# RAMESES SYSTEMS INC **E-TRACS** Improving Local Government Revenue Systems 2016





# **EXECUTIVE SUMMARY**

E-TRACS (Enhanced Tax Revenue Assessment and Collection System ) is a software designed for local government units (LGU) to improve revenue management and collection. E-TRACS consists of three major modules that address the main revenue-generating activities of an LGU – *Real Property Assessment and Land Tax, Business Permit and Licensing* and Miscellaneous Collections/*Treasury Operations*. Other revenue systems can be seamlessly integrated through a facility called plug-ins like CTC (Community Tax Certificate) or even economic enterprise systems like Waterworks. E-TRACS is designed as a fully integrated platform to enforce consistency in transactions and ease of management.

The system is a multi-user environment using role-based permission to define proper accountability and responsibility for each user. It employs business process transactions that conform to guidelines prescribed by the Commission on Audit (COA) and the Bureau of Local Government Finance (BLGF). It is also designed to address the needs of improving business permit and licensing through streamlining and implementation of a unified form. Through years of research and development, several innovations have been incorporated into the software like esignature and paperless transactions, workflow and rule engines, sms notifications, use of barcodes to speed up retrieval of transactions and cloud connectivity, to name a few.

For an LGU, using E-TRACS not only improves efficiency and accuracy in collections, it also promotes best practice and good governance. If implemented properly, E-TRACS would greatly reduce manual tasks in day to day operations like preparing daily collection remittance reports which can be generated by just a click of a button. It also improves service to taxpayers by collecting salient information and knowing transactions made, also referred to as the KYT (Know Your Taxpayer).

One of the primary differences of E-TRACS compared to other solutions in the market is its focus on sustainability and technology transfer. LGUs that implement E-TRACS are required to have an E-TRACS team who will act as the primary support group. Several trainings are offered for different audiences like end users, administrators and developers to allow them to customize the system to fit their needs. The other support groups include the E-TRACS community of users and finally the developers if the problems cannot be addressed on their level.

E-TRACS is designed, developed and maintained solely by Rameses Systems Inc. (Rameses), a software company based in Cebu City Philippines specializing in local government applications with over ten years experience working closely with LGUs. E-TRACS is distributed as a free software and any LGU can avail of it through grants or through LGU to LGU assistance. The E-TRACS platform is continuously being improved with the help of an active community for feedback. Being a free product for local government units, the cost of development is sustained through membership, trainings and sales of plug-ins and other related services.





# **BACKGROUND AND HISTORY**

E-TRACS is a remake of a project called TRACS (Tax Revenue Assessment and Collection System), which was one of the components of an AusAID-funded project in 2000. There were five recipients of the project namely the cities of Tagbilaran, General Santos, Bacolod, Iligan and Puerto Princesa. TRACS was in a way successful but because of different practices of the LGUs it had its limitation and not all recipients were able to fully adopt it. Since TRACS was developed exclusively on a Microsoft platform, some LGUs who had skills and hardware investments in other technologies were reluctant to adopt it. To cater to a larger user base, Rameses decided to recode everything using java technology, an open platform that can run virtually on any operating system. The goal was to make a product that is highly customizable and adaptable to different practices of local government units and most importantly provide the LGU with choice of technology. In early 2008, the first version of E-TRACS was released.

It is without question that computerization is one of the solutions to help alleviate poverty because not only will it make our systems in government efficient, it would in a way reduce corruption which could attract more investors resulting to jobs generation and growth of more businesses, eventually removing the reliance of local governments on the internal revenue allotment (IRA). However it needs to be stressed that the right solution must be in place, not just any computerized solution. Most systems available in the market are very expensive and a recurring observation is that it is not fully integrated. An LGU would need to buy several modules yet it does not integrate well with each other. This resulted in having islands of automation making consolidation of data difficult, reduces the accuracy and make auditing tedious. It was also observed that most systems lack the security needed for highly sensitive transactions such that one could easily edit the information encoded by another.

The goal of the E-TRACS project is to fill this gap - to provide an integrated system that would enforce best practice and make it available to any local government unit (city, province, municipality or even barangays) who want to improve on the way they do business. No system is perfect and software becomes obsolete, thus a program was conceptualized to make it sustainable to address new requirements and take advantage of new technologies. E-TRACS is the alternative solution on how government acquires computerization.

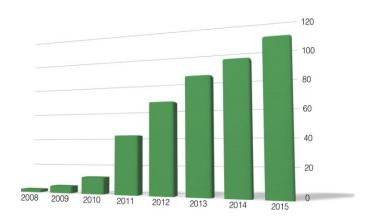


FIGURE 1. INCREASING NUMBER OF LGUS USING ETRACS





In a short span of time, the number of LGUs using the system have been growing steadily, as shown in Figure 1. One of the measures of success is that some LGUs are institutionalizing the use of E-TRACS, and some people became regular because of this project. This is important to ensure continuity of the business while the system is continuously being innovated. Through E-TRACS, we aim to modernize the Philippines one LGU at a time.

# SYSTEM ARCHITECTURE AND FEATURES

E-TRACS is designed as a multi-user system and encompasses several offices. The diagram below (Figure 2) shows an ideal local area network setup for a medium sized LGU. E-TRACS can also be connected in wide area network to enable connectivity outside the office like market, slaughter house or barangay collection.

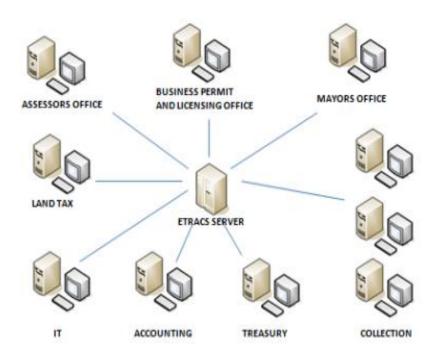


Fig 2. Ideal Local Area Network Configuration for E-TRACS





#### PROVINCE MUNICIPALITY SETUP

One of the objectives of ETRACS was to establish connectivity between the province and its municipalities. Through this connection, online transactions like field appraisal and assessment sheet (FAAS) approvals, queries and eventually online payment to allow a taxpayer to pay in the province with real time updating of their ledgers in the municipality, can be carried out. Because it is not feasible to have a centralized solution, E-TRACS uses a distributed architecture instead to send and receive data in near real time fashion using the cloud to channel data. The solution is quite similar to email, such that if there is no connectivity available, the data is queued temporarily and transferred the moment a connection is established. This solution requires however that both province and municipalities must have a optimum internet connection. For a province, this is cost efficient because they do not need to invest in expensive data centers or apply for leased lines. This setup is being tested today in the Provinces of Davao del Norte and Lanao del Norte.

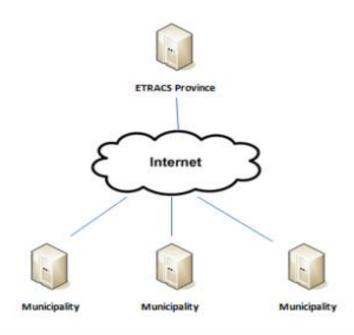


Fig 3. Optimum Province Municipality Setup for E-TRACS





## E-TRACS Modules

E-TRACS CONSISTS OF THREE MAJOR MODULES IN THE STANDARD PACKAGE, NAMELY.

- Treasury Module (Revenue Collection)
- Business Permit and Licensing (BPLS)
- Real Property Tax Assessment (RPTA)

## Treasury Module (Revenue Collection)

The collection module covers the complete cycle from assigning of accountable forms to collectors to remittance and liquidation up to deposits. Each revenue item is segregated by fund which is associated with the bank accounts. Unlike other solutions, the issuance of accountable forms is strictly enforced. *Printing of serial numbers is not manually encoded*. It follows the series of the accountable form issued. Collection is treated as a sensitive transaction and E-TRACS makes sure that each and every receipt is accounted for. Before a collector can collect in the system, there are several security steps that must be satisfied. First, concerned personnel must have sufficient role and permission. Second, an accountable form must be issued to the collector. Each accountable form is tracked in the accountable form inventory. E-TRACS also enforces that collectors must do a cash breakdown before remittance to their liquidating officers, and liquidating officers must check and balance remittances before deposit. The diagram below shows the complete process in E-TRACS collection cycle.



Fig 4. Collection Cycle for Revenue Collection, E-TRACS

Different types of collections can be plugged into the collection module. The miscellaneous collection is the default collection screen if there are no special plug-ins. The miscellaneous collection is a simple way of encoding accounts and their amounts. However, when there are plug-ins, it replaces the miscellaneous collection into a more appropriate screen. The collection screen *adapts* to the type of collection being processed within the same application. This illustrates the plug-in capability of the E-TRACS platform. This feature gives great flexibility to a collector because they will not shift to different applications when collecting different types of transactions. To illustrate, the following are screenshots for different types of collection, from a collector's perspective.





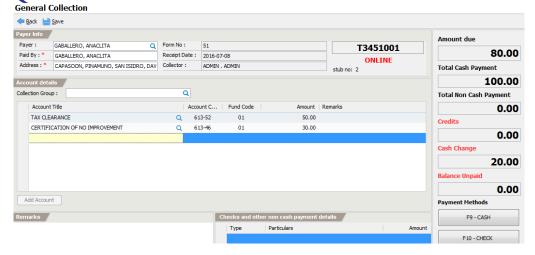


Fig 5. General Collection Screen, E-TRACS

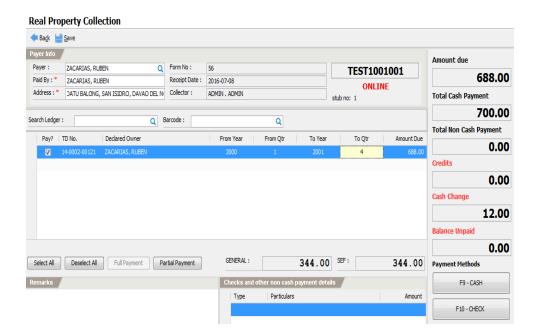


Fig 6. Real Property Collection Screen, E-TRACS

The following are the salient features included, but not limited to, in the Treasury (Revenue Collection):

- Manage and add fund accounts (General, SEF, Trust)
- Built in support for CRAAF (Consolidated Report on Accountability of Accountable Forms )
- Support serial and non-serial (like cash tickets) accountable forms





- Multi-layered security for bonded collectors
- Support for sub collectors (non-bonded collectors)
- Online and offline printing through controlled numbering of receipts
- Support for associating receipts with existing taxpayers or walk-in payers
- Efficient batch capture of receipts for field collectors
- Support for voiding collections
- Allow collection of any type of revenue per collector (Collect RPT or BPLS, etc)
- Support for cash and check payments. Mixed payments are allowed.
- Income accounts can be mapped and exported to NGAS and SRE accounts
- Daily remittance and automatic printing of collection reports
- Daily remittance report are segregated by account, account type or fund
- Support for deposits and reconciliation. Deposits are segregated by fund.
- Allow direct printing and customization of deposit slips.
- Support for cash tickets
- Payment Order (allow other departments to send order of payments)

## BUSINESS PERMIT AND LICENSING (BPLS)

One of the truly unique features of E-TRACS is the use of rule engines in the BPLS Module. Establishment of business taxes, permit fees and charges when applying for business is very difficult to automate considering the different practices of LGUs in imposing taxes and fees. What is applicable to one LGU may not apply to another. Most systems resort to reprogramming and customization for those areas not handled in their program design. This is not cost-efficient and most definitely very hard to maintain. What makes it difficult is that tax imposition is not straightforward that one can simply lookup tax tables or use formulas. It is highly unstructured and dependent on information provided by the business applicant. Some proposals were made to standardize fees so that LGUs will adapt to the system, not the other way around. However, this approach would be next to impossible considering that LGUs are autonomous and have their jurisdiction to maximize their revenues or lower taxes as they see fit. It is for this reason that TRACS had its limitation. Again, E-TRACS has made a huge improvement in this area by employing rule engines. A rule engine, an example of which is shown in Figure 7, is a special software that executes rules in a runtime environment. Rules are authored by the business expert, and during execution, data or facts are evaluated and the appropriate rules are fired to produce the outcome,





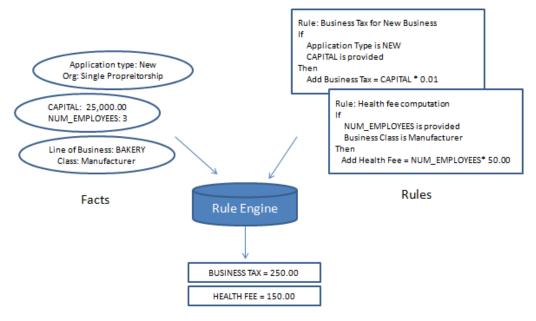


Fig 7. BPLS Rule Engine

The rule author translates ordinances into rules through a rule authoring interface as shown in Figure 8 below:

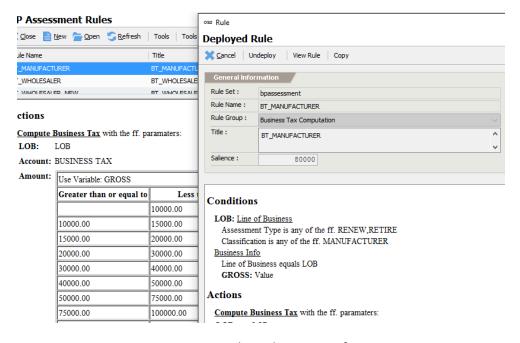


Fig 8. BPLS Rule Authoring Interface





With the use of the rule engine, E-TRACS was able to accurately capture ordinances in the LGUs. In fact, LGUs also realized that they could improve on their way of computation because the system helped them realize that they were under-collecting on some businesses due to improperly categorizing lines of business or segregating essential from non-essential sales which they missed out before because of the tediousness of such computations.

The following are the salient features included, but not limited to, in the BPLS Module:

- Support for unified form (Business Streamlining)
- Support for 4 step process application, one time assessment, one time payment, releasing
- Paperless transaction (online interview no need to fill up forms)
- Support for the following transactions: New, Renew, Retire
- Support special transactions like Add/remove lines of business, report quarterly gross for new business, reassessment, processing of late renewals
- Highly flexible rule engine that can be customized for any kind of computation of tax, fees, penalties, discounts and requirements based on the LGUs ordinances
- Smart application that asks only relevant information for a particular kind of business
- 100% fully automated assessments with 0 manual intervention
- Trace change history of business information: tradename, address, organization type, etc.
- Supports multiple lines of business and assess taxes and fees by line of business or by establishment
- Support for data capture of manual assessments for initial data build up
- Support for advance billing
- Seamless integration with treasury module for payments
- Accepts quarterly and partial payments
- View business ledgers and payment history
- Automatic segregation of applications that are due for renewal
- Controls the issuance of permits only to applications that have paid the minimum amount required
- Support for SMS inquiry
- Support of PIN for integration with GIS
- Mapping of revenue accounts to SRE (Statement of Revenue and Expense) to generate the required BLGF reports
- Reports Business Listing, Business Owner Master List, Application Listing, Business with permits listing, Business Comparative Assessment Listing, Business Comparative Listing, etc.
- Various reports that can be outputted to different file formats like PDF, Excel, CSV etc.

## REAL PROPERTY TAX ASSESSMENT (RPT)

The Real Property Tax module is the most complex component in the system due to the sheer number of transactions and the amount of data it captures. E-TRACS makes sure that errors are prevented during transactions and goes to greater lengths to achieve it. For example, when subdividing or consolidating lots, several RPUs (real property unit) that may require cancellation and re-numbering, will be affected. E-TRACS will process all these as





one transaction so that errors will be avoided. Most systems are not very particular with this. Unlike E-TRACS, in some systems each transaction is done manually so imagine a lot subdivided into a hundred lots and the chances of errors will be magnified. If an LGU is not very particular with accuracy of the data stored in their database, then this type of system is acceptable for them. However, in E-TRACS, less than 100% accuracy is not acceptable.

All assessments in E-TRACS are automatically computed based on the schedule specified. It includes assessments for land, building, machinery and plants and trees.

The following are the salient features included, but not limited, in the RPT Module:

- Fully configurable settings, schedule of market values and assessment options
- Automated computation of assessment
- Comprehensive FAAS data requirement
- Implement transactional workflow from appraisal, verification and approval.
- Protects data integrity by recognizing "interim" records from approved ones.
- Support for the following transactions: Simple Transfer, Transfer with Correction, Transfer with Reassessment, New Discovery, Change Classification, Change Taxability, Change Depreciation, Correction of Entry, Reassessment, Multiple Claim, General Revision, Subdivision, Consolidation, Cancellation of FAAS, Multiple Claim Settlement and Batch General Revision
- Transactions are fully automated avoiding "orphan" records such as processing of subdivision or consolidation automatically includes processing of affected properties like buildings or machineries.
- Support for FAAS annotation and cancellation.
- Automated issuance of Tax Declaration Certified True Copy
- Transmittal of FAAS records
- Issuance of certifications including: Land Holding, Land with Improvements, Land with No Improvements, Multiple Property, Latest and Existing Property, No Encumbrance Certification, Certificate of Ownership, No Property Certification and more.
- Batch Printing of FAAS
- Seamless integration with Land Tax
- Flexible and dynamic Rule-Based billing computation
- Support for Advance billings
- Support for partial payments
- Batch generation and printing of Realty Tax Bill
- Online generation of Realty Tax Clearance
- Support for Compromise Agreement
- Generation of the following reports: Approve FAAS Listing, Master List of Real Properties, Notice of Assessment, TMCR, Ownership Record Form, Journal of Assessment Transaction, Accomplishment Reports, Comparative Reports, PDAP-RPTA-100 Report, Report on Real Property Assessment, List of Annotated FAAS (sample shown in Figure 9) and more
- Generation of the following LandTax reports: Abstract of Real Property Collection, Barangay Share, Realty Tax Delinquency Listing, Compromised Payments, Top N Delinquent Taxpayers, Top N Realty Tax Payer





#### REAL PROPERTY FIELD APPRAISAL AND ASSESSMENT SHEET - LAND/OTHER IMPROVEMENTS ARP No.: 2014-06-0004-00001 PIN: 063-06-0004-001-01 Title No. : Lat No. : 2 Blk No. : 2 Survey No.: PSD-3 Owner: HALALON, FELIZA Tel No Address: PURO K-4, LIBUTO N, SAN ISI DRO, DAVAO DEL NORTE TIN : Tel No. Administrator / Beneficial User Address : TIN: PROPERTY LOCATION Brgy./District: IGANGON DAVAO DEL NORTE PROPERTY BOUNDARIES Land Sketch : 15 East: 14 11 14 12 West: 11 12 LAND APPRAISAL Sub-Classsification Unit Value Classification Base Market Value Area RESIDENTIAL - 1ST CLASS 231.00 m<sup>2</sup> 530.0 122,430.00 Total: 231.00 sqm 122,430.00 OTHER IMPROVEMENTS TOTAL NUMBER Unit Value Base Market Value TOTAL

Fig 9. Sample FAAS generated in E-TRACS

# **TECHNOLOGY**

E-TRACS is continually developed using Java 1.6 platform which runs basically in the majority of operating systems. E-TRACS can be used in Windows, Linux or Mac OS provided the correct java version is installed. Currently, there are two databases supported – MS SQL Server 2008 or higher and MySQL 5.0 or higher. The most important consideration is it provides choice in the implementation. The rationale for this is that most LGUs already have skills trainings and hardware investment in some of these technologies so it would be practical to use whatever technology they are already familiar with.





## **IMPLEMENTATION**

To make the most of E-TRACS, all modules should be implemented because it is a highly integrated and coordinated system. It would not be effective to implement partially like if only assessment is used without collection. For a successful E-TRACS implementation, it needs to have the right hardware in place and full cooperation from the people who will use it.

## HARDWARE REQUIREMENT

- 1 Server (for ETRACS server and database) server-grade at least 8 GB RAM and 100 GB disk space or more
- Local area network in place to connect the computers (e.g. LAN cables, routers)
- Computers at least 1 per each of the ff:
- Assessors Office (2 recommended)
- BPLO
- Land Tax
- Treasury
- Collector
- Mayors Office
- Accounting
- Printers (for receipt printing) Epson LQ300+ / Epson LQ590
- Printers (for Permits) deskjet or laser jet printer

#### **PEOPLE**

The following are the key roles and their tasks that must be involved when running ETRACS

Role	Task		
System Administrator	Manages the system and acts as the first level support		
Accountable Form Officer	Manages accountable forms and keeps track of form inventory		
Collector	Issues online, offline receipts. Performs collection		
Liquidating Officer	Checks and balances collector remittances		
Cashier	Performs deposit		
RPT Admin	Encodes schedule of market values and master files		
Assessor	Encodes FAAS, performs assessments and other RPT transactions		
Land Tax	Manages RPT ledgers		
BPL Admin	Manages business rules and ordinances		
BPL Assessor	Performs assessments and billings, manage business ledgers		
Accounting	Maps revenue accounts to NGAS accounts for automation of posting to their proper		
	accounts		
RPT Approver	Approves RPT Transactions		
BPLS Approver	Approves BPLS assessments		





## **TRAININGS**

There are three types of training being offered: end-users, system administrators and developers.

#### **USERS TRAINING**

End users are given an orientation about the system and on how to use the system. The training usually is 10 days - 5 days for BPLS and Treasury, and 5 days for RPT and Land Tax.

#### System Administrators

Special training are offered for administrators to equip them on how to manage the system and how to manage the database of their choice, how to troubleshoot the system and handling common errors.

#### **DEVELOPERS**

Developers are given an orientation on the whole E-TRACS ecosystem and architecture framework, how to use the data to generate reports, how to reuse and call the APIs, and how to extend and customize the system. Trainings for developers are classified based on their skill level - beginner, intermediate and advanced. If necessary, trainings for technologies used in the system will also be offered like java, groovy and SQL.

# **PRICING**

## IMPLEMENTATION ASSISTANCE SERVICES (ROLLOUT)

Although the LGU may opt to do this themselves, the E-TRACS system is a complex system to implement and might require the services of Rameses especially for LGUs who do not have capable IT personnel. For this purpose, Rameses offers a packaged service to assist in the rollout of the system:

Rollout Service ( 3 consultants ) for 10 days

Php450,000.00 (VAT Inclusive)





## MEMBERSHIP IN E-TRACS SUSTAINABILITY

The LGU is encouraged to subscribe to the annual membership to E-TRACS Sustainability to ensure that there will be assistance in case problems occur. Besides support there are several benefits in becoming a member

#### **Annual Membership Fee**

Php75,000.00 (VAT Inclusive)

Members Benefits:

- Free E-TRACS version updates and assistance in upgrading
- Support for bug fixing and troubleshooting problems (email, remote desktop)
- Training fee discounts
- Access to member's website (member's forums)
- Account in the cloud for transferring data from one LGU to another
- Free limited hosting of transactional systems using our CMS (content management system)
- Taxpayer's portal (in preparation for online transactions like billing and e-payment)
- Access to special cloud-based services like SMS
- Special software like Queuing System (does not include hardware)

#### TRAINING FEES

For trainings conducted in Cebu, specifically in the Rameses Training Facility, the following are the training fee rates:

Member LGU Php 1,500.00 per person per day

Non-Member LGU Php 3,500.00 per person per day

#### TRAINING FEES

For trainings outside Cebu, training fees will be based on the professional fee of the consultants. No. of participants must not exceed 30 heads.

Main Trainer Php 30,000.00 / day

Assistant Php 5,000.00 /day

<sup>\*</sup> Training Fee includes two snacks and lunch for the participant. Fees do not include accommodation, travel, etc.





\* Training Fees do not include meals, snacks during training. It also does not include travel, accommodation and meals of the consultants.

#### ON SITE SUPPORT

Should the LGU require an onsite support of the consultants, fee will be based on the daily professional fee:

Professional Fee (On site support)

Php 30,000.00 / day

\* This does not include travel, accommodation and meals of the consultants.

## **PLUGINS**

Plugins are special applications not included in the standard package of E-TRACS and should be purchased separately. Plugins are paid for only once. Version upgrades, if any, will be given for free. The following are the plugins currently available, or are requested for development with corresponding prices.

Name	Brief Description	Price (Php)
Community Tax Certificate (CTC)	Automatically computes charges for CTC and	60,000.00
	updates taxpayers records. Handles both	
	individual and corporate community taxes	
Market Rental Module	Track rental units in the market and provides	125,000.00
	billing and tracks rental payments	
Vehicle Registration System	Manages different registration of vehicle types	85,000.00
(including MTOP)	including but not limited to tricycles, boats etc.	
	and tracks renewals or retirement	
Ordinance Violation System	Encodes traffic and other violations and computes	60,000.00
	fees based on the number of offences	
Waterworks System	Tracks account of subscribers, encodes reading	375,000.00
	consumption, billing and track payments. Fees can	
	be configured via rules	
Skills Database Registry	Extends the entity (taxpayer) records to include	100,000.00
	skills, work experiences and other info to be used	
	in a job skills matching facility	
Building Permit system	Handles applications, assessments, payment and	420,000.00
	releasing of building permits. Records stored	
	include pictures and sketches and workflow facility	
	allows taxpayers to monitor progress of the permit	

All Prices are VAT inclusive and are subject to change





For more information, visit www.etracs.org

#### **Contact Information**

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