

At a certain level of maturity of registry operations and sophistication of its information system, the need arises for the establishment of a modal unit dealing with collecting, processing, disseminating and storaging information (ID Unit). During the initial phase, major functions of the ID Unit might be the following:

- collecting and filing of basic information from the recipient companies;
- supervising the flow of documents during the evaluation procedure;
- drafting and mailing documents in connection with the final registration;
- operating a central filing system, updating catalogues, etc.;
- completing TIES coding forms and handling a manual exchange of information within T_ES;
- operating an internal library within the registry.

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^{1/} See Report of the Expert Group Meeting on Registry Information Systems 9-11 May 1984, UNIDO/IS.483

In the process of expansion of the registry activities, the ID Unit may perform the following functions in addition to those outlined above:

- assisting registry officers in obtaining additional data from outside sources during the evaluation process;
- preparing statistical data for aggregated
 publications and studies;
- editing and disseminating of aggregated publications and studies:
- responding to cutside <u>ad-hoc</u> requests for information;
- collecting and processing of monitoring reports;
- operating computerized information systems, including external links with TIES and other data bases.

At present the well-defined concept of the ID Unit has not emerged as yet and the organization of information-related activities varies substantially between registries. In most cases the functions outlined above are distributed among registry officers or are assigned to one officer-in-charge of information processing and preparation of aggregated figures especially for TIES purposes. The need for a formal establishment of an ID Unit has only recently been noted by the more mature registries.

5. Computerization of the RIS

5.1. Introductory remarks

Recent dramatic changes in the area of microelectronics resulted in the increased use of computers in developing countries as well. This trend has already become noticeable in the operations of more matured registry

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information systems. $\frac{1}{}$ The problems of computerization of the RIS have to be seen in the context of the improvement of internal processing, collection and dissemination of information within a registry and in relation to the need for facilitating the regional and interregional exchange of information.

5.2. Manual versus computerized information systems

The implementation of a computerized information system in a registry usually takes place, once the manual system has been firmly established. It has to be pointed out however that due to legal and financial implications of registration procedures, computerization should never be seen as an alternative to the manual system. It should rather ease the identifying, abstracting, processing and disseminating of data from a manual file.

5.3. Factors affecting the programme of computerization

5.3.1. Density of an information stream

The density of an information stream is considered as a major factor determining the need and the effectiveness of computerization. Except for a very limited number of countries (Mexico, Spain) the number of agreements registered does not usually exceed 250 per year. Without going into extensive analysis, it may be stated that with such a density there is no acute need for computerization, as the information can be effectively handed in the manual system.

5.3.2. Maturity level and the functions performed by the registry

The need for computerization substantially increases once the registry embarks on additional functions such as monitoring and advisory services. Especially monitoring significantly increases the density of information flows. It is therefore believed that the comprehensive monitoring of all approved agreements cannot be effectively performed without computerization.

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^{1/} The experience of selected countries in the area of computerization has been presented in the document "Prospects of Technology Transfer Registry Computerization", UNIDO/IS.400, Vienna, 1983, as well as in the mission reports of the UNIDO consultants (J. Cieslik and C. Pawelczyk).

5.3.3. Participation in the computerization programme of higher gover ment bodies

The administrative units performing the registration functions in developing countries are often placed within larger government bodies such as ministries, investment boards, etc. In view of recent interest in the computerization of government institutions, this may bring additional impetus to the registry information system. It has to be pointed out however, that in this case, the registry may have low priority with respect to the designing of software and the access to the central processing unit. This may be overcomed by the more flexible hardware configuration in which a minicomputer located in the registry is linked to the central processing unit.

5.3.4. Participation in the international exchange of information

Obviously, the international exchange of information and participation in the information networks can be greatly facilitated by introducing a computer. Computerization would definitely contribute to the more effective exchange of information within TIES. 1/ At the regional level the ambitious computerization programme of the Andean Pact should be mentioned in the first place. Naturally, the participation in regional and interregional computerized networks calls for necessary actions with regard to computerization at the national level.

^{1/} E.g. the tapes containing basic data on all technology transfer contracts in the TIES system can be sent to registries which might in turn independently conduct a search of the TIES data base without contacting the UNIDO Secretariat.

5.4. Computerization programmes currently implemented by various registries

At present a limited number of registries embarked on computerization of their information systems. This group includes Argentina, Philippines, Poland and Venezuela. In other countries, especially those where the registries are placed within the larger government institutions, technical facilities already exist for switching over to computerized systems within the next 2-5 years. At this stage of registry computerization, a noticeable diversification already exists as to the overall concept of computerization, hardware configuration, programming language and the software used by the various registries.

II. TOWARDS THE UNIFIED CONCEPT OF A COMPATIBLE NATIONAL REGISTRY INFORMATION SYSTEM

1. The need for a unified approach

An overview of the major issues arising from the functioning of the RIS clearly indicated the need for a unified approach towards registry information systems among TIES member countries. Without underestimating the differences between registries, some common elements are already well defined. The unified approach will result in the establishment of a compatible registry information system thus enabling an exchange of experience leading to a more effective functioning of the RIS and facilitating an exchange of information on technological transactions at the regional and interregional levels.

The need for such a unified approach may be further underlined by the recent efforts towards computerizing registry information systems conducted in several countries. From the experience collected so far, it is clear that without adopting a unified approach, computerization may not bring the expected results, especially when it comes to the exchange of information within TIES.

It should be made clear however that the overall concept of a compatible registry information system has to be flexible enough as to allow adjustment to specific conditions prevailing in a given country, providing a framework for extended regional co-operation, etc.

2. Principle components of the unified concept

2.1. The contract card

As pointed out earlier, the contract card emerges as a key element of the registry information system. The compatibility of the RIS(s) may only be achieved if a common information component in the contract card is well defined and widely accepted by the registries. Simultaneously, the computerization of the RIS may be effectively implemented in a unified way by using the contract card (or its common element) as the input form for the computerized system. Therefore, the UNIDO activities aimed at achieving a greater degree of compatibility of RIS(s) should concentrate on devising the unified concept of the contract card during the first stage. The preliminary model contract card was prepared for this purpose (see Annex I).

2.2. The functioning of the information and documentation unit

It is expected that the sophistication of the RIS will gradually lead to the establishment of an information and documentation unit in each registry. The principal functions, composition and procedures of such a unit could be standardized in line with the terms of reference provided by the UNIDO Secretariat.

2.3. The programme of computerization

The shift towards computerization represents a major step in the sophistication of the registry information system. The unified concept of the computerization programme backed by the assistance for the registries embarking on such a programme is the basic requirement for the full exploitation of advantages associated with computerization at the national, regional and interregional level.

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III. PROGRAMME OF ACTION

1. Introductory remarks

The activities aimed at strengthening registry information systems and assuring a greater compatibility in that area shall definitely gain importance and emerge as a major programme within the TIES co-operative framework. Such a programme should be oriented towards achieving long-term objectives. Taking into consideration the 1984-1985 period, it is suggested that this programme contains the following interrelated elements:

- establishment of a TIES working group on the registry information systems;
- preparation of a demonstration model for the compatible RIS (manual and computerized);
- conducting a series of expert missions to TIES member countries for the purpose of implementation, extension and/or computerization of the registry information systems;
- preparation of the manual on the establishment of the registry information system.

2. Establishment of the TIES working group on RIS

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Although the major issues related to the establishment of the compatible registry information systems will be presented for consideration during subsequent meetings of heads of technology transfer registries, there is a need to establish contacts among people directly involved in the matters of information handling. This might be achieved by establishing informal working group on the RIS within TIES. The group shall consist of:

- persons in charge of information and documentation
 designated by each registry;
- UNIDO experts specializing in the area of information and computerization of the RIS.

One of the essential activities of the working group will be the organization of training workshops on information handling covering such issues as the implementation of efficient information and documentation procedures in the process of evaluation and registration, organization and functioning of the ID Unit, programme of computerization, new forms of international exchange of data, etc.

The Expert Group Meeting on Registry Information Systems which took place from 9-11 May 1984, in Vienna $\frac{1}{}$ may be considered as the first step towards the establishment of such a working group.

3. Preparation of a demonstration model for the RIS

The expert group meeting referred to above recommended $2^{/}$ that a demonstration model of an information system (manual or computerized) based on a model contract card as input and as minimum output formats the contract card, product file, company file, TIES I, II B, registry performance and monitoring aspects be prepared as soon as possible and preferably demonstrated at the Ninth Meeting of Heads of Technology Transfer Registries.

4. Conducting a series of expert missions to TIES member countries

Depending on the resources available, a series of expert missions could be organized. These missions could be aimed at implementing (computerizing) registry information systems in a number of TIES member couantries. An effort should be made to include in the sample countries at different levels, with different problems to be solved, e.g. countries with newly established registries interested basically in the efficient manual system, countries intending to computerize their registries, embarking on monitoring, advisory services, etc. The missions of individual experts should be co-ordinated with the programme of work on the manual and the mission reports should contain recommendations on the issues to be dealt with in the manual. The results of the missions can then be presented in an aggregated form to the TIES meetings.

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^{1/} See Report of the Expert Group Meeting on Registry Information Systems,

⁹⁻¹¹ May 1984, UNIDO/IS.438

 $[\]frac{2}{}$ See Report, op. cit., para 3.

5. Preparation of the manual on the establishment of the RIS

Based on the experience collected during the expert missions to individual countries, a comprehensive manual on the establishment of the registry information system should be prepared. It will serve as a basic tool for the registries to solve varicus problems connected with the functioning of their information systems. In addition, the preparation of the manual shall coatribute to the unification of individual systems and ensure compatibility with TIES. The outline of the manual is given in Annex II. It is recommended that the final version of the manual be prepared for the tenth meeting of TIES A preliminary version of the manual for discussion purpose only has been prepared by Mr. Victor Simoes of the Foreign Investment Institute of Portugal. $\frac{1}{}$

6. Resources necessary for the implementation of the programme of work

The resources necessary for the establishing and/or strengthening of compatible national registry information systems will have to be provided in the first place by the interested countries. Past experience indicates that additional funds, especially for financing services by the outside experts, can be allocated for this purpose under country projects financed from UNDP sources. The limited sources in disposition of the UNIDO Secretariat might be used primarily for the activities conducted at the international level (revision of the TIES, demonstration model of the computerized system, preparation of the manual, etc.).

1/ Manual on the establishment of registry information systems - Some considerations. (ID/WG.429/2

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ANNEX II

MANUAL ON THE ESTABLISHMENT OF THE REGISTRY INFORMATION SYSTEM

(Outline)

I. Introduction

- 1. General considerations
- 2. Objectives of the manual
- 3. Contents of the manual.

II. Objectives and general characteristics of registry information systems

- 1. Objectives
- 2. Functions
- 3. Characteristics
- 4. Information handling systems.

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- 1. The relevance of the basic information system
- 2. Outline of the basic information system
- The ID Unit: organization, structure and location within the registry.

IV. Extension of the basic information system

- 1. Monitoring
- 2. Support for decision making
- 3. Relationships with domestic business and scientific research communities.

V. Computerization of the registry information systems

- 1. Factors affecting the decision
- 2. The procedure of introducing computer facilities
- 3. The software issue.

VI. Regional and international information exchange

- 1. Information exchange system: an overview
- 2. TIES
- 3. TIES coding manual
- 4. Information linkages under manual systems
- 5. Information linkages under computerized systems
- 6. TIES and regional information retworks.

