THE REPUBLIC OF UGANDA

ELECTRICITY REGULATORY AUTHORITY

CONSULTANCY SERVICES FOR
DEVELOPMENT OF
AN INTEGRATED INFORMATION MANAGEMENT SYSTEM

FINAL REPORT

May 2007

Submitted by:	***Submitted to:***
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Acknowledgement

This is the final report on the Design and Implementation of The Integrated Information Management System (IIMS) at Electricity Regulatory Authority (ERA). The report is a result of a long consultancy provided by Computer Supplies Ltd (CSL) in association with SysCorp International (SYS)

The consortium also engaged the services of Mr. Mark Davis of Enon Analysis to analyse and review the Reporting Schedules used by the licensed utility companies to provide ERA with critical data used in the electricity sector.

As we bring this project to its conclusion, we would like to thank the Management of ERA first for providing us with the opportunity to serve the institution and secondly for the cooperation in bringing the project to what we feel is a successful conclusion.

We would also like to extend our most sincere appreciation and gratitude to the members of staff at ERA for their interactive participation throughout the project through responses to questionnaires, provision of critical data, report samples and attending training sessions which formed a vital part of information transfer in this project.

Our thanks also go to the licensee utility companies for their invaluable contribution to the redesign of the Reporting Schedules during several seminars on the subject. We also value their contribution in testing the **Data Capture Utilities** by pointing out bugs in the applications and providing test data we have used in our **Data Analysis and Report Generation** application.

Last but not least, we would like to express our most sincere thanks to the Project Steering Committee and its Chairman for a job well done in guiding us to remain on course and for their role in ensuring that the different stakeholders play their part in the project.

We believe that ERA has invested wisely in this project and are convinced that the organisation will reap from the enhanced Integrated Information Management Systems in place.

We remain committed to help ERA maximise benefit from this investment we are proud to be associated with.

We are only a call away.

Computer Supplies Ltd & SysCorp International

1. Introduction

Computer Supplies Ltd (CSL) in partnership with SYSCORP International were mandated by the Uganda Electricity Regulatory Authority on successful winning of an open bid process to improve the authority's Information Management System (IMS). The contract which initially covered the period December 2005 to July 2006 was extended to January 31st 2007 due to delays in procurement of the requirements for implementing the redesigned system.

Through a mutual agreement, the project handover was extended to the end of February 2007 mainly to ensure that training is completed and that sample report from the Data Analysis and Report Generation application are finalised.

1.1 Terms of reference

In order to evaluate the level of success of the consultancy, it is important to state the terms of reference and compare them with what has been realised during the project timeline.

The scope of work under this consultancy include:

1. To review the information systems in ERA and propose a Strategy that ensures optimization of IT resources and maximizes opportunities for meeting current and future information needs.

2. To investigate and identify the necessary software and hard ware to be used for the operationalisation of the IIMS.

3. To analyze the existing database, propose and develop an appropriate structure of the database. As a critical feature, the database should have a functionality that facilitates electronic data capture and automatic generation of analytical reports of specific parameters.

4. To investigate and design the appropriate structures and procedures on how information can be shared within the organization, with key stakeholders and the general public. The consultant shall consider web-based solutions. The consultant shall also develop an interface between the ERA Website and the database and shall ensure that the website is able to carry files that are downloadable in common file formats i.e. Pdf, Word, Excel, Access etc)

5. The consultant shall computerize the Registry and Library information systems.

6. To ensure security and integrity of the data through establishment of comprehensive access levels to protect the confidentiality of data, accuracy and to promote vertical reporting. The consultant shall also review the current LAN security measures i.e. firewalls, filters for inappropriate content, antivirus, etc and advise and implement appropriate remedial actions. The consultant shall produce an access and security policy document.

7. To establish disaster management and recovery strategies with appropriate backup routines and advise on the appropriate back-up facilities.

8. To review the current reporting schedules, implement the proposed revisions of the reporting schedules and update the manual to capture the proposed changes. The revisions should include but not be limited to the changes indicated in the ERA Database Taskforce Report. The consultant should develop an electronic reporting schedule that interfaces with the database and takes into account issues of data security.

9. Review the data needs presented in the ERA Database Task Force Report for usefulness in terms of ERA's regulatory roles and the needs of stakeholders.

10. To train ERA staff assigned to the task in the development and management of the IIMS.

1.2 Expected output

On conclusion, the consultancy is required to have the following outputs

1. Integrated Information Management System.

2. Revised Reporting Schedules and an updated Manual on the Reporting Schedules.

3. IT policy document. This should include, but not be limited to issues related to access levels, security, data archiving and disaster management.

4. Final Report on the project.

1.3 Contents of this report

This is the last and final report on this project from the consultants. It is a unique form of the report because it does not only present the last activities of the project but makes reference to all important reports and documents the consultants have delivered to the client.

In order to avoid a bulky document, all previous key documents, right from our Technical Proposal, Inception Report, Progress Reports, etc are presented as addenda to this report in two forms namely in bound hard copies and in soft form on a CD.

This report contains the following:

1. **This Introduction chapter**
2. **The IIMS hardware and software System configuration at the time of handover**
3. **Comments on each Term of Reference**
4. **Comments on the expected Output of the consultancy**
5. **Summary of issues not fully implemented**
6. **The Impact of the IIMS project**
7. **Specific examples of improved performance functionality of the IIMS**
8. **Recognising the new potential**
9. **The Way Forward**
10. **Appendix A: Interconnection of hardware in the Rack**
11. **Appendix B: List of Key Documents, Reports and Applications**

1.4 Project coordinating committee

During the execution of this assignment, key personnel from both the consultants and the client were identified for ease of coordination and communication with regard to the project. The table below lists the people in the committee together with their contacts

Organisation	Name	Phone	Email
ERA			
1	Benon Mutambi	0772 432 001	b.mutambi@era.or.ug
2	Charles baker	0772 465 010	c.baker@era.or.ug
3	ERA Offices	041 341 646 041 341 624 041 341 852	
CSL/SYA			
1	Eng Darlington Sakwa	0772 500 540	compsupp@africaonline.co.ug and Sakwa@darlingtonsakwa.com
2	Joseph Kavulu	0712 271 890	jkavulu@africaonline.co.ug
3	CSL Offices	0414 540 006	compsupp@africaonline.co.ug

2. IIMS hardware and Software Configuration

2.1 Major components

The IIMS has been built on the following major components. Some of the components were acquired as new additions to the LAN while others were either upgraded or redeployed as found at the start of the project. The tables below briefly describe the major components in the system.

2.1.1 Hardware components

Item	Description	Purpose	Comment
1	42 U Rack with integrated UPS, Gigabit switch, KVM switch, LCD Display counsel, keyboard and pointing device	To securely and conveniently house all servers for the IIMS	Acquired as recommended by consultants
2	High Capacity Domain controller server	Offer centralised security management for the entire IIMS domain	Acquired as recommended by consultants
3	High Capacity Database Server	Provide centralised and secured storage for shared data and applications databases	Acquired as recommended by consultants
4	High Capacity Applications Server	Provide high speed access and source for shared applications, Intranet and future web based applications	Acquired as recommended by consultants
5	Mail server	Provide Internet and Email Access for IIMS users	Deployed as found in the old system but improved through DNS configuration to improve speed
6	Workstations	User access and working link to the Domain	Upgraded to minimum of 512MB RAM and 80GB hard disk then redeployed in the new system.
7	High Speed Scanner	Enable scanning of documents to be stored in soft form on the database server	Acquired as recommended by consultants
8	Data distribution switches and patch panels	Distribution of networking services throughout the building	These were already installed. The consultant tested for speed and functionality quality and found them satisfactory.

2.1.2 Software components

Item	Description	Purpose	Comment
1	Microsoft Windows Server 2003 R2 Enterprise Edition	Managing the new IIMS domain with improved security, Intranet and future WAN services	Acquired as recommended by consultants
2	Microsoft SQL Server 2005 Enterprise Edition	Database engine for all database applications running on the IIMS domain	Acquired as recommended by consultants
3	Microsoft Windows XP Professional	Operating System for all workstations connected to the system, offering higher productivity and security	Acquired as recommended by consultants
4	Microsoft Office 2003 Professional Enterprise Edition	Enhanced Desktop Office productivity software with built in collaboration to enable users take advantage of team work	Acquired as recommended by consultants
5	Organiser Pro Small Library Database Software	Enable online library/registry information for users	Substituted after G3 Software failed to function as specified
6	Reporting Schedules Data Capturing Utilities for licensee companies	Ease data capture into reporting schedules by licensees	Bespoke software developed by the consultant
7	Reporting Schedule Data Capture and Analysis System	Build reporting Schedule database at ERA and generate analytical reports	Bespoke software developed by the consultant
8	Soft document Manager	Index and Reference all soft documents for common access from any workstation within the IIMS Domain	Bespoke software developed by the consultant
9	ERA Website	Public Access to information from ERA and feedback to ERA	Redesigned by the client for improved look and performance

2.2 Hardware configuration

The hardware configuration is based on an integrated server system enclosed in a 42U Rack. The hardware in the rack is interconnected using a high speed Gigabit switch located within the rack.

The Mail/Internet server has two network cards installed. One card connects to the ISP provider via a router and Data Terminal Unit (DTU) while the other card connects to the high speed Gigabit switch to provide the gateway to the other servers and workstations to the mail and internet services.

One of the ports on the gigabit switch is linked to the rest of the LAN within the building by connecting it to one of the switches found installed on the three floors at ERA house.

All the four servers are protected from power surges and blackout through the APC 3KVA uninterruptible power supply contained within the rack. ***(See Inter connection diagram in Appendix A)***

2.3 IP configuration

The LAN is based on a DHCP IP system with the Domain controller leasing IP addresses to the rest of the systems including two of the servers. This makes system administration easier.

The table below shows the IP configuration

Purpose	Network Name	IP Address	Subnet	DNS	Default Gateway
Domain Controller	**ERA1**	192.168.0.1	255.255.255.0	192.168.0.1	
Application Server	**ERAAPP**	192.168.0.3	Auto	Auto	Auto
Database Server	**ERADB**	192.168.0.5	Auto	Auto	Auto
Mail Server		192.168.0.254			
Workstations	Various	Auto	Auto	Auto	Auto
Network printers	Various	Auto	Auto	Auto	Auto

2.4 IP Address Leases

These are the current DHCP IP leases to equipment in the domain

Client IP Address	Name	Lease Expiration	Type	Unique ID
192.168.0.16	ECONOMIST02.	2/16/2008 7:56	DHCP	000bcd62d887
192.168.0.17	eraapp.ERA.com	2/10/2008 9:55	DHCP	00188b31dc16
192.168.0.18	SysWK06.ERA.com	2/16/2008 8:44	DHCP	000c7608168b
192.168.0.19	md.ERA.com	1/9/2008 12:40	DHCP	00010382c11d
192.168.0.20	pressario010.ERA.com	1/30/2008 11:21	DHCP	0002a5f27bce
192.168.0.21	eradb.ERA.com	2/10/2008 9:55	DHCP	00188b31d76e
192.168.0.22	PROJECT01.ERA.com	2/3/2008 12:06	DHCP	00096bf43980
192.168.0.23	pabxpc.alacte.com	1/15/2008 11:41	DHCP	0002555690f9
192.168.0.24	HP22741992128.	2/16/2008 7:37	DHCP	000ffe1f73c2
192.168.0.25	SECRETARY.ERA.com	2/15/2008 8:53	DHCP	00096bf44265
192.168.0.26	Registry.ERA.com	2/16/2008 8:02	DHCP	000bcdc2fc85
192.168.0.27	Account2.ERA.com	2/16/2008 8:48	DHCP	000ffe1f73a0
192.168.0.28	dataentry.ERA.com	2/16/2008 8:45	DHCP	000bcd616960
192.168.0.29	Margaret.ERA.com	2/16/2008 8:11	DHCP	000bcdb33a45
192.168.0.30	PublicRelations.era.com	2/15/2008 15:28	DHCP	000bcd62d88e
192.168.0.31	compengineer.ERA.com	2/15/2008 7:34	DHCP	00096bdad38c
192.168.0.32	legaloff.ERA.com	2/3/2008 8:11	DHCP	00096bf44c7d

Client IP Address	Name	Lease Expiration	Type	Unique ID
192.168.0.33	CEO.era.com	2/15/2008 8:54	DHCP	00096b4633e4
192.168.0.34	PC249083166313.	1/4/2008 8:34	DHCP	001708337d80
192.168.0.35	ECONOMIST.era.com	2/15/2008 8:44	DHCP	00110a3d09cf
192.168.0.36	ADMINOFFICER.era.com	2/9/2008 8:48	DHCP	00096b4633e2
192.168.0.37	jacklaptop.ERA.com	1/27/2008 14:44	DHCP	0010a482970a
192.168.0.38	ProcOfficer.ERA.com	2/16/2008 7:55	DHCP	00096be97f67
192.168.0.39	LTA.era.com	2/15/2008 8:52	DHCP	00096bf442d8
192.168.0.40	JAYDEE08072005.	2/16/2008 7:39	DHCP	00c09f91e5db
192.168.0.41	Expaccount.era.com	2/16/2008 8:31	DHCP	000bcd61690f
192.168.0.42	LIBRARY.	2/15/2008 15:15	DHCP	0013206b514f
192.168.0.43	desktop.	1/4/2008 10:22	DHCP	000c6e597be8
192.168.0.44	Procurement2.ERA.com	2/16/2008 8:20	DHCP	000475d689ff
192.168.0.45	FINANALYST.ERA.com	2/15/2008 8:35	DHCP	000ffe9077d4
192.168.0.46	STATISTICIAN-ITOFFICER.ERA.com	2/9/2008 18:47	DHCP	000ffe907593
192.168.0.47	Jjunju.	2/15/2008 18:29	DHCP	000fb0d6a931
192.168.0.48	syswk011.syscorp.co.ug	1/29/2008 15:51	DHCP	000c76081725
192.168.0.49	TECHLAPTOP.	2/7/2008 9:53	DHCP	00123feaa7cb
192.168.0.50	paceo.era.com	2/16/2008 7:22	DHCP	0008c79bc1f3

2.5 Computers in the Domain Active Directory

Computer Name	Display Name
STATISTICIAN-IT	STATISTICIAN-IT$
SECRETARY	SECRETARY$
REGISTRY	REGISTRY$
PUBLICRELATIONS	PUBLICRELATIONS$
PROJECT01	PROJECT01$
PROCUREMENT2	PROCUREMENT2$
PROCOFFICER	PROCOFFICER$
PRESSARIO010	PRESSARIO010$
PABXPC	PABXPC$
MDMOBILE	MDMOBILE$
MARGARET	MARGARET$
LEGALOFF	LEGALOFF$
JACKLAPTOP	JACKLAPTOP$
FINANALYST	FINANALYST$
ERADB	ERADB$
ERAAPP	ERAAPP$
ECONOMIST02	ECONOMIST02$
ECONOMIST	ECONOMIST$
DATAENTRY	DATAENTRY$
COMPENGINEER	COMPENGINEER$
ACCOUNT2	ACCOUNT2$

2.6 Registered Domain Users

Below is the list of users registered to use ERA domain. The list excludes built-in system users

Name	E-Mail Address	User Logon Name
Wamoka Jackson	j.r.wamoka@era.or.ug	WamokaJ
Unen Frederick	f.unen@era.or.ug	UnenF
Sewanyana Grace	g.sewanyana@era.or.ug	SewanyaG
Sebbowa Frank	f.b.sebbowa@era.or.ug	SebbowaF
Sarah Birungi	Bsarah@era.or.ug	BirungiS
Omara James	james.omara@era.or.ug	OmaraJ
Namugga Eron	e.s.namugga@era.or.ug	NamuggE
Nabongo Catherine		NabongoC
Mwesige Patrick	p.mwesige@era.or.ug	MwesigeP
Lugolole Samuel	s.lugolole@era.or.ug	LugoloS
Kwesigabo Johnson	j.s.d.kwesigabo@era.or.ug	KwesigaJ
Katusiime Lelia	leila@era.or.ug	KatusiimeLelia
Kansiime Mary	m.g.kansiime@era.or.ug	m.g.kansiime
Kabahweza Margaret	m.kabahweza@era.or.ug	KabahweM
Joseph Bwambale		BwambaJ
James Philip Kigongo Sembeguya	j.p.k.sembeguya@era.or.ug	j.p.k.sembeguya
Jack Mukumbya	j.mukumbya@era.or.ug	MukumbyaJ
Emmanuel Jjunju	e.jjunju@era.or.ug	JjunjuE
Doreen Akatuhwera	d.akatuhwera@era.or.ug	AkatuhwD
Christine Semogerere	cnakiganda@era.or.ug	SemogerC
Benon M. Mutambi	b.mutambi@era.or.ug	MutambiB
Baker Charles	c.baker@era.or.ug	BakerC
Arakit Betty	b.arakit@era.or.ug	ArakitB

2.7 Internal Mail Addresses for Intranet Alerts

An Internal E mail system was configured on the Application Server ERAAPP to enable users to receive mail alerts when important changes occur on the intranet like Announcements, Task Allocation, Events etc depending on the individual choices as detailed in the Intranet User Manual.

The table below shows the mail addresses used in the system. The Passwords for the mail system are given to the System administrator for security reasons

User	Internal Mail Address
Dr. Frank Sebbowa	Frsebbowa@eraapp.ERA.com
Catherine Nabongo	Cnabongo@eraapp.ERA.com
Johnson Kwesigabo	Jkwesigabo@eraapp.ERA.com
Margaret Kabahweza	Mkabahweza@eraapp.ERA.com
Sarah Birungi	Sbirungi@eraapp.ERA.com
Eng James Omara	Jomara@eraapp.ERA.com
Eron Namugga	Enamugga@eraapp.ERA.com
Charles Baker	Cbaker@eraapp.ERA.com

Christine Semogerere	Csemogerere@eraapp.ERA.com
Patrick Mwesige	Pmwesige@eraapp.ERA.com
Benon Mutambi	Bmutambi@eraapp.ERA.com
Lelia Katusiime	Lkatusiime@eraapp.ERA.com
Centenary Declane	Cdeclane@eraapp.ERA.com
James Sembeguya	Jsembeguya@eraapp.ERA.com
Doreen Akatuhwera	Dakatuhwera@eraapp.ERA.com
Mary Kansiime	Mkansiime@eraapp.ERA.com
Betty Arakit	Barakit@eraapp.ERA.com
Jack Mukumbya	Jmukumbya@eraapp.ERA.com
Grace Sewanyana	Gsewanyana@eraapp.ERA.com
J Bwambale	Jbwambale@eraapp.ERA.com
Sam Lugolole	Slugolole@eraapp.ERA.com
J Wamoka	Jwamoka@eraapp.ERA.com

2.8 Installed Applications

The following software applications are installed on the system

Application	Type	Installed on	Accessed control
Pastel Accounting	**Multi-user**	ERADB/Workstations	By password
ERA Intranet	**Multi-user**	ERAAP	Free
Reporting Schedules Data Capture and Analysis System	**Multi-user**	ERADB/Workstations	By password
Small Library Organiser Pro	**Multi-user**	ERAAPP/Workstations	By password
Soft Document Manager	**Multi-user**	ERADB/Workstations	By password

2.9 Shared folders

The following shared folders have been configured on the database server to enable and enhance collaboration among workers. Details of access are found in the documentation titled **"SHARED FOLDER AND FILE NAMING GUIDELINES"**

Department	Department folder	Sub-folder	Accessed control
Chief Executive Officer	**CEO**	Common	Entire department
		Sebbowa	Dr. Frank Sebbowa
		Nabongo	MS. Catherine Nabongo
		Birungi	Ms. Sarah Birungi
		Akatuhwera	Ms. Doreen Akatuhwera
		Arakit	Ms. Betty Arakit
Legal Department	**LE**	Common	Entire department
		Kwesigabo	Mr. Johnson Kwesigabo
		Katusiime	Ms. Lelia Katusiime
		Semogerere	Ms. Christine Semogerere
		Kabahweza	Ms Margaret Kabahweza
		Lugolole	Mr. Sam Lugolole
Finance and Administration	**FA**	Common	Entire Department
		Mwesige	Mr. Patrick Mwesige
		Kansiime	Ms. Mary Kansiime
		Sewanyana	Ms. Grace Sewanyana
		Mukumbya	Mr. Jack Mukumbya
		Namutebi	Ms. Agnes Namutebi
Economic Regulation	**ER**	Common	Entire Department
		Mutambi	Mr. Benon Mutambi
		Baker	Mr. Charles Baker
		Sembeguya	Mr. Philip Sembeguya
		Namugga	Ms. Eron Namugga
Technical Regulation	**TE**	Common	Entire Department
		Omara	Eng. James Omara
		Jjunju	Eng. Emmanuel Jjunju
		Bwambale	Mr. Bwambale
General	**GE**		All domain users

2.10 Intranet configuration

The Intranet is made up of a main website titled "**Electricity Regulatory Authority Intranet"** and departmental Intranets to enhance departmental collaboration

All domain users have access to the main Intranet website and can read, download contents of the website and contribute material to the website.

1. **Departmental intranets carry the name of the department and are titled as indicated below**
2. **CEO's Office Workspace**
3. **Economic Regulation Workspace**
4. **Technical Regulation Workspace**
5. **Legal Workspace**
6. **Finance and Administration Workspace**

Access to the departmental intranets is security controlled and limited to only departmental staff with the Exception of the CEO who has access to all intranets. Authorised members can read, download content and contribute to the Intranets

Details of the Intranet configuration are found in the document titled "ERA Intranet"

3. Comments on Each Term of Reference

TOR No.	Description	Status at handover
1	To review the information systems in ERA and propose a Strategy that ensures optimization of IT resources and maximizes opportunities for meeting current and future information needs.	Fully done. Additional requirements specified in design report.
2	To investigate and identify the necessary software and hard ware to be used for the operationalisation of the IIMS.	Fully done. All hardware and software specified, procured and installed
3	To analyze the existing database, propose and develop an appropriate structure of the database. As a critical feature, the database should have a functionality that facilitates electronic data capture and automatic generation of analytical reports of specific parameters	Fully done. Sample reports have been defined and tested. The reporting utility enables the reports to be exported to MS Excel and Adobe PDF file formats.
4	To investigate and design the appropriate structures and procedures on how information can be shared within the organization, with key stakeholders and the general public. The consultant shall consider web-based solutions. The consultant shall also develop an interface between the ERA Website and the database and shall ensure that the website is able to carry files that are downloadable in common file formats i.e. Pdf, Word, Excel, Access etc)	Main part done. Due to suspension of purchase of ***ImageNow*** Workflow and Document management software, some of the data sharing attributes are not fully in place. **The decision not to purchase *ImageNow* was taken by the client for financial and other reasons**
5	The consultant shall computerize the Registry and Library information systems.	Fully done, The Library, the registry and Permits are now fully computerised
6	To ensure security and integrity of the data through establishment of comprehensive access levels to protect the confidentiality of data, accuracy and to promote vertical reporting. The consultant shall also review the current LAN security measures i.e. firewalls, filters for inappropriate content, antivirus, etc and advise and implement appropriate remedial actions. The consultant shall produce an access and security policy document.	Fully done. Security guidelines included in the IT Policy document. All system users are verified by active directory security settings
7	To establish disaster management and recovery strategies with appropriate backup routines and	Fully done. Regular backup is specified in the IT Policy

	advise on the appropriate back-up facilities.	security section. All servers configured for raid as a means on enhancing security within the system in the event of a crashed hard disk (IT policy)
8	To review the current reporting schedules, implement the proposed revisions of the reporting schedules and update the manual to capture the proposed changes. The revisions should include but not be limited to the changes indicated in the ERA Database Taskforce Report. The consultant should develop an electronic reporting schedule that interfaces with the database and takes into account issues of data security.	Fully done. Revised Reporting Schedules and their manuals have been delivered. Access based Data capturing utilities designed for all reporting service categories and are now used for quicker data capture.
9	Review the data needs presented in the ERA Database Task Force Report for usefulness in terms of ERA's regulatory roles and the needs of stakeholders.	Fully done. The majority of the wishes expressed in the Database Task Force report have being implemented
10	To train ERA staff assigned to the task in the development and management of the IIMS.	Fully done but it appears some people need more training

4. Comments on the Expected output

Output No.	Description	Status at handover
1	Integrated Information Management System.	An Integrated System has been implemented save for the missing **Workflow and Document Management systems which was based on *ImageNow* software.** **However, the consultant has implemented a lower level workflow system using the Intranet**
2	Revised Reporting Schedules and an updated Manual on the Reporting Schedules.	Schedules have been fully revised and updated manuals provided. In addition, a data capture utility to ease data collection by licensees has been developed and is now being used. A set of revised reporting schedules in Excel has also been provided for those who wish to report manually.
3	IT policy document. This should include, but not be limited to issues related to access levels, security, data archiving and disaster management.	The IT policy was delivered. In addition, a Library policy draft document has been handed to the project coordinator
4	Final Report on the project.	This document is the final project report

5. Summary of issues not fully implemented

5.1 Workflow management and User Portal implementation

Although the IIMS project was designed to deliver a fully integrated system with most of the collaborative tasks automated through a document management and workflow software, the financial requirements for acquiring the backbone integration systems as well as the need to limit the introduction of too many new aspects in the work methodology curtailed some components of integration

As a result, ***ImageNow*** Document Management and Workflow software and Windows SharePoint Portal Server2003 were not purchased.

The consultants however took advantage of the new features of Microsoft Windows Server 2003 R2 and Microsoft Office 2003 Enterprise Edition to build in the system a reasonable degree of work collaboration

Through the use of the Intranet, tasks can now be allocated to people who will receive alerts for work assigned to them. The shared document libraries, events and announcements features of the Intranet offer an organisation wide information portal for all staff who care to check the Intranet regularly.

A special configuration of the Outlook 2003 mail application enables users to get desktop alerts for mail originating from selected sources within the organisation. This configuration forces the user to at least see the source of mail and with discipline, improved collaboration is expected.

5.2 Integration of Finance and HR functions

An attempt has been made to integrate these two functions into the IIMS in order that management reports are made available to those who need them

Demonstrations on the Human Resource Application and the Assets register application were presented by the Pastel provider to both the **Project Steering Committee** and Personnel from the **Finance and Administration Department**.

A decision was made to acquire the Human Resource component and leave out the Assets component. The matter was therefore left to the client to proceed with purchasing the required modules for integration.

The consultant has not received any communication on the status of this purchase as we close the project.

6. The Impact of the IIMS project

Although not expressly stated, judging from the terms of reference, the IIMS project had as a general objective the desire to improve on the information management and sharing in order to increase productivity by staff at ERA and enable the Authority to execute its mandate more efficiently.

6.1 Salient features derived from the objective and terms of reference

1. **The need to improve reporting by licensees through revision of the reporting instruments named Reporting Schedules**
2. **The need to organise and share data used in managing major mandate functions through designing a data storage and analysis system and creation of centralised storage areas on a server with controlled access levels**
3. **The need to improve on team collaboration workflow and tracking of work progress using the intranet as an internal information sharing and task assignment portal**
4. **The need to have a clear approach to use of IT resources through development of an IT Policy**
5. **The need to access important information on what is available in the library and registry by computerising the data management in both the library and registry**
6. **Improving the external image of the Authority through redesign of the Web Site**

6.2 The Consultant's input

The consultant has tackled the objective through applications, utilities and programming that has implemented several functionalities in the IIMS to operationalise the objective.

This chapter contains comparisons between the situation obtaining before the consultancy and what is obtaining after the consultancy.

The table on the next page outlines the major functional and operational differences between what was realisable before the project and what is possible and available after the project implementation.

Issue	Before IIMS	After IIMS	Application/utility/programming
Reporting by licensees	1. There were 3 Reporting Instruments namely Generation, Transmission and Distribution Reporting Schedules. 2. Licensees had to key in data in the Reporting Schedule workbooks by flipping from page to page 3. Licensees delivered hard copy and soft copy of workbooks without security coding	1. The original reporting Schedules were revised 2. Additional Schedules for Gen-Thermal, Gen-Hydro, GDS, UEGCL, UEDCL and UETCL were developed 3. A data Capture utility for all categories of licensees was developed to enable user friendly reporting 4. A security format for delivering Reporting Schedules via email has been formulated	1. Revised Reporting Schedules 2. Data Capture Utility for licensees 3. Security email delivery format
Storage of Reporting Schedules	1. A directory for saving Reporting Schedules was in existence but consolidation of data was done manually 2. Data remained in a vulnerable Excel format 3. Report Generation from the Schedules was manual	1. Structured Directories for storing Reporting Schedules have been defined 2. Reporting Schedules are uploaded into an SQL database for further protection 3. Report generation is now automated.	1. Reporting Schedule Data Capture and Analysis System 2. Shared Directories and File naming guidelines

Issue	Before IIMS	After IIMS	Application/utility/programming
General Information Storage and Sharing	1. No defined Information Storage and Sharing 2. Individuals kept information on their workstations	1. Individual, Departmental and Company folder structures defined and implemented 2. File and directory naming defined 3. Centralised storage for shared information created 4. Search for shared documents made easy with a web based Soft Document Manager	1. Shared Directories and File Naming Guidelines 2. Creation of Individual, Departmental and company folders on the Database Server 3. Soft Document Manager
Intranet and workflow	1. There was no intranet 2. Workflow was manual or via email with no tracking	1. An Intranet has been created 2. The intranet enables: • Tracking workflow through task assignment • Sharing common documents like forms • Sharing pictures • Sharing Calendars • Sharing discussions • Carrying out surveys	1. Intranet with alerts 2. Routing documents from within MS Office Applications

Issue	Before IIMS	After IIMS	Application/utility/programming
Library/Registry Automation	1. There was a library/Registry Database program accessible only by the librarian 2. Borrowing and returning material from the library/registry was manual 3. Tracking borrowed material was manual and very tedious	1. A New Library program has been installed which is accessible from any computer on the ERA LAN 2. Patrons can search and see listings of what is available in the library/registry/permits 3. Borrowing materials in now automated 4. Tracking borrowed material is automated 5. Borrowers can receive emails regarding unreturned materials 6. Borrowers can book materials in circulation via mail to the librarian	1. New Library Software 2. Library Policy

Issue	Before IIMS	After IIMS	Application/utility/programming
Web Site	There was a Web Site with limited functionality There was no feedback provided for visitors to the web site	A new Web Site has been implemented that has the following attributes •Multilevel menu •Feedback page •Statistical page •Calendar •Power Saving Tips	1. New web site 2. New hosting Service provider

7. Specific examples of improved performance functionality of the IIMS

7.1 Team Collaboration via the Intranet

The key to collaboration is for all intranet users to enable **alerts** for major collaboration tools on the intranet. These include:

- Tasks
- Announcements
- Events
- Meetings
- Surveys

7.1.1Tasks

Using the Intranet, any team member can assign a task to other members with whom they are collaborating on an assignment. The Task can be assigned to a specific member but using the description part, other members are listed.

As soon as the task is assigned, the team members receive a notification mail without the originator bothering to send mail out.

The beauty of this mode of collaboration is that the originator of the task can set timelines for the start and completion of the task, attach required documents to help in the task process and monitor the responses by simply visiting the intranet to see who has responded to the task and how far they have progressed. A time stamp indicates the date and time the responses are made.

7.1.2Announcements

Again using the intranet, any member of the organisation can post announcements on the intranet for the benefit of each user. Notification mails are automatically broadcast to members who have enabled alerts

7.1.3Events

Upcoming events for the organisation can be posted on the intranet for the benefit of all. Events posted indicate the title of the event, the time and location of the event. The person posting an event or that one reading the event can attach useful information to the posting using document attachment

As before, notification mail is automatically sent to all who have enables alerts for events

7.1.4Meetings

The CEO has been provided with a meeting management tool on the intranet. Using this tool, the CEO will invite people to meetings and track their responses trough the Attendee tool which enables invitees to state whether they will be able to attend the meeting or give reasons for not being able to do so. The meeting tool allows the originator to attach documentation that is useful for the meeting.

7.1.5Surveys

Any user who wishes to poll an opinion or collect data on an item can use the Survey tool on the intranet to obtain responses from the other intranet users.

7.2 Team collaboration through Document Routing

With the upgrading of Office applications to a uniform Version (Office 2003 Enterprise Edition) all users are working on a common platform. Moving documents from one user to another cannot cause version degradation.

This allows for teams working on a document to move the document from one team member to another in a orderly and organised way such that it is easy to track the contribution of each team member.

Routing allows for sequential or parallel distribution of documents. It also provides for tracking changes, comments etc and allows the originator to request that the last person or all persons who have accessed the document return it to him/her.

7.3 Sharing vital information through the intranet

7.3.1 Shared Documents

The intranet has a Shared Document page where documents for common use can be uploaded.

Any user is free to post to the intranet under the Shared Documents tool a document in any format (Excel, Access, Word, Adobe Acrobat etc) to be accessed by all interested users. .Once a document is posted on the Shared Document Page, users can view and save copies for their own use without having to know where it is physically located.

7.3.2 Common Form Library

The intranet has provision for uploading electronic versions of forms that are used regularly by staff such as leave application, loan application and salary advance application forms.

The availability of these forms on the intranet enables any staff member to download and fill them out without having to request the forms from whoever is supposed to keep them.

More conveniently, the filled form can be sent by mail direct to the person authorised to process it. It can be routed to more than one person in sequence or in parallel depending on the processing and approval requirements.

7.3.3 ERA Activity Photos

This page enables members to post photographs taken at major events so that other members may view, download and print copies for themselves.

The photos can also be used by staff in preparing reports on events that have taken place in the organisation such as seminars, conferences etc

7.4 Sharing Vital Data and Information

7.4.1 Reporting Schedule data for licensees

With the implementation of new Reporting Schedules and the Reporting Schedule Data Capture and Analysis System Application, reporting information is now stored in a multi-user multi-access system which allows all authorised users to access the data and generate the required reports for inclusion in their analysis and regulation documentation.

As the database grows, a clear and well established database will be in place which can be interrogated using available tools

7.4.2Shared data folders

Individual users, departments and the entire organisation has been granted space on the Database Server for storage of data in the form of documents, reports etc. An access policy restricting who accesses what has been implemented and this enables controlled access to vital information needed in the regulation function of ERA.

An indexing system for shared documents residing in folders has been designed and installed for use by those authorised.

7.4.3Library/Registry automation

The computerisation of the Library and Registry has made it possible for users to access the databases for both book and document holding centres.

Enhanced features include:

- Inclusion of pictures/photos of the cover page for books
- A database of patrons (borrowers) who are automatically linked to borrowing and circulation reports

Users can view the status of a document in terms of whether it is available for loaning out. A convenience search facility based on parameters like Author, book title, Publisher etc is possible from every enabled desktop computer.

An email utility integrated into the library software enables users to book books and other material by sending mil to the person in charge of the library.

The computerisation of the library has also enabled the issuance of permits to be recorded in a historical database.

Enhancements include:

- Appending photographs of permit holders to the permit applicants record
- A historical record for renewals
- A consolidation of application, processing and permit issuance details in a single electronic file

7.4.4Publishing Interactive Statistics on the web

The ERA website now holds a very wide range of statistical data on the electricity sector. Using pivot tables and worksheets saved as HTML documents and uploaded to the web site, visitors to the web site can view statistical information for using different parameters.

The web site also has an Administrator logon interface that allows the person in charge of the website to update information directly on the web.

A host of improvements have been made to the website including assign Frequently Asked Questions (FAQs), Web mail, and Energy Saving tips.

The entire look and feel of the website has undergone tremendous change to bring it in line with current website design trends

8. Recognising the new potantial

8.1 Available resources

ERA has invested substantially in IT infrastructure and software during this project. A number of applications have been installed on the LAN, some off-the-shelf and others developed by the consultant.

The combined power of the infrastructure based on very high end servers running Windows Server 2003 R2 Enterprise Edition, SQL Server 2005 and the implementation of a collaborative Intranet offers ERA staff an arsenal of production tools which must be exploited and utilised to realise the dream the Authority.

8.1.1 Collaboration

Inbuilt collaboration tools in Microsoft Office Professional 2003 via Outlook 2003 which enables routing of documents for review to team members either directly via mail or through the Intranet offer a big opportunity to reduce the time required to complete assignments.

The Intranet implemented for ERA is quite different from conventional internal websites run by most organisations. By design the intranet can be used by anyone with reasonable IT knowledge as contribution of articles, tasks, events, shared documents does not need use of the dreaded html or Java programming. Contributions are made in standard office productivity tools like Word, Excel, Access, Power point etc.

8.1.2 Data Management and sharing

The creation of data Capture and Analysis Application has made the following contribution to data management.

1. Quick electronic uploading of data
2. Centralised data collection
3. Quick report generation

The creation of shared folders has also provided the staff in each department with the opportunity to centrally store documents, data etc which id of common interest in one location. The Soft Document Manager Application makes it easy to locate and use documents and other data.

8.1.3 Library/Registry Automation

Automation of the library/registry has unleashed functionality that was not available before. Users can book and get material from the library/registry while working from their desktops. One does not need to walk to the library to find out if what they want is available or loaned out. All this information is available without even the intervention of the librarian.

8.1.4 Soft document Manager

Another bespoke application developed by the consultant in the Soft Document Manager. This application enables ERA to create an index of selected shared soft documents and control access to the documents through password and user type levels.

The Soft Document Manager enables quick search and retrieve of all documents in the repository

9. The Way Forward

The IIMS project has introduced many features whose technology was not initially available at ERA. To utilise these features to the full realisation of the investment, calls for training beyond the scope of what was provided for in the project.

Although there was training to cover all aspects of the newly introduced functionalities in the LAN, the consultant has received comments in corridors of staff who wish to get deeper knowledge in using the potential. Through interaction with the users, we have discovered that contrary to the responses we received from members of staff regarding their competences in Microsoft Windows and Microsoft Office Automation software, many of the staff can hardly utilise 20% of the power of these tools.

9.1 Project Evaluation Taskforce

We recommend that ERA puts in place a taskforce to monitor the IIMS project in order to evaluate its impact on the workings of the organisation

Among the things the taskforce should look for we recommend:

1. User awareness of the facilities introduced by IIMS
2. User understanding of the functionality of these facilities
3. User usage of the facilities in place
4. Difficulties experienced by users in using the installed facilities
5. Need for further training in use of facilities
6. Internal capacity to enhance installed facilities

9.2 Deliberate policy to use available resources

To encourage the use of the installed resources, the Heads of department should spearhead use of the installed facilities. Heads of departments should as far as possible allocate assignments to their team members using the installed collaboration tools.

9.3 Need for further training

Further training in the use of MS Office 2003 should be encouraged so that on average each member of staff reaches the Intermediate Level of competence while those who are involved in interrogating data and generating reports should train to advanced levels in Word, Excel and Access.

A more rigorous training of the use of the Intranet and its linkage to Microsoft Outlook Calendar and routing should be availed to those who are involved in collaborative work especially in the regulation departments.

9.4 Enhancing user support

In order to provide high level in-house user support, the skills of the two people responsible for this function need to be enhanced.

The Data Entry Operator and System Administrator should be availed the opportunity to train in Advanced Access, Excel, Visual Basic, Dot Net2 and other tools that the consultants have used to develop the bespoke applications in the area of data and document management.

This will enable these two people to offer better support to users and be able to define and program other reports from the database once the consultant leaves.

As we close this project we are happy to report that the Data Entry operator has with our training assistance acquired skills to generate reports from the Reporting Schedules Database.

9.5 System Growth and Enhancements

The installed IT capacity at ERA offers a formidable productivity platform limited only by skills and imagination.

9.5.1 Improving the Intranet

The Intranet as an internal collaboration and information portal is a very powerful tool in reducing paper circulation and improving delivery time for assignments. This resource, combined with the available shared data can completely change the working habits of ERA.

The current features of the Intranet can be greatly increased if the IT support staff acquire the knowledge to add new components to, and built interactivity into the system.

9.5.2 External access to the Intranet

Enhanced training in system security and access control will not only bring out more of the powers of the intranet but make it available to ERA staff who may away from the station through **Virtual Private Network Remote Access**.

This feature though desirable has not been implemented for the following reasons

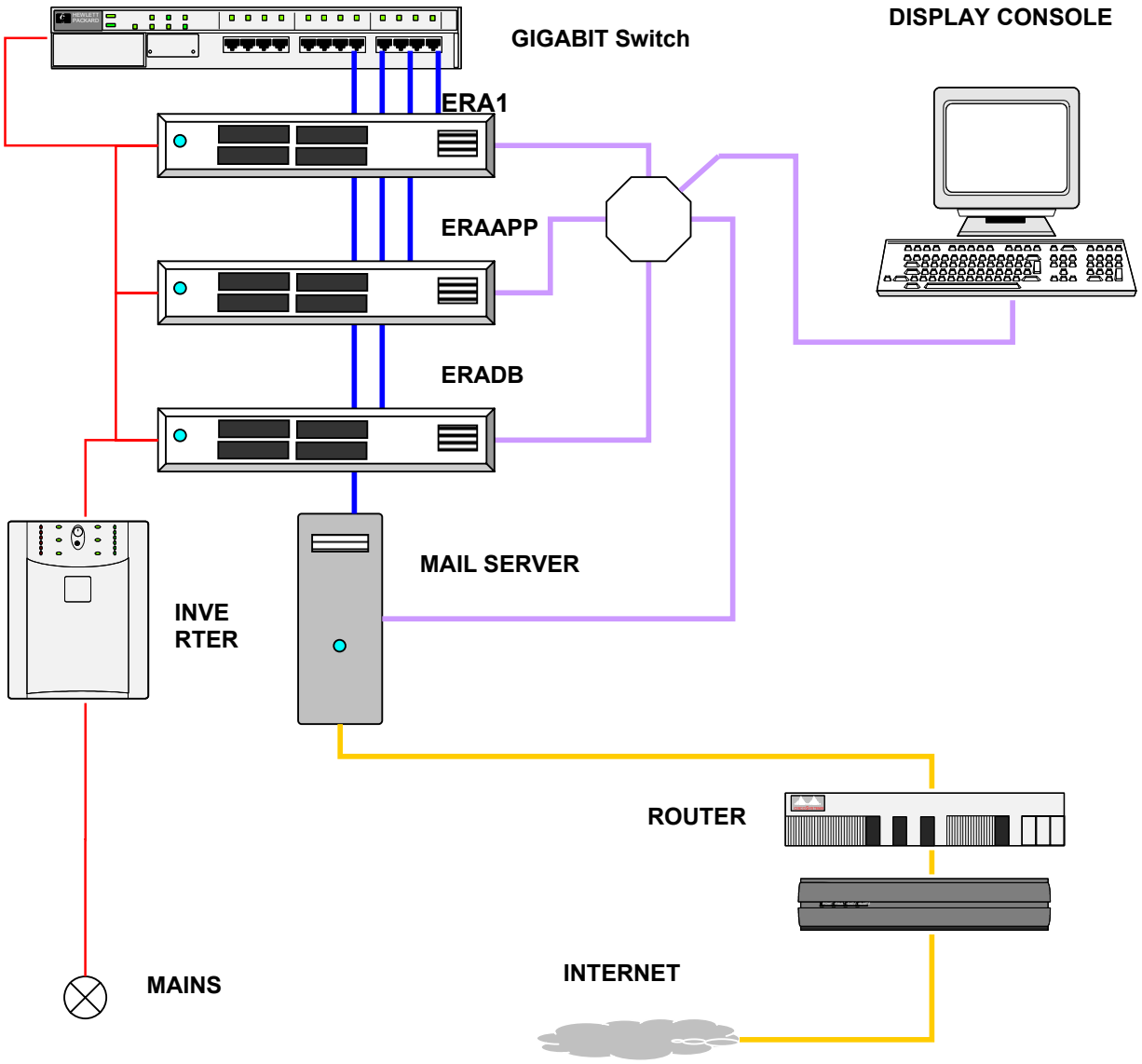
1. It was not a specific requirement under the TOR
2. Its use requires high skills in monitoring security of access to the ERA LAN and this capacity is yet to be developed

It is a good point to consider for future implementation after users become more familiar with the use of the current facilities

9.5.3 Using InfoPath to build interactive data collection and sharing

One of the components of Microsoft Office 2003 is an application called InfoPath. This is a powerful Web based data collection and sharing application programming tool.

With the Internet and Intranet in place, ERA would benefit from the use of this tool which is already acquired. This however needs specialised training as it is a new component of Microsoft Office application suite and few have attempted to use it. It requires good Database skills.



Appendix A: Interconnection of hardware in the Rack

Appendix B: List of Key Documents, Reports and Applications

Item	Description	Delivery Format	
		Hard Copy	Soft Copy on CD
1	Project Final Report		✓
2	Soft Document Manager Application		✓
3	Reporting Schedules Data Capture and Analysis system		✓
4	Reporting Schedules Data Capture Utilities for GDS, Gen-Thermal, Gen-Hydro, Generation, Transmission, Distribution, UEGCL, UETCL		✓
5	Manuals for above Data capture utilities	✓	✓
6	Routing Collaboration Guidelines	✓	✓
7	Data Analysis User Manual	✓	✓
8	Intranet User Manual	✓	✓
9	Soft Document User Manual	✓	✓
10	Reporting Schedules for GDS, Gen-Thermal, Gen-Hydro, Generation, Transmission, Distribution, UEGCL, UETCL	✓	✓
11	Share Folder and File Naming Guidelines	✓	✓
12	Library Draft Policy	✓	✓
13	Hardware and software specifications	✓	✓
14	Database Design	✓	✓
15	Reporting Schedules Report definitions	✓	✓
16	IT policy	✓	✓
17	IIMS Final Design Report	✓	✓
18	IIMS First progress Report	✓	✓
19	IIMS Inception Report	✓	✓
20	Several Power Point Presentations		✓