

**The ETC CIMIS Implementation (released for ETC's Master Plan study)**

The "As-Is" study has shown that ETC's business is constrained from transforming itself into industry standard practice because of a multiple of factors. Some of these factors are related to the restriction of the business practice in place, some relate to the restriction in the organization and the organization culture and still some others relate to restriction in the information system in place.

The High-Level Requirement document has outlined the broad improvement initiatives ETC must undertake to modernize its operation. In essence, this document has shown the gaps that need to be filled to transform ETC into a modern, industry standard telecom services provider.

The implementation challenge arises out of the immensity of this gap and the change effort implied thereof. Comparison of the collection of existing Business/IS capabilities and the "to-be" Business/IS capability suggested in both the High-Level Requirement document and the more detailed CIMIS Design and Specification document reveal the immensity of the change effort required.

**Comparison of Existing Capability and Recommended Capability**

A very high-level comparison of existing Business/IS capabilities and recommended Business/IS capabilities in terms of basic Business/IS components is attempted here, in tabular forms, to show the extent of the gap between the two.

<b>Business/IS Components</b>	<b>Existing Capability</b>	<b>Recommended Capability</b>
Financial Management	Corporate Finance and ITCD Driven, Provides scanty snapshot of Corporate Performance	Decentralized, User Driven, Cost/Profit, Project Center Oriented, provides multi-level performance( regions, zones, areas) snapshot and allows extensive roll up to Corporate level.
General Ledger	Corporate Finance and ITCD Driven, unstructured and non-standard	Decentralized, User Driven, incorporates location and transaction code for budget and cash management and is industry standard
A/Receivables Management	Non-Existent	Service and Customer based Receivable management system broken down by cost/profit center, with extensive facilities for bad debt and provisions management; directly integrated with G/L and collection module
A/Payables Management	Non-Existent	Integrated with Purchasing and Inventory Management and Cost/profit center oriented, integrated with G/L

Budget Management	Manually Operated (preparation and tracking) and Corporate Finance Driven	Automated Budget Preparation and Tracking, linked with project and operation funding, cost/profit/project center oriented and integrated at the G/L level
Cost Accounting	Non-Integrated, manual system	Integrated system that ties, G/L, purchasing, inventory, budget and project management systems.
Cash Management.	Nearly non-existent	Enterprise-wide cash management system
Fixed Assets	Manual System	Automated system reporting to the G/L
Billing, Customer Care and Collection,	Bill Oriented and of Limited Capacity	A full-fledged and end-to-end system that covers key billing, customer care, facilities management and control functions
Purchasing, and Inventory Management	Manual and non-integrated System	A fully automated system that ties the purchasing and inventory management process and reports to the G/L
HR Management	Nearly non-existent	A fully automated system that manages the full spectrum HR function from recruitment to retirement
Project Management	Nearly non-existent	A fully automated system that covers project functions inception to capitalization
Transportation and Logistics	Nearly non-existent	A fully automated system that manages resources in the custody of the transport division
Data and Information Exchange	Paper based	E-mail, e-forms and EDMS oriented and based on enterprise Intranet
Data warehouse	Non-Existent	Extensive Data ware house facility to support strategic planning and marketing efforts of ETC
Application Architecture	Centralized, Mainframe driven	Three-tier distributed system based on client/server model
Communication Architecture	Very rudimentary Communication between the IT Center and the regions, zones	Robust LAN, WAN, CAN communication model aimed at forging business integration
Data Architecture	No Standard	Based on RDBMS and Recent Data Management Technology Standards and tools
Security Architecture	No Standard	State-of-the-art Security Model supportive of the Distributed Business/IS management paradigm
System Architecture	Rudimentary	State-of-the-art System Management Model with extensive help-desk, remote services, applications, network and infrastructure coordination tasks
Platform Architecture	Mainly Mainframe based and very limited host links	State-of-the-art platform model based on open system standards,

		application, database, e-mail, file and print, WWW, network management servers and host clients.
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As can be seen from the above table, most of the capabilities implied in the CIMIS recommendation, that is capabilities relating to applications, general IT infrastructure, platform and service components, are either non-existent or exist at a rudimentary level, in ETC. The implication of this is that, the ETC modernization effort requires the commitment of huge resources, intensive project planning, control and monitoring and extensive capacity building.

Capacity building is the first and more serious challenge that the ETC modernization effort will pose. None of the skill sets required to implement the recommended CIMIS initiatives nor the skill sets required to use the CIMIS deliverables are outright available in-house. This applies to most of the business applications and infrastructure components required to launch the CIMIS initiatives.

A modernization effort of the size suggested by the CIMIS recommendation implies the availability of the following resources:

- Project manager (s) for each of the key initiatives,
- Business analysts,
- Technical architects ( infrastructure and environment),
- Business process and change management manager (s),
- Business process and change management analysts,
- Configuration analysts and technicians,
- Technical support,
- Training staff and related support staff,
- Database administrators,
- Data administrators,
- Documentors
- System administrators, and
- Administrative support staff.

Even if most of these resources are contracted from outside sources for the duration of the CIMIS project implementation, as they should be, *the question of capacity building for the ownership of the CIMIS project deliverables after hand- over remains of crucial importance.* ETC needs a very solid team of application

and business specialists, database managers, data administrators, network managers, system managers, platform managers, service managers administrative support and help-desk managers, who can take over the project after implementation.

Graduating or fast-tracking management and users to a level where they can use the implemented CIMIS initiatives itself is another daunting task. The level of confidence required for ownership and meaningful use of the kind of initiatives recommended for ETC CIMIS require time and persistence to take root. This in itself is another challenge.

The third challenge relates to the size, scope and complexity of the CIMIS project. The recommended ETC CIMIS involves five key components each of which contains other important sub-components ( 23 sub-components as a whole). These are:

(1) The enterprise infrastructure (the backbone on which key application components are layered), which includes the following sub-components:

- Communication Architecture (LAN, CAN, WAN)
- Data Architecture (Database, Data Tools, Data Management...)
- Security Architecture ( Privacy/Confidentiality, Access Control, Authentication..)
- System Architecture (Help Desk, Asset and System Management...), and
- Platform (Data Center, Servers, Clients and other devices).

(2) Core financial systems-FMAS, which includes the following sub-components:

- General Ledger,
- Receivables,
- Payables/Payment,
- Fund/Budge Management,
- Cost Accounting, and
- Cash Flow Management.

(3) Other non-financial and mixed systems, which include the following sub-components:

- Billing, Collection and Customer Management,

- Purchasing, and Inventory Management,
- HR,
- Project Management
- Fixed Asset
- Transportation and Logistics,

(4) Enterprise information systems, which include the following sub-components:

- Intranet
- E-mail, Calendaring and Scheduling
- E-forms, and
- Electronic Document Management Systems.

(5) Shared systems (applications that facilitate data sharing, routing and interrogation). Which include:

- Workflow, and
- Data Warehouse.

The five key components in general and the 23 sub-components in particular require extensive resource, project planning and implementation monitoring.

It is obvious that besides the huge capacity building required, to bring to fruition the CIMIS initiative, resource constraints and complexity of the project will not allow the implementation of the initiative in a fix.

### ***Prioritization of CIMIS Initiatives***

The 5 key components and the 23 sub-components together constitute the total CIMIS initiative that must be undertaken to achieve the modernization of ETC and to bring ETC to an industry standard telecom service provider. As indicated, these CIMIS components are expansive and intensive in resource and skill

requirement. Even more important, they can not be fixed in one go. Put otherwise, they can not be lumped as one grand project.

Some of these CIMIS components are purely technological, while some others relate to business processes and process reengineering; some relate to work and work group organization while some of the remaining components relate to work force retraining and enterprise reorganization or a combination of the above.

The implementation trajectory and critical success factors of nearly all of the key components is different. The risk profile of each component and the benefit derived is also different. The complexity of the change elements involved and the variability of risk and benefit attributes of the components renders the lumping of all the CIMIS components in to one grand project impossible. Lumping all these component together is also bound to increase the risk of failure.

Comparable initiatives in similar environment and enterprises in other sectors indicate that, the kind of initiative that ETC must undertake is time-intensive, as well. Start to finish, the CIMIS initiative, given the commitment of top echelon ETC executives and sponsorship, availability of resource, commitment of ETC staff, proper planning, knowledgeable integrators, committed vendors, etc., will take 30-36 months.

Under the circumstances, it is imperative that the CIMIS initiative be broken down (prioritized) to manageable (smaller) yet interlacing components over the stretch of time it is required to bring it to gestation. This approach has also the advantage of reducing technology and implementation risks. It is also important, while breaking down the CIMIS initiative to executable (smaller) projects, that independent project plan be drawn for each project with clear start and finish line of each project and a meaningful contribution measure of each project towards ETC's grand technology and/or business vision. It is necessary that each of the executable projects designed as such should show concrete and visible payoffs and or "small wins", at conclusion.

In view of the above, the following implementation prioritization are recommended:

### **Phase 1 -Building the Enterprise Infrastructure and Common Services**

The enterprise technology infrastructure is a very essential component or backbone of ETC CIMIS. The Ideal ETC enterprise infrastructure shall endeavor to inter-network all HO organs, Zones, Regions, Area and Sub-Area offices, and allow them access to, depending on the enterprise access rule, data, information and knowledge necessary for running their operation and help them make their due contribution to the fulfillment of the enterprise mission.

Phase 1, building of the initial ETC backbone infrastructure, however, will focus on interconnecting all the H. O organs scattered throughout Addis Ababa, all Zonal Offices in Addis and all the Regional offices. These offices will integrate their respective LANs into Campus Area Network (CAN) and Wide Area Network (WAN), to share the use of common services.

During phase 1, besides the enterprise backbone infrastructure, the inter-networked ETC offices shall use Internet for common office communication, exchange of information and solicitation of services. The backbone infrastructure shall also support, during phase 1, an enterprise Intranet which shall be used to publish and distribute common and necessary information which have relevance for day-to-day operation. These could involve all the policy and operation manuals available in ETC, telephone directory, guidelines for using the internet and the intranet, etc.

Minor initiatives which involve the use of MS Word or Excel or Access Macros for deploying e-forms and other feedback reports may be undertaken by ETC's own IT staff during phase 1. This will certainly pave the way for the more extensive implementation of industry standard e-forms and document management system.

## **Work Involved During Phase-1**

Major work involved during this phase include:

### **Technology Related:**

- Sizing up and up-grading the ETC Data Center to serve as a spring-board for phase 1 implementation ( acquisition of central Internet and Web servers, SW and other equipment) ,
- Deployment and fine tuning of Local Area Networks (LANs) in the following sites ( procurement of necessary equipment for a LAN, cabling and connecting users inside the given LANs):
  - Ethiopian Telecommunications Corporation Head Office,
  - Filowha Data Center,
  - All Zonal Offices of the Ethiopian Telecommunications Corporation,
  - All Regional Offices of the Ethiopian Telecommunications Corporation,
  - Administrative and Operational Offices of the Ethiopian Telecommunications Corporation located in Addis Ababa (Denbel Building, Insurance HO building, ETC Training Institute, Ware Houses...),
- Deployment and fine tuning of Wide Area Networks to connect the following sites to the Data Center (procurement of equipment necessary for remote communication and connecting indicated sites):
  - The Ethiopian Telecommunications Corporation Head Office,

- All Zonal Offices of the Ethiopian Telecommunications Corporation,
- All Regional Offices of the Ethiopian Telecommunications Corporation,
- Administrative and Operational Offices of the Ethiopian Telecommunications Corporation located in Addis Ababa (Denbel Building, ETC Training Institute, Ware Houses...),
- The various bill collection centers,
- Acquisition of enterprise wide collaborative SW and deciding on enterprise wide productivity SW (e.g. MS office Suites, publisher SW, project and other enterprise SW),
- Establishing access and security profiles for the enterprise system, etc.

### Soft-Skill Related

- Upgrading the skill of the IT center staff ( in LAN, WAN, CAN build up and system administration and platform management);
- Upgrading the skill of the IT center staff in enterprise Internet/Intranet Administration ( training Administrators, Publishers, Editors, Authors, Web masters, etc),
- Training of users (staff and management) Internet/Intranet, e-forms and inter-office communication tools, and
- Training users on computing basics and other office productivity tools.
- Training for the rest of the projects that will follow after phase 1 (phase 2 through 3).

### Phase 1-Targeted Achievements

Phase 1 of the CIMIS project is more or less a nuts-and-bolts kind of project whose achievement metrics can be pretty straightforward.

**The first and crucial aim of phase 1 is capacity building at the IT or Data Center level. ETC need to revamp and upgrade the role of its IT department. In view of the vast and important responsibility it is designated to play, it should be reorganized to reflect its new stature and responsibilities. In many organizations the IT function is a core function which reports to the Managing Director or to the President. Although we shy away from organizational role assignments, it is strongly recommended that the IT function be reorganized and managed at the D/management level or CIO level, or what ever name that is appealing to ETC nomenclature, and directly report to the Managing Director. The reorganization should be pervasive and involve the assignment of key IT operatives in the area of system management, networking, platform and database administration.**



The capacity building at the IT function level should focus on both phase -1- related project areas as well as long-term CIMIS project related skill areas such as, business specialists, database managers, data administrators, network managers, system managers, platform managers, service managers administrative support and help-desk managers. The capacity building at IT function level is very critical as it constitutes the first important landmark that need to be staked by ETC towards the implementation of the CIMIS project. Nothing can be successful without the successful completion of this important milestone.

The second aim of phase 1 of ETC CIMIS project is the building and erection of the infrastructure that will be supporting all of ETC's immediate and on coming project components. Although this portion is more of a physical implementation, it is the first step that ETC needs to take to build an enterprise-wide network and live with the consequences of such a facility.

The third aim of Phase 1 is fast-tracking and/or exposing ETC users ( staff and management) to modern technology through drill and real but less skill-intensive applications. Applications like the Internet, basic office productivity tools like MS Office and other tools are short-cuts to the more skill-intensive applications like ERP systems and other systems recommended to constitute the ETC CIMIS. As all applications, ERP or otherwise, are made to follow constant user-interface requirements, graduating ETC users at all level from productivity tools using GUI to more advanced systems will be productive, than throwing them to use systems which require basic computing and application knowledge skills at the same time.

### **Timeline for CIMIS- Phase 1**

As indicated, phase 1 involves, complex but physical erection of an enterprise infrastructure and capacity building both at the IT function and staff and management level.

The technology related project of phase 1, excluding procurements of goods, shall take a maximum of 120 days. Soft-skill related work, may take longer duration depending on the profile of the staff that shall be involved in the training. Usually, the IT function related capacity building, if it is an in-house development effort and organization oriented, may take form 180-210 days. This includes the setting up of the user-desk, Data Center facility management procedure, etc.

The user portion of capacity building is easier and must focus on giving the basic computational skills and letting the users achieve proficiency through on the job training and drill.

A worst-case scenario and consideration of concurrent activities will suggest a time-line of around 180 days for phase 1 of the CIMIS project.

## **Phase 2 - Core Enterprise Resource Planning (ERP) and Billing and Customer Care and Collection Automation**

The total ERP implementation initiative recommended for ETC CIMIS project encompasses 12 business functions grouped both under the core financial system and feeder or non-financial systems. It covers the following business function areas:

- Financial Management/Accounting system (FMAS), which includes
  - General Ledger,
  - Account Payable,
  - Account Receivable,
  - Fund/Budget Management,
  - Cost Accounting,
  - Cash Flow Management,
- Feeder Systems, which include
  - Billing, Collection and Customer Management,
  - Fixed Assets,
  - Purchasing and Inventory Management,
  - Human Resource and Payroll Management,
  - Project Management, and
  - Transportation and Logistics Management.

The second phase of the CIMIS project, however, aims at automating the core business functions of ETC, namely, the FMAS and the total billing and customer care vehicle required by ETC. This phase of the project heralds the modernization of the core enterprise financial management and the ETC service/revenue accounting systems. Other ERP applications indicated under the feeder system, such as purchasing and inventory management, HR, project Management and Transportation and Logistic Management are left out for another phase. This is done basically to mitigate risk and properly control milestones which can readily be aggregated for collective implementation.

It is essential to include the implementation of the billing and customer care application at this stage because it has components that must readily interface with the core financial system, such as G/L, cash and account receivable. **It is also important to aggregate the implementation of the core financial system and the billing and customer care applications in order to assure the availability of a prime vendor which can take the total responsibility of laying down the basis for the enterprise integration process, across key applications. These avoids complications, going forward, about interface and integration**

of the two basic systems. For practical purposes, these two applications are core functions whose implementation should go hand in hand and must be overseen by a single vendor.

## **Work Involved During Phase-2**

Major work involved during this phase include:

Technology Related:

- Readying the ETC Data Center for ERP implementation ( acquisition of application and database servers for both the core financial and the billing and customer care applications)
- Acquisition of the appropriate ERP and billing and customer care application.

Implementation Related

The implementation related work is more intensive at this phase and requires a thorough understanding of the nature of ERP or other business impacting applications and readying an enterprise for the implementation consequences. Depending on ETC strategy, the work in this phase could cover implementation aspects starting from business design to post-implementation support and or outsourcing of support for a duration.

The implementation team that represents the vendors/integrators and ETC is established, roles are assigned to both, relationship and interface procedures are defined at this juncture. It is expected that ETC has readied, through capacity building and training, the project team that will support this phase of the project implementation.

The key work processes involved at this phase include:

**Business Process Architecture**

**Business Requirements Definition**

**Business Requirements Mapping**

## **Application and Technical Architecture**

### **Module Design and Build**

### **Data Conversion**

### **Documentation**

### **Business System Testing**

### **Performance Testing**

### **Adoption and Learning**

### **Production Migration**

#### **Soft-Skill Related**

It is assumed here that ETC, during phase 1, has undertaken a pervasive training, that will help it support this phase of implementation. As such, the training required at this stage primarily shall focus on users and process managers. Training in this phase will focus on:

- back-room IT staff who manage and support the two applications;
- help-desk staff who will render internal-customer support for the two functions,
- creating a cadre of business specialists on the ERP and billing and customer care system,
- on assuring the availability of core and adequate number of trainer of trainers (ToTs) for both application, and
- on enterprise-wide training of the facilities available in the new systems.

#### **Phase 2- Targeted Achievement**

This phase of the project aims at transitioning the whole of ETC's financial and billing customer care application to the new platform and assuring that these enterprise resources are adequately understood and

used by ETC staff. It is at this phase that all of the ETC HO organs, Regions and Zones transfer their data from their legacy and manual systems to the new applications and validate the proper transfer of key data.

Phase 2, among other things, is targeted to achieve:

- the deployment of one global ERP/billing product that meets all local, regional, and enterprise requirements and allows ETC to run each and every part of its country and enterprise-wide financial/billing operations, and can handle it all. The new platform will support local business practices and legal requirements, and handle business critical operations across events, using the same software.
- Modern and industry standard IT network and hardware infrastructure to effectively and efficiently support ETC's internal operations such as Finance, billing and customer care application, at the HO, Regional, and Zonal level,
- Effective integration between existing operational applications, including the operation of offices which are not automated or to be automated;
- Streamlining of functions currently performed at the department level and duplicated at the financial service level due to system limitations;
- Integrated technologies and a single vendor for applications, database reporting and development tools; common platform for administrative systems, one sign-on, and common training;
- A robust and common chart of accounts; and
- Elimination of duplicate data entry between systems,
- Cash management system which takes into consideration collections, disbursement, appropriations and other cash transactions based on ETC's cost/profit centers requirement.
- Capture of the full customer profiles, maintain receivables data and possess an intelligence that will facilitate grouping, calculation and reporting of receivables by age,
- A global and convergent billing system for all types of services ETC provides to its Customer, capable of capturing the inputs directly from different types of switches, which ETC has...

## **Timeline for CIMIS- Phase 2**

This phase of the project may be time intensive and very tricky to manage. It is an absolute must that ETC prepare itself for major business changes and these changes be championed at the highest management echelon. Most implementation of these nature go through a three-cycle staggering, which

involve pre-implementation, implementation and post-implementation cycles. The pre-implementation cycle is usually devoted to selection of integration and oversight partners, teaming of internal resources and other critical pro-project preparations. The implementation phase involves the work processes indicated earlier. Post-implementation involves the insurance that enterprises that have implemented pervasive applications would like to buy to ensure continuity.

The pre-implementation and the implementation phases may take 12-18 months. The billing and customer care application may take less time than indicated here. But the ERP implementation may take even longer time. The time depends on the experience of the integrator and the kind of business stance ETC takes post acquisition of the application SW. If ETC would not want the available business templates in the applications and would rather choose the application fit into its business system, the project time may get longer. Usually, it is advisable that the available business templates rule the post-implementation business procedure.

A worst-case scenario for the ERP application is around 24 months. The same scenario for the billing application may not exceed 12 months.

### **Phase 3 - Completion of the ERP and Common Services Automation**

This phase will round up the implementation of the ERP and common services automation components incorporated in the CIMIS initiative. It is a milestone which, at least, heralds the execution of all the initiatives recommended to modernize ETC.

The focus in this phase will be the implementation of :

- ERP systems
  - Fixed Assets
  - Purchasing and Inventory Management,
  - Human Resources and Payroll Management,
  - Project Management
  - Transport and Logistics Management,
- Common Services
  - E-forms
  - Electronic Document Management System (EDMS), and
  - Data Warehouse.

As the major initiatives which pose technology challenges and risk have been tackled in phase 1 and 2, the implementation of the remaining ERP applications and common services may not be difficult. By now also, the ETC IT function and users should have built the requisite technology knowledge that will help them assimilate new additions.

### **Work Involved During Phase- 3**

#### **Technology Related**

- Readying the ETC Data Center for ERP Common Services implementation ( acquisition of application and database servers, especially, for the e-form and EDMS, Data Warehouse applications)
- Acquisition of the appropriate ERP and Common Services application.

#### **Implementation Related**

The implementation during this phase may be undertaken with the integrator/vendor who has implemented the initial ERP application. Just as in the phase 2, a thorough understanding of the nature of ERP or other business impacting applications and enterprise business change is required. Again, depending on ETC strategy, the work in this phase could cover implementation aspects starting from business design to post-implementation support and or outsourcing of support for a duration.

The critical implementation processes indicated for phase 2 also apply here for the rest of the feeder ERP and common services applications. Just as in phase 2, it is important that the implementation start with business process architecture and exhaust processes up to production migration.

#### **Soft-Skill Related**

- Core IT staff knowledge upgrade in support of the new applications to be introduced, and
- Training of users (Management and staff) in the use of the new applications.

### **Phase 3-Targeted Achievement.**

Phase 3, as indicated earlier, is the continuation of the projects started in phase 1 and 2 and, in a way, is also the consolidation of the modernization effort which has been rolling.

As a result of the successful execution of this phase:

- ETC will own, via the data warehouse and instant enterprise data exchange facilities, a better value added marketing vehicle which helps its CSRs and front-line staff to focus on increasing top-line revenues, reducing sales and service costs, producing top performing sales, service and customer support representatives, and maintaining superlative customer satisfaction and retention which results in more profitability.
- Marketing management Information system shall be able to increase effectiveness by tracking all sales data in a closed loop fashion, as envisaged; promotion and event management could be facilitated by targeting qualified prospects, managing demand creation, response processing, literature fulfillment, and tracking campaign effectiveness.
- ETC will have a centralized and networked human resource database system that covers regional and zonal offices and decomposition of this information on cost/profit center basis and its rolling up for consolidation purposes shall be facilitated.
- Strategic planning and project management shall be facilitated.
- Purchase system which covers the complete event from requisition up to complete delivery of stocks and which is integrated with inventory system shall be available. Recording and controlling all the fixed assets acquired through construction, installation, manufacturing and direct purchases;
- A system which allows ETC to manage its fleet assets and account for their usage will be in place.
- Workflow, imaging, and electronic forms (e-forms) would be possible; ETC can increase the rate at which information can be entered and retrieved by individuals or groups, thus enabling better productivity and sharing of information. All of the budget process, feedback received from Zones, Regions and other HO organs can be changed to e-forms and exchanged through an enterprise network.

### **Timeline for CIMIS- Phase 3.**

Phase 3 may take from 9-12 months. Much of the time in this phase may be spent on the deployment of the non-ERP applications which are new to ETC. Especially, the e-form and EDMS applications. Capacity building, during this phase will be straightforward as both the IT staff and users are now at a mature level.