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ESTABLISHMENT OF INDUSTRIAL TECHNOLOGY AND MARKET INFORMATION NETWORK (ITMIN)

DG/SRL/93/010/11-53

SRI LANKA

Technical report: ITMIN Data Model (second mission)

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 M. Muraszkiewicz
Consultant on Information Systems Management

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Vienna

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EXPLANATORY NOTES

Currency

According to the UN operational rate 1 US dollar is equivalent to 50.00 Rupees of Sri Lanka.

Main Abbreviations

CTA	Chief Technical Adviser
CISIR	Ceylon Institute of Scientific and Industrial Research
DTP	Desk Top Publishing
E-R	Entity-Relationship
FP	Focal Point
HTML	HyperText Markup Language
HTTP	HyperText Transport Protocol
INTIB	Industrial Technology Information Bank (operated by UNIDO)
ITMIN	Industrial, Technology and Market Information Network
LAN	Local Area Network
NOS	Network Operating System
PPP	Point-to-Point Protocol
SEARCC	South East Asia Regional Computer Confederation
SLIP	Serial Line Internet Protocol
SME(I)	Small and medium Enterprises (Industries)
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
USD	United States Dollar
WWW	World Wide Web

ABSTRACT

Author: M. Muraszkiewicz
Corporate author: UNIDO
Title of project: Establishment of Industrial Technology and Market Information Network (ITMIN)
Number of project: DG/SRL/93/010/11-53
Title of report: ITMIN Data Model (second mission)
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This document is a technical report on the activities and outputs achieved by Consultant 11-53 during the second part of a split mission to ITMIN Ltd., Colombo, Sri Lanka (23 August - 20 September, 1995).

The main outcomes of Consultant's work are the ITMIN data model and specification of fields (prepared jointly with Mr. E. Vajda, CTA), technical specification of the ITMIN database software to be developed by the contractor, and further elaboration of the accessing mechanism to the ITMIN computerized resources and ITMIN FP computing architecture.

Documents enclosed in Appendices 1, 2, 3 and 4 present these issues in detail.

1. INTRODUCTION

Objective

The mission in Colombo lasted from 23 August through 20 September 1995. The continuation of the assignment is scheduled for the first quarter of the next year. The Consultant was attached to ITMIN Ltd. in Colombo.

The main objectives of the assignment were: (i) to assist and participate in the information technology processes started already in ITMIN Ltd. such as identification of information sources; setting up the ITMIN data model, and refinements of the contract with the ITMIN database software developer; (ii) to examine and further elaborate on the ITMIN FP computing architecture; (iii) provide training to the ITMIN staff on designing databases, the ITMIN data model and introductory issues related to the Internet.

All the objectives were reached.

Background

The rationale for ITMIN was broadly presented in the ITMIN Feasibility Study [FST,1992] and in the Project Document [PRD,1994] approved by the concerned parties. New elements strengthening the business orientation of ITMIN were identified and proposed in [MUR,1995]. The summary of the ITMIN implementation issues until April 1995 is given in the report by Mr. E. Vajda ,CTA [VAJ,1995].

Acknowledgments

A great deal of very helpful opinions and suggestions, and valuable contributions were received from the UNIDO and counterpart experts. The consultant is indebted to all of them and expresses his gratitude for their contribution to his work.

2. RECOMMENDATIONS

To ITMIN Ltd.

1. To finalize the contract with the Foundation for Advanced Computer Studies regarding the development of the ITMIN database software and shell.

2. To purchase Windows for Workgroups and to install it on the LAN.

3. To acquire and install a terminal server and a router (connected to the IBM RS/6000 machine) according to the specification by Mr. M. Graff.

4. To identify and train the administrator of the whole ITMIN hardware network.

5. To train the ITMIN staff (2-3 persons) in the INTERNET operation and in using WWW. Special stress has to be put on the skills necessary to create HTML (Hyper Text Markup Language) documents.

6. To set up subscribing/membership and pricing policy.

7. To apply to the Sri Lankan telecommunication authorities for a license allowing ITMIN to provide the subscribers with the Internet services, in particular on the basis of SLIP/PPP.

8. To elaborate the data acquisition procedures and to commence the data acquisition.

9. To identify and acquire an accounting software package for running the whole ITMIN FP bookkeeping. Then to start implementing the ITMIN FP accounting system under this software. To this end, the Concorde package is a serious candidate.

To UNIDO

1. To set up the INTERNET module within the "Front-End Processor" (IBM RS/6000) and to assist in connecting it to Sri Lanka TELECOM.

2. To clarify the functions of the billing program (counting the statistics realted to the remote useres work) to be set up on the IBM RS/6000 computer.

3. ACTIVITIES

1. Analysis of the ITMIN computing architecture was carried out.

2. Work on the accounting formula related to the work of the ITMIN information officers was performed.

3. The work on data model of an accounting database for registering the work of information officers was carried out. The programming team was briefed on the ITMIN architecture and instructed as far as this accounting module was concerned.

4. The Concorde accounting package was analyzed as a candidate for implementing the whole ITMIN FP bookkeeping system.

5. Work on the ITMIN data mode with Mr. E. Vajda was carried out

6. Discussions with Mr. V. Ratnarajah and Mr. E. Vajda on the data acquisition procedures and information sources were held.

7. A specification of the DOS/UNIX version of the ITMIN software and shell for the contractor (Foundation of Advanced Computer Studies) was prepared.

8. Technical discussions with the representatives of IBM and Mr. M. Graff during the acceptance test were held.

9. Technical issues with Mr. G.A.D. Silva, Deputy General Manager, Sri Lanka Telecom, on the requirements related to connecting the Internet module to be put on the IBM RS/6000 computer with SL Telecom were discussed.

10. A speech to the ITMIN Directors (members of the Board) on the access modes was prepared.

11. A discussion on upgrading the node located at CISIR with Dr. A. Mubarak, CISIR, Member of ITMIN Board was held.

12. Short training on the database designing and ITMIN data model was delivered to 8 ITMIN staff members.

13. An introductory course on the Internet was delivered to 8 ITMIN staff members.

14. A visit to the SEARCC'95 information technology exhibition was paid.

4. OUTPUTS

1. The analysis of the ITMIN computing architecture, including access modes and a taxonomy of users. See Annex 4.

2. An accounting formula related to the work of the ITMIN information officers. See Annex 2.

3. The data model of an accounting database for registering the work of information officers.

   Note: The prototype of the accounting module to be used for registering the workload and resources used by the information officers for processing the customers' queries will be developed on the RS 6000 computer. However, the final location of this module will be determined later on.

4. The programming team briefed on the ITMIN architecture and instructed as far as the accounting module implementation was concerned. The team started the work.

5. The ITMIN data model (E-R chart and Field Descriptions). See Annex 1.

6. A specification of the DOS/UNIX version of the ITMIN software and shell delivered to the contractor (Foundation of Advanced Computer Studies) was prepared.

7. Technical issues with Mr. G.A.D. Silva, Deputy General Manager, Sri Lanka Telecom, on the requirements related to connecting the Internet module to be put on the IBM RS/6000 computer with SL Telecom were discussed. For details see Annex 3.

8. A speech to the ITMIN Directoris on the ITMIN access modes delivered (see Annex 4).

9. A concept of upgrading the node located at CISIR developed. The chief elements of the upgrading strategy are as follows:

   * establishment of a multi-user full-fledged computerized library system operating on LAN and connected to ITMIN, whose dialog interface will be compatible with the ITMIN systems;

   * setting up an on-line catalogue of the CISIR library accessible via the Internet;

   * defining the CISIR home pages (HTML), implementing them on the WWW server and making available to the Internet users.

10. Short training on the database designing and ITMIN data model to 8 ITMIN staff members delivered.

11. An introductory course on the Internet to 8 ITMIN staff members delivered.

5. REFERENCES

[FST,1992] Industrial Technology and Market Information Network (ITMIN), DP/SRL/91/007, *Feasibility Study*, Colombo, Sept., 1992 (available at UNIDO).

[MUR,1995] Muraszkiewicz M., Business and Communication Aspects of ITMIN; Strategies for Providing ITMIN with the Internet Services [in:] *Technical Report*, First mission of the Consultant), March 2, 1995.

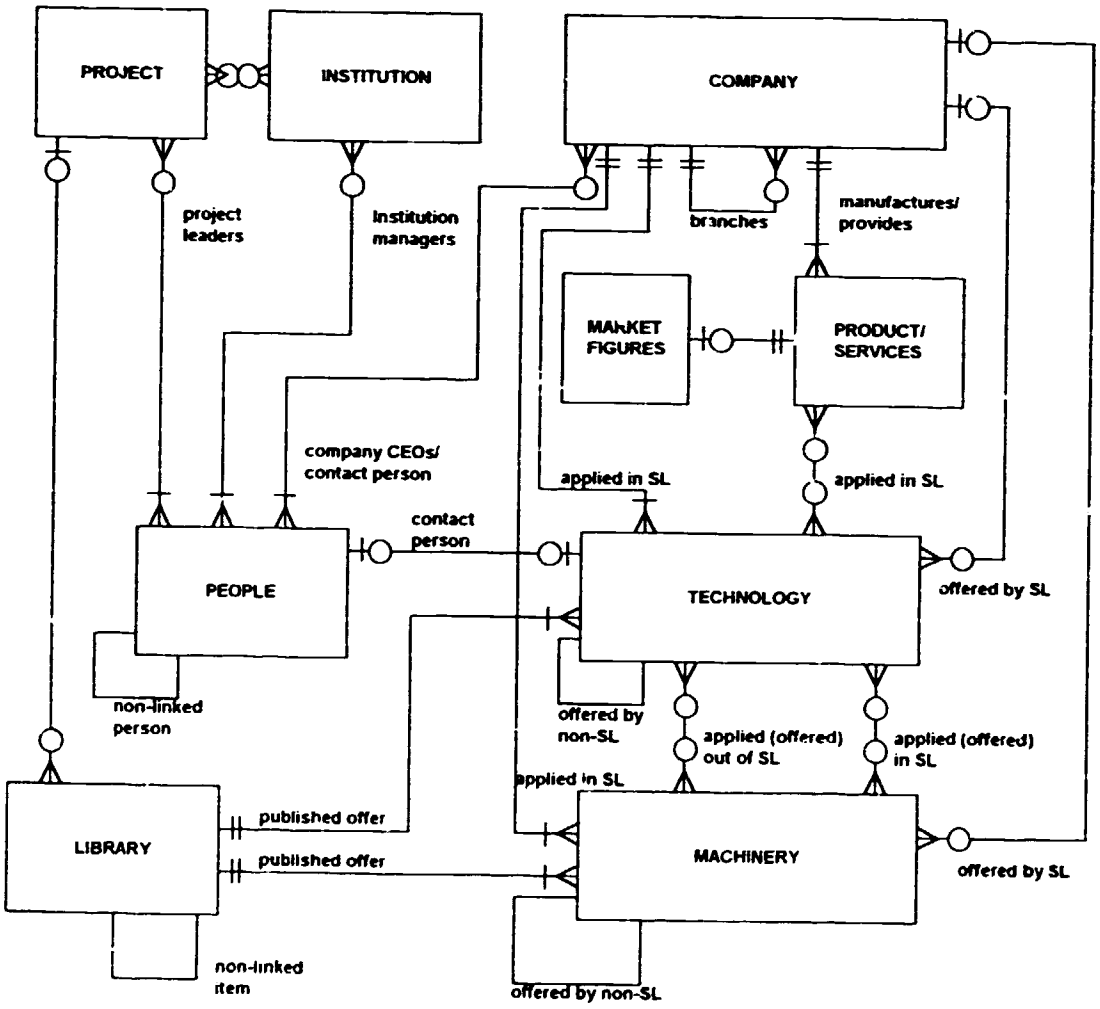
[PRD,1994] Industrial Technology and Market Information Network (ITMIN), *Project* Document, DG/SRL/93/010, Colombo, 1994.

[VAJ,1995] Vajda E., Starting the Establishment of ITMIN (First mission of the CTA), *Technical Report*, April 20, 1995.

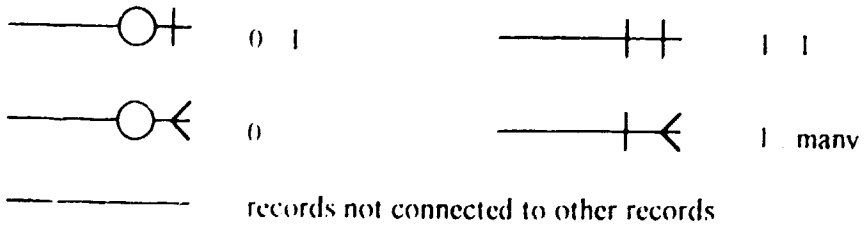
ANNEX 1. DATA MODEL

Project Name:	New Project Name
Project Path:	c:\ecwin\omega\
Chart File:	erd00001.erd
Chart Name:	itmin.erd
Created On:	Sep-07-1995
Created By:	MRM
Modified On:	Sep-15-1995
Modified By:	MRM

ENTITY-RELATIONSHIP ITMIN DATA MODEL, VER.3



The above chart uses Martin's convention for doing the Entity-Relationship (E-R) data models. Boxes represent entities (object types) whereas lines show the relationships between the entities. The cardinality of the relations is coded as follows:



working material, version 2.0

ITMIN DATA MODEL

prepared by

M. Muraszkiewicz, E. I. Vajda

The document contains the ITMIN data model in terms of field description, and some hints on its implementation.

CONVENTIONS

Column codes

Mnd	-	mandatory field
Rep	-	repeatable field
L-up	-	look-up table attached to the field
Retv	-	retrievable field through an index
Unq	-	unique
Pr	-	form of presentation (CDD - coded, CVD - from controlled vocabulary/set, given in the data model, CVT - from controlled vocabulary/set, not given in the data model, FN - free numeric, FT - free text, LV - linked value, SN - standardized, numeric, ST - standardized text)
Pr| or |	-	Data preceeded by this sign are given in the "Fields column but they are codes or other rules for presentation

table, end table - table structure of data

Links between record types are explcitly displayed in the E-R datamodel attached.

DESCRIPTION OF DATA FIELDS

***** GENERAL HEADER *****

Note: applies to each record type.

Field	Mnd	Rep	L-up	Retv	Unq	Pr
RECORD IDENTIFIER	+			+	+	SN
DATE ENTERED	+					SN
DATE MODIFIED		+				SN
ENTERED BY		+	+	+		CVT
MODIFIED BY	+	+	+			CVT
VALIDATED BY	+	+	+			CVT
SOURCE (DATABASE)						
NAME						
DATE OF SOURCE RECORD						
ID. NO. OF SOURCE RECORD						

Field	Mnd	Rep	L-up	Retv	Unq	Pr
RECORD STATUS	+		+	+		CVD
|new-not completed (NNC)						
|new-not validated (NNV)						
|new-validated (NVL)						
|modified-not validated (MNV)						
|modified-validated (MVL)						
|logically deleted (LDL)						
DATE OF INFO COLLECTION	+					SN
VALID OVER PERIOD	+			+		SN
MONITORING DATE	+			+		SN
(to be used by a batch program prompting for update)						

COMPANY (domestic)

********** General Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME	+		+	+		FT
ABBREVIATED NAME						
ADDRESS						
NUMBER AND STREET	+					ST
CITY	+		+			FT
STATE						FT
ZIP/POSTAL CODE						SN
COUNTRY	+		+			CVT
P.O.BOX						SN
TELEPHONE						SN
FAX						SN
E-MAIL						ST

Note: This applies to other address blocks referred to as standard format

BRANCHES AND THEIR ADDRESSES						
NAME OF BRANCH		+				FT
ABBREVIATED NAME		+				FT
ADDRESS (standard format)						
REGISTERED COMPANY NUMBER	+				+	SN
REGISTERING OFFICE	+					FT
YEAR OF ESTABLISHMENT	+					SN
DESCRIPTION OF BUSINESS	+					FT
DESCRIPTORS	+	+	+	+		CVT
KEYWORDS		+	+	+		FT
ISIC	+	+	+	+		CDD
TYPE OF ACTIVITY *[V.R.]*	+	+	+		+	CVD
manufacturing						
engineering - design						
trading, exporter						
trading, importer						
agent						
wholesaler						
retailer						
consulting						
service provider						
...						
others						
TOTAL NUMBER OF SHAREHOLDERS						FN
EMPLOYEE TOTAL	+					FN
ANNUAL SALES TOTAL						FN
EXPORT MARKETS						LV

Note: link to MARKET FIGURES; list should be given explicitly.

IMPORT MARKETS	LV

Note: link to MARKET FIGURES; list should be given explicitly.

********* Banking/Legal Section ********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME OF BANK(S) WITH FUNCTION		+				
ACCOUNTING FIRM(S)		+				
LAWYER(S), LAW FIRM(S)		+	+			
IS A SUBSIDIARY OF						LV
Note: link to COMPANY						
LEGAL STATUS *[V.R.]*	+	+	+	+		CVD
|private						
|semi-private						
|public						
|municipal/local						
|NGO						
|...						
|others						
OWNERSHIP STRUCTURE - *[LIABILITY*	+	+				CVD
V.R.] |joint venture						
|shareholding						
|proprietorship						
|partnership						
|corporation						
|...						
|others						
MAIN SHAREHOLDERS NAMES		+				FT

********** Financial Section *********

Preliminary proposal. Probably, it has to be devised separately for the various legal statuses. *[V.R.]*.

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
	Date Year 1	DateYear 2	DateYear 3			
FISCAL YEAR END						
SALES (turnover)						SN
PROFIT						SN
FIXED ASSETS						SN
CURRENT LIABILITIES						SN
CURRENT ASSETS						SN
SHAREHOLDERS FUNDS						SN
CAPITAL EMPLOYED						SN
RETURN ON TURNOVER						SN
RETURN ON CAPITAL						SN
...						
end table						

********** Stock Exchange Section ********

Rough proposal *[V.R.]*

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME OF PRIMARY STOCK EXCHANGE						FT
NAME(S) OF SECOND. STOCK EXCH.		+				FT
STOCKHOLDERS *(ANONYM ?)*						FT
DIVIDENDS						SN
UNITS OFFERED						SN
TRANSFER AGENT & REGISTRAR						FT
STOCK PRICE *nominal? updated?*						SN

...

********** Product/Service Section ********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
PRIMARY PRODUCT/SERVICE NAME	+		+			T or LV
Note: link to PRODUCT/SERVICE						
SITC	+			+		LV
SECONDARY PRODUCTS NAMES		+	+			LV
Note: link to PRODUCT/SERVICE						
SEC. SITCs		+		+		LV
MARKET FIGURES		+				SN
Note: link to MARKET FIGURES through PRODUCT/SERVICE						

********** Machinery Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
MACHINERY NAME		+	+			LV
Note: link to MACHINERY						

******** Executives/Contacts Section *********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
NAME OF EXECUTIVE	+					
POST	+					
TELEPHONE						
end						
Note: link to PEOPLE (EXPERTS+WHO'S WHO)						
INFORMATION CONTACT PERSON						
NAME	+					ST
DESIGNATION						FT
ADDRESS (if different from above; standard format)						
Note: link to PEOPLE, if a person is SL; otherwise fill out						

********** News/Events Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
DATE						FT
TEXT OF NEWS						FT
end table						

Example:

DATE	TEXT OF NEWS
06 Mar 95	Subsidiary Agrees to Sell Phases I and II of Industrial Park
12 Sept 94	Interim Consol. Earns.: Sept. '94

******** Remarks Section *********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
REMARKS		+				FT

PEOPLE (domestic, international)

********** General section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME	+				+	ST
DATE OF BIRTH	+					SN
SEX	+					CVT
NATIONALITY	+		+			CVT
Note: The default value is the three character ISO code of Sri Lanka						
RESIDENCE ADDRESS (standard format)						
FLAG FOR EXPERTS				+		CD
FLAG FOR WHO IS WHO				+		CD
Note: The default value is Y						
AVAILABILITY		+				CVD
|short term assignments						
|medium term assignments						
|long term assignments						
|full time						
|part time						
...						
|others						

********** Affiliation **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
PRIMARY AFFILIATION						FT
PRIMARY AFFILIATION ADDRESS (standard format)						
Note: link to COMPANY/INSTITUTIONS						

Field	Mnd	Rep	L-up	Retv	Unq	Pr
PRIMARY AFFILIATION POSITION						FT
table						
SECONDARY AFFILIATIONS						FT
SECONDARY AFFILIATION POSITIONS						FT
end table						
table						
GRADUATED FROM						
NAME OF INSTITUTION						FT
YEAR						SN
DEGREE/TITLE			+			CVT
end table						

********** Qualifications & Experience *******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
SPECIALIZATION						
DESCRIPTION						FT
DESCRT	+	+		+		CVT
ISIC		+	+		+	CDD
table						
PROFESSIONAL EXPERIENCE						
EMPLOYER						ST
ACTIVITY						FT
PERIOD (starting/ending year)						SN
end table						
LANGUAGES	+	+	+	+		CVT
MAIN ACHIEVEMENTS						FT
table						
MEMBERSHIP						
ORGANIZATION NAME						FT
POSITION						FT
end table						
PUBLICATIONS						FT

********** Other **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
SHORT CV (free text for WHO'S WHO)						FT
HOBBIES (for WHO'S WHO)		+	+			FT
REMARKS						FT

PRODUCT/SERVICE (domestic)

********** General Characteristic **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
FLAG FOR ITEM	+		+	+		CDD
Note: P or S; by default P						
PRODUCT/SERVICE NAME	+		+	+		FT
SITC	+		+	+		CDD
ISIC	+		+	+		CDD
MARKET NAME (BRAND NAME)/TYPE				+		FT
PRODUCT/SERVICE APPLICATIONS/USES		+				FT
SPECIAL CHARACTERISTICS						FT
PRODUCT/SERVICE OFFERED						
Note: link to COMPANY						
MARKETS						
Note: link to MARKET FIGURES						

********* Features ********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
RAW MATERIALS		+	+			FT
PACKAGING		+	+			FT
QUALITY STANDARDS APPLIED		+				ST
INDICATIVE PRICE (FOB/CIF)						
PRICE						SN
CURRENCY (if not SLR)						CDD
TRANSPORT REQUIREMENTS						FT
IMPORT TARIFFS & TAXES						SN
REMARKS						

MARKET FIGURES (domestic)

Field	Mnd	Rep	L-up	Retv	Unq	Pr
PRODUCT/SERVICE CODE (SITC or ISIC)	+	+		+		CDD
Note: link to PRODUCT/SERVICE and to COMPANY through PRODUCT/SERVICE						
PRODUCT/SERVICE NAME	+		+	+		FT
EXPORT/IMPORT/DOMESTIC	+	+		+		

table

COUNTRY_OF_EXPORT	EXPORT_VOL. (QNTY)	EXPORT_SALES (in Rs and $)
COUNTRY_OF_IMPORT	IMPORT_VOL. (QNTY)	IMPORT_SALES (in Rs and $)
DOMESTIC	SALES_VOL (QNTY)	SALES (in Rs)

end table

REMARKS FT

TECHNOLOGY (domestic and international)

Field	Mnd	Rep	L-up	Retv	Unq	Pr
OFFER/REQEST FLAG	+			+		CDD
Note: by default O						
REQUEST STATUS FLAG			+	+		CDD
|fullfilled						
|pending						
|canceled						
Note: by default "pending"						
NAME (DESIGNATION)	+			+		FT
DESCRIPTION	+					FT
AREAS OF APPLICATION						FT
ADVANTAGES		+	+			CVT
ENVIRONMENTAL ASPERCTS						FT
DESCRIPTORS						
ON BROAD AREA		+	+	+		CVT
ON RAW MATERIAL		+	+	+		CVT
ON PRODUCT/SERVICE/PROCESS	+	+	+	+		CVT
ISIC	+	+	+	+		CDD
SITC		+	+	+		CDD
PRODUCTS OBTAINED	Note: link to PRODUCT/SERVICE					
STAGE OF DEVELOPMENT	+	+	+	+		CVD
|idea						
|design						
|feasibility study						
|laboratory model						
|prototype						
|pre-series						
|pilct plant						
|launch phase						
|commercialized						
|patented						

******* Economic Data (USD) ********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
TOTAL PROJECT COST						SN
MACHINERY/EQUIPMENT COST (FOB)						SN
OPERATIONAL COST/YEAR						SN
KNOW-HOW FEE						SN
LICENSE FEE						SN
TRAINING FEE						SN
PAYBACK PERIOD						SN
MARKETING MODE		+	+			
|buy-back						
|licensor assistance						
|by licensee						

********** Owner/Seeker reference *********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
OWNER/SEEKER	+	+				ST
Note: link to COMPANY, if Sri Lankan, in this case identical company data below need not to be entered						
ADDRESS (standard format)						
CONTACT PERSON						
NAME	+					ST
Note: link to PEOPLE, if a person is SL; otherwise fill out						
DESIGNATION						FT
ADDRESS (if different from above; standard format)						
TURNOVER (USD)						SN
EXPORT (USD)						SN
IMPORT (USD)						SN
NUMBER OF EMPLOYFES						SN
YEAR OF ESTABLISHMENT						SN
BANK REFERENCE		+				FT

********** Production/Application Details **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
PRODUCTION CAPACITY						FT
INPUTS REQUIRED						
BUILDING						FT
POWER/FUEL						ST
WATER						ST
LAND						ST
RAW MATERIALS						FT
OTHERS						FT
MANPOWER NEEDED						
SKILLED						SN
UNSKILLED						SN
TECHNICIANS						SN
TOTAL						SN

********Transfer Details********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
TRANSFER TERMS		+	+	+		CVD
joint venture						
manufacturing license						
patent for sale (license)						
know-how						
design						
training						
consultancy						
productiong equipment						
technical assistance						
subcontracting						
distribution license						
agency license						
turn-key						
others (specify)						

```
table
PATENT DETAILS (country, date,title
            registration number)          +                    ST
end table
REMARKS
```

MACHINERY/EQUIPMENT (domestic, international)

********** General Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME (DESIGNATION)	+		+	+		FT
MAKE, TYPE	+			+		ST
DESCRIPTORS	+	+	+	+		CVT
KEYWORDS		+	+	+		ST
ISIC	+		+	+		CDD
NOTES ON USAGE, SPECIAL CHARACTERISTICS						FT
OWNER/TRADER NAME	+	+				ST
Note: link to COMPANY, if SL						
ADDRESS (standard format)						

******** Technical/Commercial Section ******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
WORKING CAPACITY						FT
POWER REQUIRED						SN
SPACE REQUIRED						SN
OTHER TECHNICAL PARAMETERS						FT
PRICE (FOB)						
AMOUNT						FN
CURRENCY						CDD
SPECIAL SALES CONDITIONS						FT
REMARKS						FT

PROJECT (domestic)

********** General Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
TITLE (NAME) OF PROJECT	+			+		FT
DESCRIPTION	+			+		FT
ISIC	+	+		+		CDD
SITC	+	+		+		CDD
DESCRIPTORS	+	+	+	+		CVT
STATUS	+		+			CVD
|proposed, not approved yet						
|approved, not started yet						
|ongoing						
|completed						
|stopped						
PROJECT TYPE	+	+	+	+		CVD
|research						
|development						
|investment						
|technology transfer						
|...						
|other						
TOTAL BUDGET						SN
CURRENCY						CD
STARTING DATE (FACTUAL)						SN
COMPLETION DATE (PLANNED)						SN
COMPLETION DATE (FACTUAL)						SN
PROJECT SITE (address, other info)						FT

********* Institutions/Companies Involved Section ******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
NAME OF FUNDING BODY						ST
ADDRESS (standard data)						ST
CONTACT PERSON						ST
end table						
table						
NAME OF EXECUTING BODY						ST
ADDRESS (standard data)						ST
CONTACT PERSON						ST
end						

********** Project People Section ********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
PROJECT LEADER'S NAME	+		+	+		ST
DESIGNATION	+					FT
AFFILIATION						FT
Note: link to PEOPLE						
end table						
table						
PROJECT_TEAM_MEMBER						
NAME			*			ST
DESIGNATION						FT
AFFILIATION						FT
Note: link to PEOPLE						
end table						
table						
REFERENCE TO REPORT						
TITLE						FT
Note: link to LIBRARY						
end table						
REMARKS						

BUSINESS AND TECHNOLOGY INSTITUTIONS (domestic)

********** General Section **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAME	+			+		ST
ABBREVIATION				+		FT
ADDRESS (standard format)						
REGISTRATION NUMBER						FN
YEAR OF ESTABLISHMENT	+					SN
DESCRIPTION OF ACTIVITIES	+					FT
DESCRIPTORS	+	+	+	+		CVT
KEYWORDS		+	+	+		ST
ISIC	+	+	+	+		CDD
TYPE OF INSTITUTION	+	+	+	+	+	CVD
|R+D						
|educational						
|consulting						
|media						
|association						
|engineering						
|trade union						
|chamber of commerce						
|library						
|museum						
|information center						
|...						
|others						
LEGAL STATUS						CVD
|public						
|municipal/local						
|NGO						
|association						
|...						
|others						
EMPLOYEE TOTAL						SN
ANNUAL BUDGET						SN
INSTITUTIONAL MEMBERSHIP						SN
INDIVIDUAL MEMBERSHIP						SN
Note:Link to PROJECT						

********* Executives Section *********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
table						
NAME OF EXECUTIVE	+					ST
DESIGNATION	+		+			FT
|chairman						
|president						
|director						
|general manager						
TELEPHONE (if not the same as above)						SN
end						
PROJECT(S)		+	+			
Note: link to PEOPLE						

********** News/Events **********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
DATE		+				FT
TEXT OF NEWS		+				FT

end table

A list of selected news/events according to the format:-

DATE	TEXT OF NEWS
06 Mar 95	New Laboratory for testing materials opened and activities demonstrated to the public
12 Sept 94	Board meeting discussed development of computer applications

REMARKS

LIBRARY

Explanation

The ITMIN library database serves as

* a library catalogue of physical items (monographs and serials) in the holdings of the ITMIN Library;
* a retrieval tool for selected analytical items (e.g. articles of periodicals, parts of books) forming parts of physical items in the holdings of the ITMIN Library;
* a retrieval tool for publications referred to in various sources and found useful for inclusion into the ITMIN library database(s).

If the source of information was any document in the holdings of the ITMIN library but the given source contains information which by subject (type) should be accomodated in any of the other, not library ITMIN databases, too (news/descriptions of available technologies or machinery in periodicals, catalogues etc. or reports on projects) the given information should be recorded in the database to which it belongs by its subject/type and a link has to be established between the records in the Technology, Machinery or Project databases and the Library database.

*******General/coded data*******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
TYPE OF ITEM	+			+		CD
ELE - electronic document						
MON - monograph						
PAT - patent document						
PMON - part of monograph						
PER - periodical						
PPER - part of periodical						
REP - report						
STN - standard						
LANGUAGE OF ITEM						CD
Remark: only if other than English						
AVAILABILITY OF BACKGROUND DOCUMENT						CD
ITM - own collec tion						
CIS - CISIR Library						
NOD - other nodes						
...						

********Identification numbers********

Field	Mnd	Rep	L-up	Retv	Unq	Pr
ISBN						
NUMBER		+		+	+	SN
QUALIFIER						FT
ISSN				+	+	SN
R & D NUMBERS						
REPORT NUMBER		+		+	+	FN
PROJECT NUMBER	[Link to PROJECT]					
CALL NUMBER						
LIBRARY CALL NUMBER					+	SN
STORAGE IDENTIFIER						SN
ACCESSION NUMBER					+	SN
SCANNEDS RECORD IDENTIFIER					+	SN

*******Bibliographic data*******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
TITLE						
TITLE OF TARGET ITEM	+			+		ST
TITLE OF HOST ITEM						ST
EDITION STATEMENT						ST
NAME(S) OF PERSON(S)						
Table						
NAME(S) FOR TARGET ITEM			+	+		ST
ROLE						ST
AFFILIATION						FT
end table						
Table						
NAME(S) FOR HOST ITEM		+				ST
ROLE		+				ST
end table						
NAME(S) OF CORPORATE BODY(IES)						
Table						
NAME(S) FOR TARGET ITEM		+	+	+		ST
ROLE		+				ST
ADDRESS		+				FT
end table						
Table						
NAME(S) FOR HOST ITEM		+				ST
ROLE		+				ST
end table						
MEETING DATA						
NAME OF MEETING			+	+		ST
PLACE OF MEETING				+		ST
DATE OF MEETING				+		SN

PERSONS ASSOCIATED WITH PROJECTS (ONLY REPORTS)
[Link to PEOPLE from where one can see a link to PROJECT]

File:DATAMOD.DIS

H20

Field	Mnd	Rep	L-up	Retv	Unq	Pr
NAMES ASSOCIATED WITH PATENTS						
Table						
PATENTEE (ASSIGNEE)		+	+			ST
ADDRESS OF PATENTEE		+				ST
End table						
INVENTOR		+				ST
APPLICANT		+				ST
PROJECT INSTITUTIONS						
[Link to INSTITUTION/COMPANY from where one can see a link to PROJECT]						
PROJECT DATES						
[LINK TO PROJECT]						
IMPRINT DATA AND SERIAL NUMBERING						
YEAR OF PUBLICATION	+			+		SN
PLACE OF PUBLICATION						ST
COUNTRY OF PUBLICATION				+		CD
DATE OF HOST SERIAL ISSUE						SN
VOLUME AND ISSUE NUMBER OF HOST SERIAL						SN
STANDARDS' VALIDITY DATES						
STARTING DATE OF VALIDITY						SN
WITHDRAWAL DATE						SN
DATE OF EXPIRY OF VALIDITY						SN
SOURCE						ST
PHYSICAL DESCRIPTION						ST+SN
PRICE						SN
NOTES						FT

*******Classification/indexing data******

Field	Mnd	Rep	L-up	Retv	Unq	Pr
ISIC		+	+	+		CVT
SITC		+	+	+		CVT
UDC	+	+	+	+		CVT
DESCRIPTORS	+	+	+	+		CVT
KEYWORDS		+	+	+		ST
ABSTRACT, ANNOTATION				+		FT

ANNEX 2. CALCULATION SCHEME

Below is a proposal of a formula devised for calculating the cost (without ITMIN overhead) of a service provided by an ITMIN information officer on a demand of an ITMIN user. The underlying principle when setting up the formula was that it should be as simple as possible; however, it should well reflect actual usage of the human and other resources involved. An asterisk (*) is an multiplication operator.

(a)	amount of work time	*	cost of a time unit
(b)	X % of (a) for the use of ITMIN computers		
(c)	number of CD-ROM records retrieved	*	cost of a record, if applicable
(d)	number of ITMIN database records retrieved	*	cost of a record, if applicable
(e)	actual cost of on-line search		
(f)	number of printed pages	*	cost of one printed page
(g)	actual cost of telephone talks, consultancy, photocopying, transportation if visits were paid, etc.		
	SUM(a,b,...,g)		

Actual unitary costs (for a working time, a record, a printed page) have to be set up as a part of ITMIN pricing policy. The unitary cost of CD-ROM and on-line can depend on the type of database.

Frequency of CD-ROMs and on-line services utilization (name, number of retrieved records) should be registered for further analysis.

The costs are subject to periodical (e.g. quarterly) revisions as a function of the inflation rate in Sri Lanka.

In order to arrive at a final cost of the service, the ITMIN general overhead should be added to the SUM.

The data required by the formula will be delivered by the information officer processing the query/order and input by him/her to the accounting sub-module. The final calculation, before uploading the obtained cost to the ITMIN main accounting module, is a subject to endorsement on the part of the authorized manager.

Example of calculation

Component	Amount	Unit cost Rs	
work (hrs)	3	80	240
computers*)			216
CD-ROM dbases	8	10	80
ITMIN dbases	4	15	60
on-line			1,200
pages	20	5	100
other			200
		TOTAL	2,096

*) The X=0.9 coefficient was assumed

Note 1: all the unit costs are exemplary.

Note 2: CD-ROMs dbases and ITMIN dbases can be split depending on the type of dbase.

prepared by M. Muraszkiewicz *September 4, 1995*

ANNEX 3. INTERNET CONNECTION REQUIREMENTS

NOTE FOR FILE

The meeting with the representatives of SL TELECOM (Mr. G.A.D. Silva and Dr. G. Dias) took place at the premises of ITMIN, on the 18th of Sept., 1995. The Internet operation requirements by ITMIN were specified. The following was agreed upon.

1. 256 IP addresses will be assigned to ITMIN.

2. The domain name will be *ITMIN.LK*. A letter to CINTEC for registering the name will be sent by ITMIN.

3. ITMIN will apply to the telecommunication authorities for the license which will allow ITMIN to provide the Internet services and provide SLIP connectivity on a commercial basis.

4. ITMIN will acquire a router with V.35 whereas SL TELECOM will provide Data Server Unit, a leased synchronous 64 Kbp/s line and modems. In addition, SL TELECOM will assist ITMIN in acquiring 12 ordinary dial-up telephone lines.

5. The preliminary tariff is as follows:

    - 39,000 Rs installation;
    - 160,000 Rs annually for the line (paid quarterly);
    - 1,000,000 Rs annually for connecting to the first-level overseas Internet services provider (paid quarterly).

Mr. Silva will prepare an official proposal on the part of SL TELECOM regarding the provision of the leased line and connection to the Internet, and sent it to ITMIN in the coming days.

M. Muraszkiewicz 18 Sept., 1995

ANNEX 4. ITMIN FP COMPUTING ARCHITECTURE

This Annex contains two documents, namely:

- the fax to Dr. P. H. Makin, Backstopping Officer;
- the document entitled "Access to ITMIN Focal Point. Development Issues" which was presented during the meeting of the ITMIN Directors (members of the Board).

Telefax message

To: Dr. Paul H. Makin
Subject: ITMIN FP computing architecture
Date: 4 September 1995

prepared by M. Muraszkiewicz, in co-operation with V. Ratnarajah and E. Vajda

Dear Paul,

Thank you for your fax dated 30 August, 1995 regarding the architecture of the ITMIN computer set up. Below are our comments and questions structured in three sections, namely: Access, LAN, Accounting.

Access

1. In general, the idea of having unified access to the Internet facilities and ITMIN databases is good, especially that it allows one to use instantly the existing Internet tools and expertise while developing the ITMIN front-end processor on the RS/6000 computer.

2. The proposal that the remote ITMIN users (nodes and other subscribers) will be connected by SLIP/PPP is feasible in Colombo although in practice we cannot expect a better speed than 9,600 bauds, still with a transmission error rate slightly higher than it should be. A very practical conclusion drawn from this fact is that the HTML pages should not contain too much graphics.

   Of course, ITMIN has to get a license from the telecommunication authorities in order to be able to offer SLIP/PPP on a commercial basis to its users.

   Obviously, the non-nodal ITMIN databases users will pay more for installing SLIP/PPP and other Internet client software on their computers than for simple dial-up connection and, in addition, someone has to do it for them. The ITMIN extension team (we call it sometimes Dr. ITMIN Team), which we have planned to set up in any case, has to be trained accordingly. Can the Internet consultant do that ?

3. We understand that according to your proposal the remote users will access the ITMIN database sitting on the SCO UNIX Pentium machine via WWW. That's fine However, the following questions arise:

- is it possible that after having authorized the user on the basis of his/her password and activating the software for collecting statistics on the amount of time logged on, WWW will become transparent and the user will see nothing but the Micro CDS/ISIS application ? In other words: can the WWW server start working like *telnet* ?

  To have this "transparency" feature is extremely important because we have to be sure that when formulating a query the user is given the actual menus and dictionaries as provided by the ITMIN database system. Needless to explain that setting up the query without such a lexical support is pointless.

  We raise this question since we are not sure whether in the procedure described in your fax (which is based on forms allowing the user to write a query which is passed to a gateway, then parsed and submitted to the database software) the user has a chance to see the dictionaries and other facilities necessary for setting up a good query.

  Incidentally,

  * which WWW server do you plan to use: is it HTTPD by NCSA, the CERN one or Plexus ? (seems that a public-domain Web server which does not involve additional cost would be better; in addition, servers written in C rather than in Perl, which is hardly known here, are preferred);

  * which Web browser do you propose for the nodes and terminal users ? We think that along with a point-and-click graphical browser such as Netscape we should also provide a character-based browser such as Lynx (remember speed is limited ?). Again, the cost is a factor because terminal non-nodal users will pay for the software allowing them to contact ITMIN;

  * what kind of programs for collecting statistics do you have in mind; anything like *getstats*, *wwwstat* ?

- assuming that WWW can become transparent after initiating statistics collection, selecting the options on the access menu and user access rights to a database authentication, can we be sure that the statistics are still collected ?

4. Due to advantages related to WWW, a WWW server as a general access facility seems to be very attractive, indeed. However, if we don't make use of it for the reason mentioned above, there is still a possibility to use *gopher* with a link to *telnet* or directly *telnet* compounded by appropriate login menu and statistics collection programs. This solution, however, requires, among others, that along with the WWW client we'll have to install the gopher/telnet client software on the user's side (which we would most likely do anyway). We don't consider this as an obstacle. The

only question is whether the Internet consultant who is supposed to set up the front-end processor can do all those things ?

5. Whatever the solution, there is one addition issue of tremendous importance, namely **security**. Our main concern is to avoid giving access to the outside users to the UNIX shells. For instance, if we use *telnet login* to provide database services, we must not use a full-featured shell or command interpreter as the login shell; otherwise someone (cracker, competitor ?) might gain *root* privilege and can do damage. It is not even a question of unauthorized access to the data, it is the danger of destroying the whole ITMIN computing environment.

Anyway, setting up a local firewall seems to be absolutely necessary !

Now, the question is: does the establishment of the firewall significantly change

- our architecture (may be a solution based on a simple screening router, without a bastion host, provides enough protection ?);

- the effort (workload and time) needed to implement the whole ITMIN front-end processor ?

And also: can the Internet consultant set up the firewall ?

6. Your opinion that "simple dial-up via modem and terminal emulation should not be considered" is shared by us as far as the on-line ITMIN databases users are concerned. However, we expect there will be many users who might be interested in ITMIN in general or would like to place a query from time to time, and who have computers and modems. These people should be given the opportunity to access ITMIN in a way somehow similar to what is offered by BBS's.

So, the thing should work as follows. You dial-up, then you see the main menu from which you can select an option. The menu can look like (it is just an example, subject to further elaboration):

ITMIN GENERAL INFO BOARD & QUERY BOX

1. What's ITMIN ?
2. Description of ITMIN information resources, services and products offered
3. How to become an ITMIN subscriber ?
4. What's news ?
5. ITMIN and Internet
6. How to navigate within ITMIN ?
7. ITMIN partners
8. Current ITMIN tariffs
9. ITMIN Bulletin

10. List of ITMIN users
11. Query box (here you can leave your query)
12. How to make a query ?

...

Exit

It should be stressed that the person who has accessed this service can leave his/her query by writing it on a pre-formatted page provided by the system. Then the query will be processed in a regular way by the ITMIN staff. In addition we should allow the people to download most of the text files which are behind the options given on the menu.

A sort of replication of this concept should be implemented on the WWW server, too.

Now, there is a question to you: do you know any off-the-shelf software which could be used for fast implementation of the idea described above ?

7. An important comment to this section is that we have to ensure workable cooperation between the persons working on the Internet component of ITMIN where it has something to do with accessing the ITMIN databases software and the Foundation for Advanced Computer Studies which is being contracted to develop the DOS and UNIX version of this software. In this respect, we have already put a special clause in the contract with the Foundation, but independently of this measure we'd very much appreciate your assistance in establishing such a cooperation channel.

LAN

8. As of this writing, the only thing connecting the PCs (workstations) constituting the LAN is *Ethernet*; no NOS (Network Operating System) such as Novell is available on the LAN for the time being. That means, *inter alia*, that:

   - data inputting to the DOS version of the ITMIN database will be practically possible on one workstation only, which in the light of a large amount of data to be input and specialization of information officers cannot be accepted.

     Of course, parallel input on several separate workstation then merging the data is feasible, but it is not an acceptable solution because of validation constraints;

   - the ITMIN staff will not be able to share common application tools, for instance to carry out information packaging and typical office automation tasks such as word processing, making spreadsheets, graphics, etc. To sort this problem out each or almost each workstation will have to be equipped with its own tools (e.g. Word, Ventura, Excel, PowerPoint) what implies a considerable additional investment.

Given the above we have to acquire a NOS. Other reasons to do this are given in the next points.

9. As we have learned from the local IBM people, running a UNIX and a DOS partition in parallel on the existing Pentium computer without significant reduction of the performance is hardly possible, if at all. The fact is that the SCO UNIX version of the ITMIN database has to be run on the Pentium. Therefore, the DOS version of the ITMIN database has to be migrated to the LAN which means that one of the workstations has to play the role of the database server (probably after some upgrading). Now, we have another reason why we need a NOS on the LAN: simply because the ITMIN staff will be using the DOS version of the ITMIN database for retrieval, browsing, data entry, printing on the day-to-day basis. Incidentally, we hope that this new database server will be able to administer the whole LAN, in particular to handle the common applications (WordPerfect, Word, Excel, Ventura); otherwise we shall need to sacrifice another workstation to play this role. So, as you see the things are getting a little bit more complicated. Your hints on this issue are really welcome.

Accounting

10. There are three accounting aspects related to ITMIN, namely:

    (a) general ITMIN accounting - for the whole house;

    (b) accounting related to the outside users;

    (c) accounting related to the ITMIN information officers who process external orders.

    The two latter have to be linked to the former.

    As to point (a), a decision will have to be taken in the nearest future, in particular - which standard accounting package is the most suitable for ITMIN ?

    As to point (b), we understand that an appropriate program will be delivered and installed by the Internet consultant on the front-end processor. Thus, the only thing for us will be to prepare a billing scheme and a facility to structure the data collected by this program and to transfer it to the ITMIN main accounting module as mentioned in p. (a). The sooner we know the name of this program, the better.

    As to point (c), we are in the process of setting up a billing pattern which will be based on the amount of time and resources involved in preparing the answers to users' orders by the ITMIN information officers. Again, once the order has been served, the corresponding billing data has to be sent to the ITMIN main accounting module.

Our programming staff, which is being set up, will take care of (a) and (c) as well as linking (b) and (c) to (a).

It is very likely that the ITMIN main accounting module will be installed on one of the workstations sitting on the LAN. This is another reason why we need a NOS.

To summarize, there are some points to be clarified and a lot of work to be done. This is why we badly need a steady support of an international consultant to lead the local programming team and to ensure seamless integration of its output with the work of the Internet consultants and of the Foundation for Advanced Computer Studies.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

working material, ver. 2.0

ACCESS TO ITMIN FOCAL POINT DEVELOPMENT ISSUES

ITMIN Project DG/SRL/93/010

by M. Muraszkiewicz

Colombo, September 19, 1995

TABLE OF CONTENTS

MAIN ABBREVIATIONS

BBS	Bulletin Board Service
FP	Focal Point
HTML	HyperText Markup Language
HTTP	HyperText Transport Protocol
ITMIN	Industrial, Technology and Market Information Network
LAN	Local Area Network
NOS	Network Operating System
PPP	Point-to-Point Protocol
SLIP	Serial Line Internet Protocol
WWW	World Wide Web

Background

1. It has been decided that the ITMIN computing architecture will be based on the following components:

   - front-end processor (RS/6000, AIX 3.2.5);
   - database server (Pentium 100 MHz, SCO UNIX);
   - LAN (Pentium 75 MHz, Windows for Workgroups).

2. The front-end processor will handle, *inter alia*,

   - telecommunication tasks;
   - Internet services;
   - access to the ITMIN database placed on the databases server (Pentium, SCO UNIX);
   - collection of statistics related to the work of remote users and the ITMIN staff when using X.29/25 and the Internet;
   - ITMIN Bulletin Board Service (BBS).

Note: It is also proposed to set up (in the future) a fax server which will work in such a way that after having received a fax call from any fax machine, it will automatically fax back the information on ITMIN, its services and tariffs.

Access modes to ITMIN FP

3. The access modes to the ITMIN FP are listed below:

Classic

- to visit the ITMIN FP in person and speak to an information officer;
- to make a telephone call and speak to an information officer;
- to send a fax or a letter;

Electronic

- to get connection with the ITMIN Bulletin Board by dialing-up;

- to get connection with the ITMIN Internet service by dialing-up (in this case the service is limited); for instance to send an e-mail message to anyone on the Internet, in particular e-mail (containing a query or an order) to the ITMIN box;
- to get connection with the ITMIN FP via SLIP or PPP;
- to get connection with the ITMIN FP through the "external" Internet.

Categories of ITMIN users by access type

1. The ITMIN users can be categorized as follows (see Fig.1):
   - members (FP, nodes);
   - subscribers (organizations, individuals) who pay ITMIN regular fee;
   - casual users (organizations, individuals) who do not pay a regular fee; yet they will be charged for the services provided (note, however, that the BBS service will be free-of-charge).

TAXONOMY OF ITMIN USERS AND ACCESS MODES

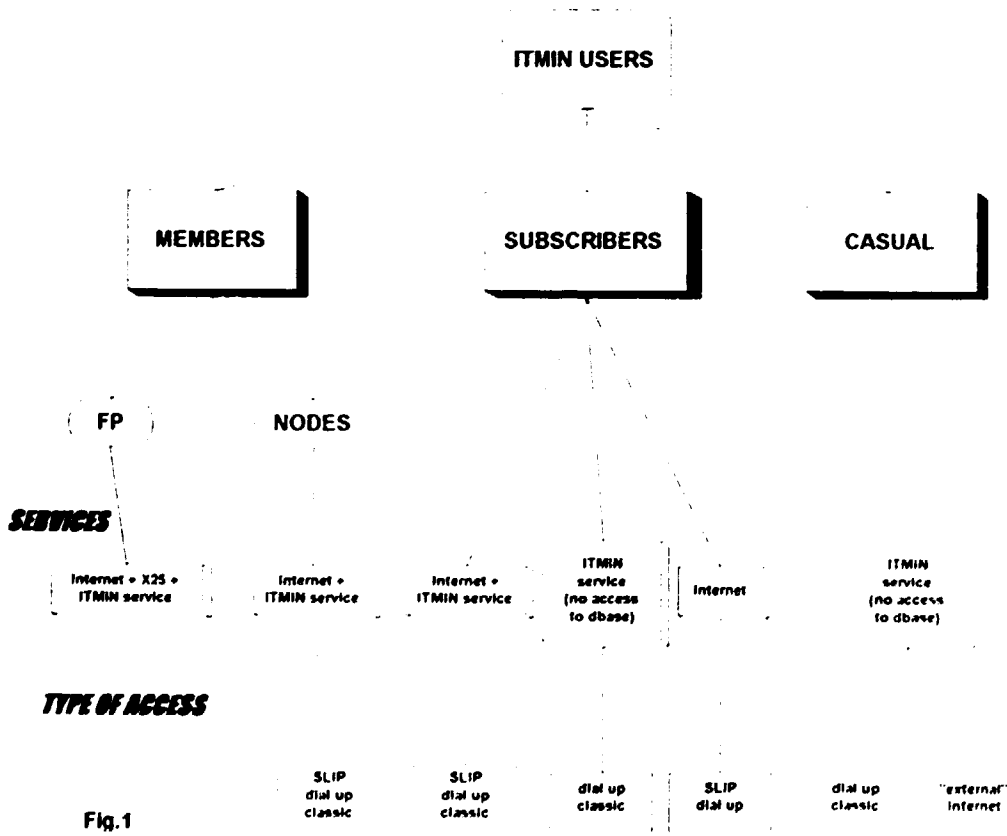
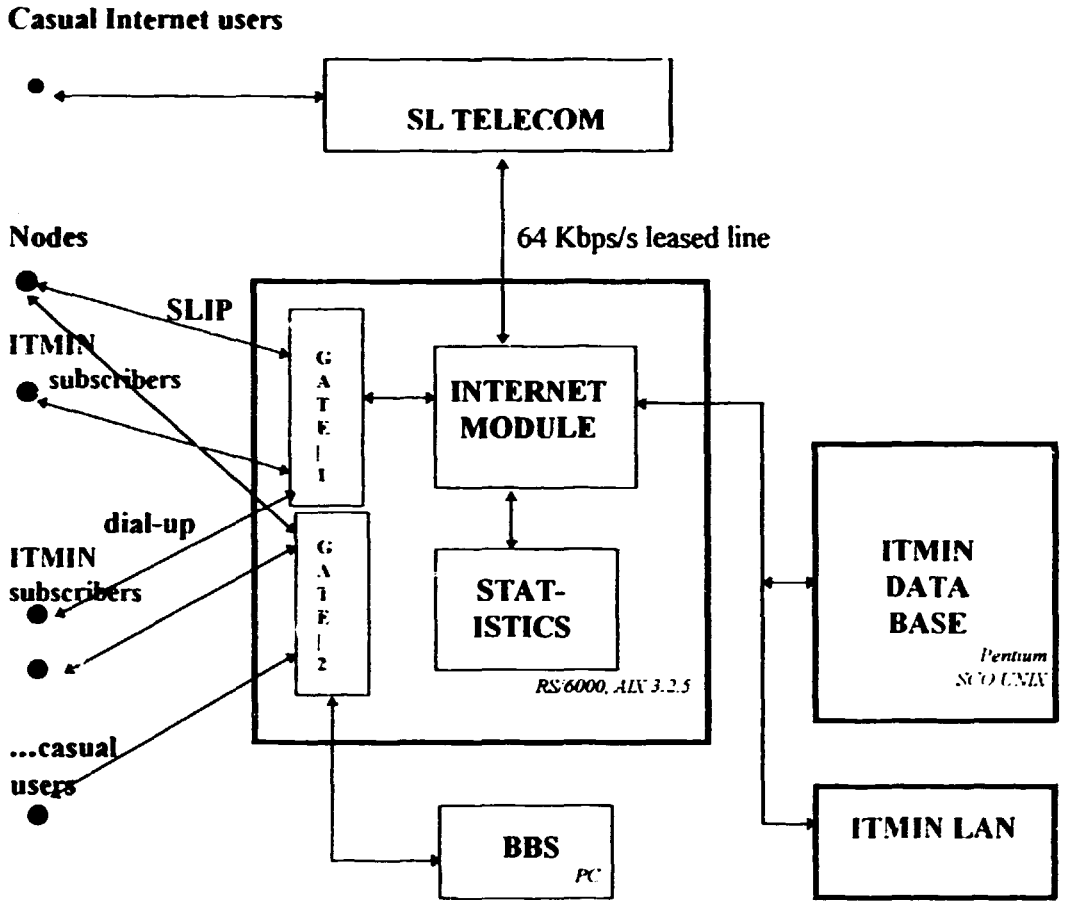


Fig.1

Telecommunication access to ITMIN FP



Note: The figure does not display the X.25 link between the ITMIN LAN and foreign information services providers

Fig.2. Access scheme to ITMIN Focal Point

Configuration and functions

1. The main elements of the configuration (see Fig.2) are:

   - the ITMIN front-end processor which is an IBM RS/6000 computer. This computer, working under AIX 3.2.5, will be an access point to ITMIN. It will control the login and logout of external and internal users, run the Internet module and collect the statistics (to be used for traffic analysis and billing) related to the on-line sessions. A Pentium PC is proposed to be connected to the front-end processor in order to run the ITMIN Bulletin Board Service; however, access to this computer will be via the IBM RS/6000 machine;

   - the ITMIN database server which is a Pentium 100 MHz machine working under SCO UNIX. The SCO UNIX version of the ITMIN database software and the database itself will be sitting on this machine. In addition, the data files

of the DOS version of this software will be installed on the hard disk of this computer;

- a LAN, connected by means of the Ethernet facilities, composed of some 24 Pentium PCs (75 MHz machines). Windows for Workgroups is proposed as a NOS for the LAN. The workstations of the information officers will have the DOS version of the advanced Micro CDS/ISIS installed.

  Noteworthy, one of the workstations will be dedicated to run the main ITMIN accounting system (most likely based on the Concorde package) and another one to run: (i) office automation software (e.g. MS-Word, Excel, Power Point) and (ii) desktop publishing software (e.g. Ventura), both to be shared by the whole ITMIN staff; and (iii) the accounting package for registering the workload and resources involved in processing the users' queries by information officers.

2. The UNIX machines will be inter-connected so that access to the SCO UNIX computer in order to run the ITMIN database by remote users be possible. A WWW server combined with *telnet* will be applied to ensure the connectivity. The LAN will be connected to the SCO UNIX machine by means of the TCP/IP facility which is embedded in Windows for Workgroups. The LAN will be connected to the RS/6000 machine to provide the ITMIN staff with access to the Internet.

Access

3. The underlying principle regarding the access to the ITMIN FP for the ITMIN subscribers and nodes is that the access platform is unified which means that regardless of further activities the connectivity is always based on the Internet facilities (see Fig. 1), except for the access to BBS which can be obtained directly by dial-up.

4. All the ITMIN nodes are attached to the FP by means of SLIP (or PPP); in addition they may use a simple dial-up connection. The ITMIN subscribers are to be attached by SLIP/PPP (which is the preferred mode) or by dial-up. Having accessed the ITMIN FP by SLIP/PPP they can either get access to the ITMIN database (placed on the Pentium SCO UNIX machine) or to invoke classic Internet procedures. Access through the dial-up connection will allow the users for running simple Internet services, basically e-mail. The dial-up link might be also used for accessing BBS.

5. The dial-up access to the ITMIN Bulletin Board (BBS) will be also possible for the casual users.

6. It has to be stressed that the casual users will not be given access to the ITMIN database. However, they can enjoy the ITMIN Internet environment, e.g. the ITMIN Home Page on the ITMIN WWW server.

Interaction

1. Having accessed the front-end processor by SLIP/PPP the ITMIN subscribers and members will see the menu (which in fact will be a switching mechanism to the services offered) containing available options that for instance might be the following:

   - Access to the ITMIN databases;
   - Access to the Internet;
   - ITMIN Info Board;
   - Query Box.

2. Having selected one of these options the user will be brought to the corresponding services. Noteworthy, the ITMIN Info Board is a replication of the BBS which is described in the next paragraph.

3. As already mentioned, the ITMIN members working at the nodes, ITMIN subscribers and casual users will be given the opportunity to access ITMIN via dial-up in a way somehow similar to what is offered by conventional BBS's. The ITMIN BBS menu can look like (it is only an example, subject to further elaboration):

ITMIN GENERAL INFO BOARD & QUERY BOX

1. What's ITMIN ?
2. Description of ITMIN information resources, services and products offered
3. How to become an ITMIN subscriber ?
4. What's news ?
5. ITMIN and Internet
6. How to navigate within ITMIN ?
7. ITMIN partners
8. Current ITMIN tariffs
9. ITMIN Bulletin
10. List of ITMIN members and subscribers
11. Query box (here you can leave your query)
12. How to make a query ?
...
Exit

It should be stressed that the person who has accessed this service can leave his/her query by writing it on a pre-formatted page provided by the system. Then the query will be processed in a regular way by the ITMIN staff. In addition, the BBS visitors should be allowed to download most of the text files which are selected via the options given on the menu.

Follow-up

Below are specified the main tasks to be undertaken in order to build up the telecommunication access mechanism to the ITMIN resources.

For ITMIN Ltd.

1. To acquire and install a terminal server and a router (connected to the IBM RS/6000 machine) according to the specification by Mr. M. Graff.

2. To identify and train the administrator of the whole ITMIN hardware network.

3. To set up subscribing/membership and pricing policy.

4. To apply to the Sri Lankan telecommunication authorities for a license allowing ITMIN to provide the subscribers with the Internet services, in particular on the basis of SLIP/PPP.

For UNIDO

1. To set up the Internet module within the "Front-End Processor" (IBM RS/6000) and to assist in connecting it to Sri Lanka TELECOM.

2. To clarify the functions of the program for collecting statistics related to the work of remote users (this program will be set up on the IBM RS/6000 computer).

3. To train the ITMIN staff (2-3 persons) in the Internet operation and in using WWW. Special stress has to be put on the skills necessary to create HTML (Hyper Text Markup Language) documents. The training will be a part of the Job Description of an international consultant whose intervention regarding the Internet module set up is planned for the end of October/beginning of November..