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ESTABLISHMENT OF INDUSTRIAL TECHNOLOGY AND MARKET  
INFORMATION NETWORK (ITMIN)

SRL/93/010/A/01/99

SRI LANKA

Technical report: starting the establishment of ITMIN;  
first mission of the CTA\*

Prepared for the Government of Sri Lanka  
by the United Nations Industrial Development Organization,  
acting as Implementing Agency for the United Nations Development Programme

Based on the work of Erik I. Vajda  
Chief Technical Adviser

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Vienna

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\* This document has not been edited.

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**EXPLANATORY NOTES**

**Currency**

According to the actual UN operational rates 1 US dollar is equivalent to 49.50 Rupees of Sri Lanka, what means that the Rupee has the value of 0.0202 USD.

**Acronyms and other short terms used**

- APCTT - Asian and Pacific Centre for Transfer of Technology
- BC-NET - Business Cooperation Network (maintained by the Commission of European Communities)
- BOI - Board of Investment of Sri Lanka
- BL - British Library
- BBB - Business to Business Bridge
- CD-ROM - Compact Disk - Read Only Memory; an opto-electronic medium for the storage of large amount of retrievable data on a special diskette
- CDS/ISIS - short name of a database management software developed by Unesco for the storage and retrieval of (mainly textual) data on microcomputers
- CISIR - Ceylon Institute for Scientific and Industrial Research
- CISM - Consultant on Information Systems Management
- CTA - Chief Technical Adviser
- DFCC - Development Finance Corporation of Ceylon
- EDB - Sri Lanka Export Development Board
- EDDI - Expert on Database Design and Implementation
- FP - Focal Point (of ITMIN)
- GKCC - Golden Key Credit Card Company
- INFOMART - name of a consumer information service; a branch of GKCC, managing ITMIN Ltd.
- Internet - name of a world-wide network of computer networks

-continued

- used for electronic mail, for access to databases, documents, and for mutual use of computer resources
- ITMIN - Industrial Technology and Market Information Network
- INTIB - Industrial and Technological Information Bank (of UNIDO)
- LAN - local area network
- METI - Mechanism for the Exchange of Technology Information (a project at APCTT)
- MID - Ministry of Industrial Development
- NDB - National Development Bank of Sri Lanka
- OMIKK - Hungarian acronym for National Technical Information Centre and Library (Országos Műszaki Információs Központ és Könyvtár)
- PSDN - Packet switched data network
- RFP - Request for proposals
- RFQ - Request for quotations
- SQL - Standard Query Language
- TIPS - Technological Information Promotion System
- WAN - wide area network

ABSTRACT

Personal author: Erik I. Vajda  
Corporate author: UNIDO  
Title of project: Establishment of Industrial Technology and  
Market Information Network (ITMIN)  
Number of project: SRL/93/010/A/01/99  
Title of report: Starting the establishment of ITMIN:  
first mission of the CTA

The ITMIN project is executed by the Government of Sri Lanka and implemented by ITMIN Ltd. and UNIDO. The latter's role is the provision of the mainly advisory services of a Chief Technical Adviser and an Expert on Database Implementation, as well as, of short term consultants. The report gives an overview of all major project activities. The work plan was revised. New aspects for the development of ITMIN were introduced: ITMIN as Internet service provider and as business information centre. The selection and acquisition of computer and telecommunication software and hardware was prepared. Library installation has been designed and information sources (CD-ROMs, books, periodicals, online hosts) were selected. The possibilities of co-operation with various international information systems were studied and contacts were established. The content and structure of ITMIN Focal Point databases has been defined and conceptual datamodels were prepared. Outlines were prepared on the linguistic (indexing) tools, to be used by ITMIN, and for the principles and methods for establishing an ITMIN pricing scheme. The principles of cooperation of the nodes and the focal point were outlined and discussed, the planned ITMIN activities were presented to the nodes. Local introductory training was provided to and appropriate study tours and training courses abroad were organized for the ITMIN managers, information officers and librarians.

## INTRODUCTION

This report is based on the activities accomplished during the first mission of the Chief Technical Adviser (hereinafter: CTA) from 25 November 1994 to 23 April 1995 (including travel and work in the field from 26 November 1994 to 22 April 1995, but excluding one day briefing and one day debriefing at UNIDO headquarters in Vienna).

In an irregular way this introduction has to outline in short some special features of this project:

- \* the Government Executing Agency is the Ministry of Industrial Development, but its function is a supervising one and the project is implemented by ITMIN Ltd., a public private company.
- \* ITMIN Ltd. is managed by the Golden Key Credit Card Company (hereinafter: GKCC) through INFOMART, a consumer information centre, a branch of GKCC;
- \* ITMIN Ltd. is governed by its Board of Directors, composed of representatives of its shareholders, being also nodes of ITMIN. The Managing Agent is supported by a Management Committee, composed of some members of the board (including the Director, General Manager of GKCC, who is the Director of ITMIN, too) and the Manager of ITMIN;
- \* ITMIN Ltd. as such does not have a staff, but its staff is provided by GKCC, the Managing Agent;
- \* the role of Unido as executing agency is limited to the assignment of the CTA, the EDDI and of short term consultants whose functions are advisory/assisting functions.

However, it was found that the present report serves the interests of the project in a greater extent if it gives an overview on all project activities, including the non-administrative project activities of the national implementing agency, ITMIN Ltd., rather than being limited to the activities of the CTA

and the other members of the international staff: the Expert on Database Design and Implementation (hereinafter: EDDI) and the Consultant on Information Systems Management (hereinafter: CISM).

The original objectives of the phase covered by the report as defined in the Work Plan (see Annex 4.) were not modified, although it became necessary to modify the deadlines in the Work Plan and further modification will be needed because of various reasons to be described in the body of the report. These modifications do not influence the final deadlines. The main objectives of the phase covered by the report were achieved or the project activities enabled their achievement in the near future.

## I. ACTIVITIES

The subject of the subsections below follows in general the listing of outputs/activities in the Project Document/Work Plan. However, because activities for some outputs will follow only at a later phase, whereas activities for other outputs were mainly covered by this phase, some restructuring was unavoidable as it can be seen from the table of content.

### A. Preparations, planning and new policy features

The establishment of ITMIN Ltd. and the appointment of the Managing Agent was done according to the plans. The refurbishing of ITMIN Focal Point (hereinafter: FP) offices was delayed. The premises were declared open at the 9<sup>th</sup> of December 1994 by Mr. J.K. Robert England, Resident Representative of UNDP and from this time the ITMIN staff and the international team are working in these premises. A part of the planned office equipment was installed, an other part had to be replaced by outdoor services. The arrival of the CTA, the EDDI and the CISM was also delayed.



Taking into account the delays mentioned above, some unrealistic deadlines, and also the necessary changes in the description of activities, the work plan has been modified, and the modified work plan was approved by the Board of Directors of ITMIN (hereinafter: Board). The modified Work Plan and a bar chart version of it, prepared by the CTA, is given as Annex 4. However, further modifications will be necessary, because of changes in the procedures for the acquisition of computer hardware and software, because of missing background information for some other tasks and because of other reasons. The amended and, hopefully, final work plan should be prepared in due course.

The job descriptions of some experts and consultants were de facto changed, taking into account among others the capabilities of the EDDI and of the CISM to deal with the hardware aspects, too and the delay in proposing appropriate experts for some posts. In addition, the CTA, in cooperation with the other members of the international team and with the Manager of the national implementing agency, prepared a proposal for changes in the fielding of experts. This proposal was agreed upon by the Board and was submitted to UNIDO. The continuing delay in proposing appropriate persons as consultants can result in further changes.

In spite of the thorough preparation of this project it became clear, that because of the development of information technology, and to achieve the self-sustainability of ITMIN, some new aspects and features for the development policy of ITMIN should be considered.

The first of these features is Internet. Just at the start of the project activities (in December 1994) it became clear that the use of Internet is a must for ITMIN, both for better communication and for accessing information sources/databases available through INTERNET. Already at this time the idea appeared, that ITMIN should provide Internet services to its users, too. Dr. M. Muraszkievicz,

the CISM, stressed this idea, and made the proposal, that ITMIN should operate as a full Internet service provider. He prepared a detailed report and proposal on this matter what is included as an Appendix to his Technical Report (MUR95). The Board approved these proposals and the hardware and software needs were taken into account when designing the ITMIN computer and telecommunication system and when asking for proposals (see Subsection 2.).

The other new accent is business information. This has been considered from the very beginning as an important part of ITMIN activities (see market information in the name of ITMIN and the original concept of databases in the Feasibility Study (FST92) prepared during the preliminary project assistance phase). The concept of Business to Business Bridge (BBB) proposed by the CISM goes further. The main idea is, that ITMIN should provide complex services to businessmen, with special regard to owners/executives of small and medium sized enterprises (SMEs). This means that ITMIN should be prepared to meet all information needs of business people, not limited to technology and market information and should act as a bridge between business people, by providing business information through computers, orally and also by publications (e.g. company information), by providing E-mail services, and by acting as an information broker. The relevant proposal was also discussed and approved by the Board and is a further appendix to the report of the CISM.

These new aspects/features do not change the original concept and objectives; they rather contribute to their achievement.

**B. Selection of computer and telecommunication hardware and software; library equipment**

According to the Project Document and the Work Plan specifications had to be submitted for a turn-key solution contract among others for computer hardware, software, telecommunication equipment

and application software development. After the arrival of the EDDI (replacing together with the contributing CIMS also the Consultant on Hardware and Telecommunication) it was clarified, that the submission of specifications, without the previous knowledge of the capabilities and proposals of local vendors would be premature. It became also clear, that it is not sure that the necessary hardware, software and software development (including telecommunications hardware and software), can be provided by one single main contractor and its subcontractors.

The EDDI, with contributions of the CISM prepared the design of the system architecture, deviating at some points (two Unix servers, one for databases and an other for telecommunications control; a CD-ROM tower instead of single drives, Internet connection etc.) from the version included into the project document. Interested vendors were informed on the planned system and a Request for Proposals (RFP) was prepared and submitted to vendors. The RFP was prepared in the form of a detailed questionnaire, covering technical and commercial aspects of all system's elements. The Board approved the design of the system and the procedures outlined above. It set procedures for the RFP and for the handling and evaluation of submitted proposals.

The evaluation scheme and methodology, prepared by the EDDI, with the contribution of the CISM is appropriate for objective evaluation: the individual items and their features have predefined weights, and the scoring system was also defined in advance. The evaluation criteria and methodology were approved by the Board, too. Based on the evaluation and on some clarifications from the vendors' side a specification and a Request for Quotations were prepared and submitted to the vendors, who submitted the earlier proposals. The Board appointed Technical and Commercial Evaluation Committees, which agreed on the further procedures and a timetable. The deadline for submitting quotations expired at the time of the preparation of this report. According to the revised timetable for

selection, ordering, development, installation and acceptance, the system will be installed and accepted before the end of June.

As far as software development is concerned this process covers only the development of the relational database management software for the creation and use of ITMIN databases. For the development of the CDS/ISIS software see Subsection D.

Based on the functions of the ITMIN Library and on the available library space, the CTA designed the library furniture and other library equipment and their arrangement. The arrangement makes it possible to conduct also training in the library, after slight rearrangement of the mobile part of the furniture. Specifications were prepared together with the ITMIN staff, based on local and foreign experience and on catalogues, acquired by the CTA. The specifications were submitted to vendors, asking for quotations.

C. Selection and acquisition of information sources: setting up co-operation with international information systems

Proposals were prepared by the CTA with some input of the CISM for the acquisition of CD-ROMs, books and periodicals (primary and secondary), and for the selection of online hosts. The selection was difficult because of the lack of important information sources on information sources (first of all CD-ROM versions of catalogues and directories).

It was proposed by the CTA at the very beginning, that primarily sources of business and market information should be acquired. This is justified first of all by the quantity of technological information sources, what is so large that there is no chance for the ITMIN FP to establish a significant collection. The online access to technological databases and the collection of some secondary sources (CD-ROM or printed) can solve this problem.

The second reason for this policy was the existence of the Library of the Ceylon Institute of Scientific & Industrial Research (CISIR) in the same building where ITMIN is based. CISIR is a node of ITMIN and the science and technology collections of the library are significant. The proposal for CD-ROMs and periodicals was harmonized with the CISIR library, whenever this was deemed necessary.

The selection and evaluation of CD-ROMs for subscription (purchase) was based on proposals made in the Feasibility Study, on the knowledge of the CTA concerning business and technological CD-ROM databases and on some lists collected from other sources. A tentative list was prepared, and the relevance of titles was evaluated and scored. This evaluation was analysed and the costs of several variants were compared with the available funds. Following this, a price quotation was asked from various vendors, to prepare the final decision on CD-ROMs to be purchased.

On the basis of the price quotations and on the refinement of data based on detailed information on the CD-ROMs received from the vendors, as well as, on the CD-ROM directory, (the printed 1993 version of which arrived finally) the final proposal was prepared and it was also decided that the CD-ROMs will be ordered for single user mode and not for use by any work station in the LAN, because of the enormous differences in prices. Finally priority lists and a proposal for subscription (ordering) were prepared. The proposal was based on the idea, that at the first phase not all the proposed CD-ROMs should be ordered, because only on the basis of real information requests it can be decided, which databases should be acquired on CD-ROM, and in which cases the frequency of queries makes the online access to the databases more justified. The postponement of the ordering of titles of a secondary or tertiary priority is also justified because at a later stage this decision can be based on the knowledge of the remaining funds. The proposal was submitted to the ITMIN management for further actions

The library of ITMIN will be a typical reference library. Therefore the main idea for the selection of books and periodicals (in addition to the subject considerations mentioned above) was, that only such books and periodicals should be acquired (subscribed), which can be used for the direct retrieval of data and/or for selection of information for input into the ITMIN databases.

The basic sources for selection were similar to those for CD-ROMs (although the part of the Feasibility Study concerning proposed books was only referred to, but missing). The procedure was also similar, but prior to the preparation of priority lists no price quotations were asked from vendors. The data in the various sources were anyhow not sufficient and therefore the CTA consulted the relevant sources at the Library of the British Council in Colombo, to prepare a file for selection. The priority lists and the proposals were submitted to the management of ITMIN to decide about asking price quotations (prices are included into the lists but are not necessarily up-to-date) or ordering the books and subscribing to the periodicals immediately. The selection of Sri Lankan books and periodicals and of UNIDO publications/documents was unfortunately not possible, because of the lack of the necessary sources.

According to the project document online accessible databases should be selected for subscription. Obviously only the services of online hosts can be selected. The most important online accessible databases were analyzed by the CTA and the CISM, to determine the online hosts through which these databases can be accessed. As a result of the analysis Dialog, Data-Star (these to hosts merged in the meantime), STN International and Gesellschaft fuer Betriebswirtschaftliche Information (GBI) were selected. This range can be extended if necessary, but practically all relevant databases are covered by these hosts. Letters were sent to the selected hosts,

introducing ITMIN to them and asking for further information on their services and subscription procedures. Dialog/Data-Star and STN sent the information asked for. The contracts can be signed before the establishment of the necessary telecommunication links. Information officers of ITMIN got and will get the necessary training to make online searches.

International information systems are important information sources for ITMIN services, if their databases can be downloaded to the ITMIN databases or if they are online accessible, but also if ITMIN can rely on information services offered by them.

Contacts have been set up by the CTA on behalf of ITMIN with the information systems maintained or planned by UNIDO/INTIB: Energy and Environment Information System (EEIS), International Referral System, Industrial Development Abstracts. Other information systems, established by UNIDO, like the International Directory of Industrial Subcontracting and Partnership Exchanges have been also studied for planning further co-operation.

The Regional Coordinator of the Technology Information Promotion System (TIPS) contacted the Ceylon Chamber of Commerce with the idea to set up a National TIPS Bureau in Sri Lanka. This proposal was submitted to ITMIN. It was planned anyhow to set up co-operation with TIPS and, therefore, a conceptual proposal and various questions were submitted to the Regional Coordinator. The first answer was encouraging but some questions are still waiting clarification. Co-operation was also proposed for the Mechanism for the Exchange of Technology Information (METI), a project of the Asian and Pacific Centre for the Transfer of Technology (APCTT). Further clarifications are needed in this case, too. Other international systems will be contacted at a later phase.

A major problem of co-operation with the international systems is caused by the way as they are designed. The designers of these

systems are going into organizational and functional details, which are often mutually contradictory, and do not fit in to the ITMIN framework, or in the framework of national information systems and policies in general. It is planned to prepare a note and a proposal on these problems.

D. Preparing methodology: databases, linguistic tools, pricing schemes

For the time being the most significant methodological work (what is a pre-condition for the development of the ITMIN databases and of the application software) was the preparation of a conceptual datamodel for the ITMIN databases. This was preceded by the re-planning of these databases, partly because of the introduction of the "BBB" aspect and partly, because the original concept of databases as it was set up in the Feasibility Study and in the Project Document proved to be not entirely feasible and satisfactory. The plan of databases to be established was discussed on the basis of the proposals made by the CISM. After the amendment and refinement of this plan, the CISM, with the contribution of the CTA prepared the first draft version of the conceptual datamodel. This was edited by the CTA and presented to the EDDI for further action. The models need further refinement and additions; for some data-bases of secondary significance and having simpler structure, the datamodels were not prepared yet. However the development of the application software (database management software) can be started on this basis after the selection and delivery of the shell software.

For the establishment of the databases further contributions of the CTA, the EDDI and the CISM will be needed, to normalize (standardize) the data contents, to prepare the procedures for collection, checking and input of data, to design output forms, etc.



Preparatory negotiations works should be started on the downloading of various data from the nodes of ITMIN and from other sources to the ITMIN databases.

In this context it should be mentioned that it is planned to develop CDS/ISIS based variants of the databases, for the nodes who wish to download databases of the Focal Point. CDS/ISIS will be also the software used for library databases and for thesaurus maintenance. For this an advanced CDS/ISIS adaptation should be prepared by subcontracting an appropriate software development company abroad.

For the functioning of the databases it is extremely important to make subject retrieval possible by appropriate linguistic tools (this term is used instead of the more exact term of "information retrieval languages", to avoid confusion with query languages - SQL, etc). The basic idea is, that the retrieval of information by subject should be made possible by classification schemes and by linguistic tools based on the natural language (thesaurus and free, but formalized, keywords) in addition to the free text search of some data. The outline of the system, including the selection principles of tools to be used is given in Annex 5. More detailed principles could not be prepared and the final selection of linguistic tools could not be made because of the delay in getting the necessary information, requested much earlier.

One of the key issues for the self sustaining and revenue producing ITMIN is the establishment of a sound policy of pricing and of pricing schemes. The cost and revenue calculations in the Feasibility Study are abstract and therefore useless, not speaking about the erroneous policy suggested by the Feasibility Study, to start with low prices and rise the prices later. This leads to the loss of confidence of users. Therefore the pricing policy and the pricing schemes must be developed from scratch. Basic principles of pricing and the essential structure of establishing the pricing

schemes are laid down in Annex 6. Unfortunately, because of lacking time and basic data, the schemes can be established only during the next mission of the CTA.

E. Building relations between the focal point and the nodes

The legal and financial relations between the nodes and ITMIN are clear and exactly agreed upon. The nodes are all shareholders of ITMIN, with the exception of the Ministry of Industrial Development and the Office of the UNDP Resident Representative in Sri Lanka. Their representatives are members (Directors) of the Board of Directors of ITMIN.

The establishment of a wide area network (WAN) of computers, including the nodes and the FP is also more a technical than an essential problem and the provision of hardware and application software to the nodes can be solved, although it needs thorough preparation and harmonization.

The essential problem is the relation of the nodes and the FP as information providers. This is not a general problem; many nodes are only users of information, or more exactly they do not provide information to external users. Some nodes, however, like the Board of Investment of Sri Lanka (BOI), the Sri Lanka Export Development Board (EDB), CISIR and GKCC are information providers for the public. The nodes of ITMIN, are at the same time independent institutions, also as information providers. Here is a checklist of questions which are not or only partly answered yet:

- \* Will the nodes charge the users for their information services, (not only with nominal charges and/or with charges for technical services)? If so, how these charges will be related to the charges of the FP ?

- \* Are the information services of the nodes considered as ITMIN services in general, or when using the resources of the FP or of other nodes for the preparation of their services, in particular?
- \* Who should answer the users' inquiries, if they can be answered only by co-operation of more nodes or of one or more nodes and the F. ?
- \* How to avoid to referring the user to an other point and ensure at the meantime the best level of services ?

Some other questions are already answered, e.g, all parties agree on the principle that the nodes and the FP should mutually charge each other for their services (downloading of databases, information searches, online use of each others databases, etc.). It is also agreed that the "system-internal" prices should be lower than those used for charging the users.

The CTA and the Manager of the FP visited most nodes and a draft statement of principles of co-operation was prepared. The Board discussed these principles, but final agreement can be reached only after the establishment of the WAN, after starting the FP services and after establishment of the pricing scheme.

The Board asked the CTA to present the plans on the development, structure, node/FP relations and pricing principles to the chief executives of the nodes. The outline of this presentation (made at the 13<sup>th</sup> of April 1995) is attached as Annex 7.

#### F. Training

After the selection of the staff of the FP, the CTA prepared a proposal for the training of information officers and librarians abroad. It was clear that before this training the candidates have to get introductory training, because non of them had the learned background or the experience of librarians and/or of information

officers providing technology, market and business information services. Their knowledge on the use of computers was also limited. ITMIN organized training for the librarians on the essentials of library activities presented by a library professional and for both librarians and information officers on the use of computers (subjects of the later were defined by the CISM and the EDDI). The CISM provided a series of lectures on the information profession, on essentials of the use of computers for information services, on the use of CD-ROMs and online databases and on the Standard Query Language (SQL). Most lectures were supported by demonstration on computer and/or by distribution of handouts. The CTA also presented a series of lectures on the origin and types of information services, on the structure, parts and operations of information systems, on information retrieval systems and on information retrieval languages (indexing languages, linguistic tools).

Appropriate institutions were looked for and were found for a one month training of two librarians and five information officers. Both groups will be trained by the same institutions: British Library (BL), the National Technical Information Centre and Library (OMIKK, Hungary) and, for a short time, by UNIDO. The main subjects for librarians are the essential activities of libraries, with special regard to business libraries and their services, the use of the reference library for information retrieval and input, and the use of databases (in short). The subjects for information officers are: CD-ROM and online retrieval, packaging and repackaging of information, CDS/ISIS essentials, organization and provision of business information services, use of library resources for information services. Both groups will get an introduction into the information activities of UNIDO, too. The training is going on at the time of writing this report.

A study tour for two managers of ITMIN was also organized, for getting acquainted with the structure, organization and management

of technology, market and business information services. They are going to visit BL, UNIDO and OMIKK and institutions proposed by them, but they will also visit BC-NET, the Business Cooperation network of the European Communities, and business information institutions in Finland. This study tour is also going on.

Preparations were made also for the training of application programmers abroad. Unfortunately this training had to be postponed, because till date the Managing Agent was not able to find the appropriate candidates with the necessary background needed both for training and for further activities. Hopefully the candidates can be selected soon and the appropriate training can be organized.

## II. CONCLUSIONS

The following conclusions can be drawn from the experiences gained during the reporting period:

a) The objectives as reflected by the Project Document can be attained and the final deadlines as reflected by the revised Work Plan can be met in spite of some delays in the anyhow overfilled first eight months.

b) The special structure of the implementation of the project (private sector company managed by a private sector Managing Agent) seems workable in spite of some problems mentioned in the body of the report.

c) The extended ITMIN activities will meet real needs of Sri Lankan users if the adequate quality of services can be assured.

d) The self-sustaining of ITMIN can be achieved if additional brokerage and other services will accompany the provision of industrial technology, market and business information.

### RECOMMENDATIONS

1) The urgent revision and amendment of the Work Plan and, if necessary, of the wording of the project activities in the Project Document is recommended to the implementing agencies. The approval of the amended work plan is recommended to the National Project Management and to UNDP.

2) The urgent submission of proposals for the hardware and telecommunication expert or experts is recommended to UNIDO. The urgent selection of the expert(s) is recommended to the National Project Management. The urgent fielding of the selected expert(s) is recommended to UNIDO. In the case that this cannot be done, within the time limits required by the work plan, the hiring of national experts and the appropriate budget revision is proposed to the National Project Management and to UNDP.

3) The acceleration of the selection or recruitment of appropriate candidates for the posts of application programmers and the organization of their training is recommended to the National Implementing Agency (ITMIN Ltd.).

4) The earliest possible decision on the subcontracting of the CDS/ISIS software development is recommended to the National Implementing Agency.

5) The urgent ordering of foreign CD-ROMs, books and periodicals, as well as, of library equipment is recommended to the National Implementing agency.

6) The acquisition of source lists of Sri Lankan books and periodicals is recommended to the National Implementing Agency.

7) The preparation of the acquisition of input data to the major ITMIN databases is recommended to ITMIN Ltd. In this context negotiations with the Ministry of Industrial Development and with other bodies on the acquisition of company data, with the Sri Lanka Customs on the acquisition of export-import data are particularly recommended.

8) The setting up of an "Information sources toolkit" to improve the selection of information sources for industrial information projects is recommended to UNIDO.

### ANNEX 3 JOB DESCRIPTIONS

#### UNITED NATIONS DEVELOPMENT ORGANIZATION UNIDO

#### JOB DESCRIPTION

- POST TITLE** : Chief Technical Adviser,  
Expert in Establishment and Management of Information  
Systems (11-01)
- DURATION** : 13 months split mission
- DATE REQUIRED** : October 1994 to April 1995, August 1995 to January 1996
- DUTY STATION** : Colombo, Sri Lanka
- PURPOSE OF PROJECT** : To strengthen and upgrade industrial and market activities by providing mainly the private sector as well as public sector decision makers with domestic and foreign information relevant to their needs through the establishment of the pilot Industrial Technology and Market Information Network (ITMIN)

#### DUTIES

The Expert will be attached to the ITMIN Ltd and will be expected to carry out the following activities (in close co-operation with the Managing Agent)

- 1] To co-ordinate and report on the project progress.
- 2] To participate in preparation of the specifications concerning the ITMIN telecommunication, computer hardware, database software, library furniture and auxiliary equipment as well as the identification of the contractor/contractors who will undertake the contract for database application software development under Oracle or any other software acceptable to ITMIN and under CDS Micro ISIS.



- 3] To participate in the evaluation and selection of the offers received and to assist the Managing Agent in providing recommendation to ITMIN Ltd for final selection.
- 4] To assist Managing Agent to recommend to ITMIN Ltd along with experts 11 -02 and consultants 11-52 and 11-53 study tours in leading foreign institutions on advanced techniques in industrial and market information for 5 information officers and managers and fellowships for 3 librarians, 4 information officers and 3 database application programmers.
- 5] To assist in the establishment of the Focal Point information infrastructure, in particular the selection of CD-Rom databases and primary and secondary documents to be purchased and the on-line services to be subscribed to.
- 6] To co-ordinate and assist the Managing Agent in the supervision of the execution of contractor/contractors obligations.
- 7] To assist in setting up the ITMIN methodological toolkit.
- 8] To assist in the establishment of a national policy regarding industrial market information.
- 9] To participate in the training of 20 information system managers and in the promotion seminars for 60 entrepreneurs, industrialists, managers etc. on the functioning of ITMIN and its service.
- 10] To prepare a demonstration of the ITMIN capability for the concerned organizations (e.g MIST, UNDP, and UNIDO Representatives) with the Managing Agent and network members operating ITMIN.
- 11] To participate in the periodical project performance evaluations.
- 12] To prepare a final report detailing the findings, evaluation and results of the project and recommendations on further action which might be taken.

**Qualifications**

University degree or equivalent in information science with extensive experience in industrial and market information systems. A strong business background and experience in managing large projects is highly preferred.

Language English

**SENIOR COUNTERPART STAFF\***

<b>N a m e</b>	<b>P o s i t i o n - f u n c t i o n</b>
Mr. S Khavan M Perera	Director/General Manager - Chief Executive Officer
Mr. Vijit Ratnarajah	Senior. Manager - Chief Operating Officer
Mr. Anura Gamage	Information Officer (Marketing) Assistant Manager
Mr. Sanath Senanayake	Information Officer (Library & Inquiries) - Assistant Manager
Mr. Fernando Rodrigo	Information Officer (Research & Value Added Services) - Senior Research Executive
Ms. Pamela Selvaratnam	Librarian - Senior Information Executive
Ms. Damayanthi Perera	Assistant Librarian - Information executive
Mr. Ifthicar Sadique	Information Officer - Information Officer

\* The persons listed above are the managers and staff members of GKCC/Infomart, managing ITMIN or working as ITMIN staff. Further counterparts are the members of the Board of Directors of ITMIN, who are also heads of the ITMIN nodes or their information units. Their names are given in Annex 3.

**Members of the Board of Directors of ITMIN Ltd'**

<b>Name</b>	<b>Affiliation</b>
Mr. Tissa Jayaweera (Chairman)	Chairman, Lanka Ceramic Ltd.
Mr. S. Khavan M Perera	Director/General Manager, The Golden Key Credit Card Company Ltd.
Mr. H. C. Peiris	Executive Director, Finance & Adm., Board of Investment of Sri Lanka
Mrs. G. I. Unamboowe	Director, Trade Information Services, Sri Lanka Export Development Board
Mr. L. G. Perera	Asst. General Manager, Small Enterprises Special Agricultural & Fisheries Project, Development Finance Corporation of Ceylon
Mr. J. Mohan Alles	Chief Executive Officer, Lanka Ventures Ltd.
Mr R. D. Gunapala	Manager SMI, National Development Bank of Sri Lanka
Dr. P. M. Jayatissa	Director, Ceylon Institute of Scientific & Industrial Research
Dr. A. M. Mubarak	Head, Instrument Centre, Ceylon Institute of Scientific & Industrial Research; Representative of the Ministry of Industrial Development

\* This list replaces the usual and always selective "List of people met". because in addition to Mr. Austin Perera, National Project Director, Secretary of the Ministry of Industrial Development, the members of the Board of Directors of ITMIN are the most significant people met.

## Work Plan

Activities	Completion By	Action By
2.1.1) Commencement of Project/ 2.1.2) Renovations to CISIR Library 2.1.4) building	Done	Board of Directors/FP team
2.1.3 (i) Selection of contractor to undertake renovation of CISIR premises (ii) Completion and handing over premises	Done 941201	Board of Directors Contractor
2.1.5 (i) Arrival of CTA (ii) Arrival of other experts, consultants	941126 Ref Annex 2	Board of Directors/UNIDO
3.1.1 To submit specification for a turn-key solution contract covering: (i) Computer hardware, software, telecommunication, CD-ROM server and Internet connectivity (ii) Shell software development (iii) Miscellaneous Focal Point equipment (copying machines, air conditioners, fax etc.) (iv) UPS, stabilizers	950201 950201 Done 950201	UNIDO/FP team UNIDO/FP team FP team UNIDO/FP team
3.1.2 To select a contractor for 3.1.1 (i), (ii) & (iv) and signing of agreement	950315	UNIDO/FP team
3.1.3 To set up a team of database application programmers	950315	UNIDO/FP team/contractor
3.1.4 To deliver and install items specified in 3.1.1 (i), (ii) & (iv)	950515	Contractor
3.1.5 To check out hardware and telecommunication equipment	950520	UNIDO/FP team
3.1.6 To establish (i) A list of CD-ROM databases to be purchased (ii) Subscription list of on-line databases/hosts (iii) A list of primary and secondary documents to be purchased	950215 950215 950215	UNIDO/FP team UNIDO/FP team UNIDO/FP team

Activities	Completion By	Action By
3.1.6 - continued - To establish (iv) A list of library furniture (eg: book racks, stands for periodicals, copying machine, binders, audio visual equipments, etc.	950215	UNIDO/FP team
3.1.7 To deliver the items specified in 3.1.6: (i), (ii), (iii) & (iv)	950430	Contractor
3.2.1 To establish the library	950515	UNIDO/FP team
3.2.2 To put into operation the Local Area Network (LAN)	950527	Contractor/UNIDO
3.2.3 To set up the co-operation with foreign information systems	950515	UNIDO/FP team
3.2.4 To install CD-ROM and other foreign/international databases	950527	UNIDO/FP team
3.2.5 To begin the initial phase of the FP operation	950601	FP team
3.3.1 To provide procedures and guidelines for computer hardware and telecommunication	950531	UNIDO/FP team
3.3.2 To determine and to set up linguistic tools	950420	UNIDO/FP team
3.3.3 To elaborate a set of manuals and user's guidelines on the usage of Focal Point databases	950831	UNIDO/FP team
3.3.4 To develop the ITMIN Payment Schemes	950415	UNIDO/FP team
3.3.5 To develop the FP databases along with accompanying software	950531	Contractor/UNIDO/FP team
3.3.6 To test the developed FP databases	950610	Contractor/UNIDO/FP team
3.4.1 To set up radio telecommuni- cation channel between the FP and service provider	950520	Contractor/FP team
3.4.2 To set up public telecommunication channels between the ITMIN nodes and service provider	951130	Contractor/FP team
3.4.3 To establish the FP databases	950630	UNIDO/FP team

Activities	Completion By	Action By
3.4.4 To operate all the Focal Point information services	960201	UNIDO/FP team
3.4.5 (i) To adapt software for the ITMIN nodal databases (ii) To connect nodes to ITMIN	951031 951130	Contractor/Nodes/FP team/UNIDO Contractor/Nodes/FP team/UNIDO
3.4.6 To test adapted software and the contents of nodal databases	951115	Contractor/Nodes/FP team
3.4.7 To convert/establish nodal databases	951130	Contractor/Nodes/FP team
3.4.8 To elaborate a set of manuals and user's guidelines (i) On the usage of nodal databases (ii) For the database administrator's team on nodal databases (iii) End user's guidelines on FP/nodal databases	951115 951115 960331	Contractor/Nodes/FP team/UNIDO Contractor/Nodes/FP team/UNIDO Contractor/Nodes/FP team/UNIDO
3.4.9 A demonstration of the ITMIN functioning, for the concerned organizations	960229	FP team/Nodes
3.4.10 Evaluation of ITMIN	960531	UNIDO/FP team
3.5.1 To select foreign institutions and organizations for training and study tours	950115	UNIDO/FP team
3.5.2 To provide international training for librarians, information officers and application programmers	950415	FP team
3.5.3 To provide on-the-job training for nodes of ITMIN	951231	UNIDO/FP team
3.5.4 To provide on-the-job training for database application programmers	951130	Contractor
3.5.5 To provide on-the-job training for information system Managers	960131	UNIDO/FP team
3.5.6 To provide on-the-job training for the ITMIN technical maintenance team	950531	Contractor

Activities	Completion By	Action By
3.5.7 To organize study tours in leading foreign institutions on advanced techniques in industrial and market information for ITMIN Managers (i) Covering 2 personnel (ii) Covering 3 personnel	950228 950831	UNIDO/FP team UNIDO/FP team
3.5.8 To organize seminars	960331	FP team

Bar chart for the Work Plan of the ITMIN Project

(The parties responsible for action are designated in coded form 1)

Activities and parties involved	94	1 9 9 5												1 9 9 6					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	
2.1.5 Arrival and stay of CTA & consultants 2 B/U					—x				—				—x						—x
		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....x	.....x	.....	.....	.....	.....x
3.1.1 Specify computer hardware, CD-ROM server, telecom., applic. softw. and miscell. items U/F		—x																	
3.1.2 Select contractor for items specified by 3.1.1 U/F		—	—x																
3.1.3 Set up database application, programmers team U/F/C			—	—x															
3.1.4 Deliver and install items as specified by 3.1.1 C				-----	-----x														
3.1.5 Check out hardware and telecommunication equipment U/F					---	---x													
3.1.6(1.i,ii). List of CD-ROMs, online databases, hosts for subscript. U/F		—	—x																
3.1.6( iii.iv). List of primary and sec. documents, libr. furniture U/F		—x																	
3.1.7 Deliver items specified by 3.1.6 (i,ii.) C			—	-----	-----x														



Activities and parties involved	94	1 9 9 5												1 9 9 6				
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
3.1.7 - continued. Deliver items specified by 3.1.6 (iii, iv) c				X														
3.2.1 Establish the library U/F						X												
3.2.2 Put into operation the Local Area Network (LAN) C/U					X													
3.2.3 Set up cooperation with foreign information systems U/F						X												
3.2.4 Install CD-ROM and other foreign/international databases U/F						X												
3.2.5 Begin the initial phase of the FP operations F						X												
3.3.1 Provide procedures, guidelines for computer hardware and telecom. U/F						X												
3.3.2 Determine and set up linguistic tools U/F					X													
3.3.3 Elaborate a set of manuals, users guidelines on use of FP dbases U/F									X									
3.3.4 Develop the ITRIN Payment Schemes U/F				X														

Activities and parties involved	94	1 9 9 5												1 9 9 6					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	
3.3.5 Develop the FP databases along with accompanying software C/U/F		-----X																	
3.3.6 Test the developed FP databases C/U/F						-X													
3.4.1 Set up radio tele-com. channel between FP and service provider C/F					-----X														
3.4.2 Set up public tele-com. channels betw. nodes and service provider C/F						-----X													
3.4.3 Establish the FP databases U/F						-----X													
3.4.4 Operate all the FP information services U/F															X				
3.4.5 (i) Adapt software for nodal databases C/N/F										-----X									
3.4.5 (ii) Connect nodes to ITMIN C/N/F/U																			
3.4.6 Test adapted software and contents of nodal databases C/N/F																			
3.4.7 Convert/establish nodal databases C/N/F																			
3.4.8 (i, ii) Elaborate set of manuals on the use and administr. of nodal databases C/N/F/U																			

Activities and parties involved	94	1 9 9 5												1 9 9 6					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	
3.4.8 (iii) Prepare end users guidelines on FP and nodal databases C/N/F/U																		X	
3.4.9 Demonstration of ITMIN functioning for organizations concerned F/N															X				
3.4.10 Evaluation of ITMIN U/F																			X
3.5.1 select foreign institutions for training, study tours U/F		X																	
3.5.2 Provide internat. training for librar., in-form. off., programmers F					X														
3.5.3 Provide on-the-job training for nodes of ITMIN U/F													X						
3.5.4 Provide on-the-job training for database applic. programmers C													X						
3.5.5 Provide on-the-job training for information system managers U/F														X					
3.5.6 Provide on-the-job training for ITMIN tech. maintenance team C						X													
3.5.7 Org. study tours in foreign instituts. for managers - 2 personnel - 3 personnel U/F			X							X									
3.5.8 Organize seminars F																		X	

1. Codes for the parties involved are:

- B - Board of directors
- C - Contractor
- F - Focal point team (Managing Agent)
- N - Nodes
- U - UNIDO (CTA & other experts)

2. Full line for the CTA, dotted line for the database expert and broken line for all other experts together

**Principles for the use of linguistic tools for ITMIN databases  
(an outline)**

The aim of the use of linguistic tools (information retrieval languages, classifications, indexing languages, in some cases: nomenclatures) is to make possible the retrieval of data by subject, with minimum loss and noise. Subject is interpreted here in a broad sense, e.g. the field of activity of a company, or the field of application of a technology are considered as subjects.

Based on a wide experience on the retrieval of data of integrated database systems, the following general scheme (list of tools to be used in parallel) is proposed:

- \* high level (general) classification schemes (nomenclatures) for the classification of activities and products
- \* thesaurus (controlled natural language vocabulary, with a developed system of relations/references between the terms/descriptors) on a macro level (see later)
- \* formalized but free keywords for the indexing of special, but significant concepts.

In addition to the above mentioned tools, the automatic indexing of free texts in the records/tables (making data retrievable by words of texts occurring in the data contents) can be used - harmonized with the use of free keywords.

**Classification schemes**

The use of the International Standard Industrial Classification of all Economic Activities (ISIC) and the use of the Standard International Trade Classification (SITC) is recommended for ITMIN. In the case of the classification of products, the use of the Harmonized Codes of the European Communities can also be considered to achieve compatibility with EDB. The decision should be based on the analysis of the schemes. Inquiries were made to prepare the ordering of the last editions of these tools.

In the case of bibliographic databases (catalogues) of the ITMIN Library the use of the Universal Decimal Classification (UDC) can also be considered, because ISIC and SITC will be applicable only for a smaller part of catalogue entries.

### Thesaurus

The use of an ITMIN Macrothesaurus is recommended. Macro means here the overall concept of the thesaurus, that it should not include very specific terms, e.g. it could include "spices", but not "ginger" or "cinnamon".

The ITMIN thesaurus can and should be based on the following thesauri:

- \* UNIDO Thesaurus of Industrial Development Terms,
- \* OECD Macrothesaurus,
- \* METI Thesaurus
- \* UNBIS Thesaurus.

One of the listed thesauri should be selected as the basic one and, if necessary, terms from other thesauri can be borrowed and included into the ITMIN Thesaurus, after thorough analysis of relations to be included. The ITMIN thesaurus should be stored in the computer and maintained by appropriate software. Three of the thesauri mentioned above are already available and the decision on their use will be based on their analysis.

### Free keywords

These are words or compound terms of the natural language which should be used in a formalized way (e.g. noun form, singular, natural sequence in the case of compound terms, etc.) They are used to make the data retrievable by special subjects, which are too specific for the inclusion to the Macrothesaurus. They should be used only, if the given term is not retrievable by free text search. Rules for their use should be prepared at a later stage.

The application of the linguistic tools needs a considerable knowledge. Therefore further conceptual and on-the-job training should be provided to the librarians and information officers.

Colombo, 16<sup>th</sup> April 1996

Erik I. Vajda

### Principles for the preparation of the ITMIN pricing schemes

ITMIN as a private public company strives not only for self-sustaining but for producing profits. This aim can only be achieved if the fees paid by its customers cover the direct and overhead costs of the preparation of services, as well as, the mark-up to be achieved. The structure of the ITMIN services will be sophisticated and it is impossible to calculate prices directly for all services. Sample aggregate prices can be used for marketing reasons, after gathering some experience.

Taking into account that the two major factors of providing services are the work of information officers and the use of the ITMIN computer system, the basic calculation should be based on the estimated productive working time of information officers and the estimated time of the productive use of the ITMIN computer system. All costs related to the work of the information officers (e.g. costs of information sources) should be considered as direct costs of their working time, whereas all costs of running the computer system, not excluding the costs of the establishment and updating of databases should be considered as direct costs of computer use. The calculated direct costs and overheads should be divided by the productive time to get the costs and (adding the mark-up) the prices for the unit of the work of information officers and for the unit of the use of computers.

All individual/special costs, e.g. costs of online retrieval, of document copying or even of the preparation of a market research report should bear their proportional overhead costs. Therefore the volume of such costs should be also estimated to define the distribution of overhead costs.

The prices, which are not based on the direct costs + overheads + mark-up scheme are prices of the type of provision, e.g. success fees for technology transfer, as well as the prices for recurring services (e.g. e-mail).

It follows from the above principles that the online use of the ITMIN computer system will have a simple price structure, because the only factor will be the pre-defined price of the use of computer time. It can be decided later on, whether the price should be calculated only for connect time, or for connect time and CPU time or even for the use of databases.

In the case of enquiries and related services the information officer has to estimate the individual factors: the use of information officers' work time, the use of computer-time and the individual costs. On this basis a price should be offered. It should be agreed that the user accepts the bill if the price is

equal to the offer +/- 20 % If the deviation will be higher the user has to be asked to accept it and if he withdraws his inquiry he has to pay only a flat handling fee.

A similar pattern should be followed for individual, e.g. follow-up services, although in this case the majority of costs will be individual costs, which can be estimated easier or are even known in advance.

Colombo, 18<sup>th</sup> April 1996

Erik I. Vajda



# WHAT IS ITMIN AND HOW DOES IT WORK ?

Presented by Erik I. Vajda

Chief Technical Adviser

## ITMIN - AN INFORMATION SERVICE PROVIDER AND BROKER

THE USERS

THE PRINCIPLES OF SERVICING AND BROKERAGE

THE SERVICES

THE SOURCES AND TOOLS

ADDITIONAL ACTIVITIES

## ITMIN - A NETWORK OF COMPUTERS AND SERVICE PROVIDERS

FOCAL POINT AND NODES

WORK SHARING PRINCIPLES

FINANCIAL PRINCIPLES

ADVANTAGES FOR NODES

## ITMIN'S PRICES AND PROFITS

CHARGING FOR INFORMATION - A CHALLENGE  
ON SELF SUSTAINABILITY AND PROFITABILITY

PRICING STRUCTURE - EXTERNAL/INTERNAL PRICES

RISKS AND PROBABILITIES

**Proposal on the establishment of an "Information Sources Toolkit" for information oriented field projects**

All CTA-s, or Industrial Information Advisers dealing with field projects for the establishment or strengthening industrial, technological etc. information services and networks, as well as, their national counterparts have to select information sources (databases, primary and secondary documents). This is normally done in a disastrous and time consuming way, because the relevant sources are not available. Therefore I propose, that INTIB (being now the "master" of all information-oriented projects) should establish and regularly update an "Information Sources Kit" consisting of the following (obviously the latest edition and/or an updated version should be included/modified):

- \* Books in Print Plus (CD-ROM; current number in the 1993 CD-ROM directory, hereinafter CDDN: 3161)
- \* Bookbank (CD-ROM; CDDN: 3153)
- \* Électre-Biblio (French Books in Print) - only for projects in French speaking countries (CD-ROM; CDDN: 3895)
- \* Ulrichs Plus (a world periodical/serial directory; CD-ROM; CDDN: 5782)
- \* The CD-ROM Directory ON DISC (CD-ROM; CDDN: 3417)
- \* Gale Directory of Databases, or other directory of online accessible databases (a far as I know, no CD-ROM version exists; therefore the printed version).
- \* The up-to-date list (or the basic list(s) with updates) of UNIDO documents,
- \* A list of available (online, on floppies etc.) UNIDO databases,
- \* A worldwide and a regional address/access list and short description of UN funded or supported, operational industrial/technological information services (e. g. TIPS, APCTT/METI/INTET),
- \* The most important classifications (ISIC, IPC) and thesauri for industrial information (UNIDO, METI, OECD Macrothesaurus, UNBIS).

Of course, the preparation and updating of such a kit costs time and money, but if all projects have to acquire this information this costs still much more, if feasible at all.

Only one kit should be established for all information related projects, and this should be given for the CTAs (IIAs) for not more than four weeks but the classifications and thesauri should be given to the projects preferably finally. The majority of these tools will require the use of a CD-ROM drive and of an appropriate PC, but this is needed anyway; a project cannot be effectively started without a minimum of office equipment available, what should be clarified with the national counterparts.

The costs of the use of such a kit could be reimbursed by UNIDO from the "miscellaneous" or other budget lines of each project concerned.

Erik I. Vajda

CTA, ITMIN Project.

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