

TAPR IQC Egypt
Technical Assistance to Support Economic Policy Reform

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Task Order 1: Delivery of TAPR Core Management Team

**Assessment Report:
Oracle Database and Computer Network**



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ASSESSMENT REPORT

ORACLE DATABASE AND COMPUTER NETWORK

DEPARTMENT OF ECONOMIC RESEARCH (DER)

CENTRAL BANK OF EGYPT (CBE)

Prepared by

TAPR

For

USAID/Sector Policy

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Preface

A TAPR technical team prepared the following assessment report. The overall objective of the task was to assess the status of the Department of Economic Research's (DER) Oracle database and computer network system. Specific objectives were to:

- Determine what aspects of the database software installation are not complete.
- Determine what elements of the software development are incomplete or contain errors.
- Assess training needs.

The assessment outlines the present status of DER's computer network and database capabilities and offers recommendations for improvement to the DER's database programs, applications, equipment, computers and network infrastructure.

Background

During 1997 and 1998, assistance provided to the Department of Economic Research (DER) of the Central Bank centered on the establishment of an Oracle computer database, econometric training, and the development of an econometric model of the Egyptian economy. The DER has concluded that the database is not fully functional and the associated software has not been fully completed or installed. TAPR was requested by USAID to assess the situation and make recommendations based upon the assessment findings.

Overview of the Central Bank of Egypt, Department of Economic Research

The Central Bank of Egypt's Department of Economic Research (DER) is made up of four divisions. The four divisions are outlined below, followed by an overview of the computer network in the DER.

(I) Foreign Transactions Division

Which is comprised of the following subdivisions:

1. International Economy Division

The responsibilities of this subdivision is to operate the following processes:

- Foreign resources.
- Foreign resources transfer.

- Foreign Direct Investment in Egypt.
- Recently held foreign financing agreements and the net flow of foreign funding.
- The distribution of the foreign funding.
- Foreign debts.

2. Foreign Trade

The main concerns of this subdivision is to focus on the following processes:

- Exports.
- Imports.
- Geographical distribution of both imports and exports.
- Exports based on the various economical consortiums.
- Exports based on the method of payment and the exported products.
- Imports based on the method of payment and the imported products.

This division is comprised of eight employees.

3. Credit Balance.

This subdivision is focused on the assessment of data related to the credit balance.

The International Economy Division has eight employees.

(II) Domestic Economy Division

This division is concerned with the following:

- Local production and the cost of production requirements.
- Financing of local production.
- Applied investments.
- The coverage percentage of the most important local products to the consumption of the agricultural and industrial products.
- Population, work potentials, and unemployment.
- Number of tourists based on country of origin.

- Number of nights tourist stayed in Egypt based on country of origin.
- End-user record numbers.
- Dealers record numbers.
- Outcomes of the overall Egyptian economy balance.
- Incomes of the overall Egyptian economy balance.
- Economical unbalance and financing options.
- Prices of treasury incomes and outcomes.

Four employees are currently assigned to this division.

(III) Money and Banking Division

This division is specialized in the following:

- Money supply.
- Reserve money and counterpart.
- Domestic liquidity and counterpart assets.
- Local currency deposits.
- Foreign currency deposits.
- Foreign assets and liabilities.
- Domestic credit.

Eight employees are currently assigned to this division.

(IV) External Economy Division

This division is focused on the following:

- Foreign currency price data.
- Foreign currency interest data.
- Foreign currency exchange data.
- Arab currency to foreign currency exchange prices.

- Economic development data.

Currently four employees are assigned to this division.

Computers, peripherals, network, and programs in DER

The following is a description of the computer systems in use at DER.

- **File Server Digital.**

Pentium PRO 200.
4 G.B. H.D.D.
64 MB RAM.
MS-Windows NT Server. Version.4.0.
Oracle Express Server. Version.6.1.

- **20 PCs**

IBM Personal Computer 300 GL
Pentium 166 MHz
2.6 G.B. H.D.D.
16 MB RAM
MS-Windows 95

- **10 PCs**

IBM Personal Computer 300 GL
Pentium 166 MHz
2.6 G.B. H.D.D.
32 MB RAM
MS-Windows 95

- **One PC Digital**

Pentium 166 MHz
1.6 G.B. H.D.D.
16 MB RAM
MS-Windows 95
Oracle Express Analyzer Version.2.0.5.1. One license.
Oracle Express Objects Version.2.0.5.1. One license.
Oracle Express Relational Access Manager Version.2.0.0.1. One license.
Personal Express. Version.5.0.3.

Method of Work

TAPR fielded three specialists; a systems analyst, software designer, and a computer programmer. All members of the team have trained and worked with Oracle systems and the firm they work with is an Oracle partner.

An introductory meeting was held at the Central Bank between TAPR's technical team and DER management representatives. The meeting discussed and defined the time required for the team to complete its assessment and to submit the final assessment report to USAID. The meeting also sought to clarify conflicting understandings of work done by a contractor contracted in 1997 to install DER's Oracle database system. A copy of the contract was requested but never received. The documents are presumed lost.

Based on the fact that the assessment team could not find any documentation that would outline previous plans for the installation of the existing database the team proceeded with an assessment of the DER database through site visits, computer system examinations, and meetings with DER management and staff.

The team visited the DER economic research department a number of times over a two-month period. During that period the team:

- Met with managers of the Information Systems Division of the DER. Together the team and managers reviewed the existing computer systems' hardware, network, implemented applications, licensing, and the economic research database already on the main file server. Of particular concern was the unavailability of licenses for most of the programs used. Licenses for the following programs are presumed lost.
 - Oracle Personal Express Ver.5.0.3
 - Oracle E
 - Express Relational Access Manager Ver.2.0.0.1.
 - Oracle Express Object Ver.2.0.5.1.
 - Windows NT Server Ver. 4.0.
 - MS-Excel.
 - E-Views
- An inspection visit of the existing network infrastructure with Information Systems Division staff found that the supplied network software and hardware infrastructure is per international standards. However, the installation was not complete or accurately done. Neither the Oracle engine nor interface is usable. Serious concern was raised with regard to the very limited file server processing power, memory capacity, and main

storage capacity. The assessment team also found that there is no clear contingency plan in place for emergency situations.

- Extensive discussions were held with the managers of each division of the DER. Discussions centered on reviewing and assessing the implemented automation for each division's database. Discussions and review of the system clarified what databases have been installed and whether the required automation functionality is in place. Also assessed were the means used to input data, types of reports and data required by the DER, computers, peripherals, and network performance.
- Additional meetings with DER staff further clarified problems with the present system. This included the problems divisions have with inputting data, editing data, and producing reports and statistics, and difficulties with using the existing computer system.
- The team also assessed staff capabilities based on level of training received. Some staff has been trained since 1998 in MS-windows 95. No training has been done for MS-Excel. A two-week training orientation - not an Oracle training program- was given to four DER staff on Oracle database; no instruction was given to the remaining staff.
- In sum, the team assessed the necessary requirements for each division within DER to be fully automated and thus maximize performance and productivity of the department.

Findings of the Technical Assessment Team

Based on the assessment carried out, the technical team found the present system incomplete and with a number of weaknesses. Because of this only ten percent of the Oracle system's potential is used at this time. This has crippled DER's ability to use the Oracle database system to its full originally intended potential. Below is a description of weaknesses found in the present system.

1. Only two databases were installed with Oracle, one in the Domestic Economy Division and the other in the International Economy Division. Each of these divisions has its' own database. No link or relation was established between the databases or with other Central Bank databases. Data transfer is done manually using paper forms.
2. The other divisions, Money and Banking and Foreign Transactions have no Oracle database of their own. These departments use spreadsheets for reporting, research, and statistics.
3. All divisions prepare initial data using MS-Excel spread sheets rather than Oracle. Multiple steps are required to input data.

4. Only the Foreign Transactions Division receives initial data from the Central Bank's main information system using a digital format.
5. All data exchange between divisions is processed manually using paper forms.
6. All input data for all divisions is entered using MS-Excel spread sheets.
7. All outputs consist of standard form reports and variable form reports.
8. Reports have been produced for both Local Economy and Foreign Economy divisions, but these reports are not without problems.

A graphical presentation of existing system effectiveness and staff training is provided in Annex A.

Recommendations

Based on the overview of the DER and its separate departments presented at the beginning of this assessment and the weaknesses in the system cited above, the technical team recommends that the following be done to make the DER a fully automated department as was originally intended.

- Link divisions together in one computerized data system.
- Eliminate all operational duplications in the various divisions.
- Link the DER and subdivisions through the computerized data base system with other related entities.
- Provide a subsystem for each division to enable each division to operate to the optimum as a part of an overall system.
- Enable the system to promptly produce requested reports.
- The capacity to address future objectives that may be desired by the DER management responsible for economic research operations.

Required development areas are:

- Upgrade all operating systems, databases, and development tools to the latest versions. Programs suite developed for economic applications.
- Redesign and implement an overall information system to provide decision-makers with all the required information, data, charts about the various activities of all the divisions that comprise the DER.

- Applications development methodology according to the staging outlined and the prioritization of the Central Bank management.
- Training divisions' staff to use and develop the implemented information system, database, and the operating environment.
- The migration of the currently utilized data and information to the final form of the database that would be utilized and developed.

Applications to be developed

1. Programs suite

Includes the following operational applications:

- Foreign transactions
 - Foreign trade
 - Foreign financing
 - Outgoing balance.
2. Domestic Economy Division.
 3. Money and Banking Division.
 4. Foreign Economy Division.

Outline of Proposed Automation Plan for the DER

- Apply international standards specified for communications equipment as an essential base in the design of the overall communication network linking all divisions of the DER.
- Build a powerful database designed along international standards.
- Apply an automation plan according to the priorities identified by Central Bank top management.
- Develop economic applications suite based on international standards and in accordance to the Central Bank's system and requirements.
- Maximize use of the relational database systems (RDBMS) concepts, and application development tools. This application offers great potential in building database applications that allow for relational applications and can manipulate large databases. Relational databases allow for optimum flexibility and functionality in the daily processes of data input, searching capabilities, and

reports development that would enable DER to tailor make reports to fulfill different requirements.

- Provide technical assistance required to migrate the existing bank database to the operating systems environment planned for within the outlined development path options proposed.
- Design the divisions' applications with regard to the specified functions of each application, in addition to the function implied by the detailed analytical study that will be performed for each application.
- Focus on a tailored application as the optimum method for the implementation and development of the required applications in accordance with current and future bank operation requirements. Technical assistance and maintenance for such applications and for implementing application upgrading that may be required in the future.

Technical Team's Suggested Options for Upgrading DER System

The following is an outline of each of the three options proposed by the TAPR technical team. As part of the assessment team's findings all options include the following general recommendations.

Solutions proposed for the DER automation project include:

- An automation project done in close coordination with a bank team throughout the project.
- Build required infrastructure that links all division together.
- Prepare an analytical study for the DER.
- Design economic applications for each division.
- Test all applications.
- Commission and deliver developed applications based on priority.
- Train employees and support staff to use applications.
- Deliver documentation of delivered applications.
- Test the DER applications integration as one system.
- The CBE should approve all components of the applications suite.
- Continue to provide customer support free for not less than ninety days after final delivery.

- Continue to provide customer support after the proposed warranty expires. This is based on a separate support contact.

Option 1: Excel Server Solution

This solution is based on DER's existing software applications and bases itself on the Excel Server Package. No Oracle systems would be used. The Excel package will serve as the backbone database with a SQL database management system, and MS Excel for each user. This option would cost approximately \$605,000 and take 6-9 months for complete installation.

Advantages to this solution:

- Ease of use and required training is minimal.
- Low cost solution for installation, training, and software licenses.
- Short period required for installation.

Disadvantages to this solution:

- This solution does not achieve CBE's request for Dynamic Reports. This will hamper production of economic functions reports which is one of CBE's specific requests.
- Poor level of security
- Not stable enough to support CBE's very large database.
- Not portable or scalable
- Not easy to integrate DER database with future upgrades to CBE's overall Oracle database.

Option 2: Database Management Solution

This solution would use Oracle's Designer, Developer and Discover programs for Dynamic Reports to upgrade DER's system. Installation period would run 12 - 15 months and the cost is approximately \$1,475,000. This is a simpler Oracle system than the one originally and only partially installed. None of the original Oracle system would be used. Use of the existing Oracle system is an element of Option 3.

Advantages to this Solution:

- Supports one-time data entry and has a user-friendly data entry interface menu.

- Supports all RDBMS features.
- Enables CBE to migrate and develop future needs and edits with no additional cost.
- Applications are tailored to CBE's specific needs.
- High level of security.
- Remote access and remote sites replication available.
- Supports unlimited number of database records, including future expansion.
- Scalable, portable, and connectable with existing databases or operating systems.
- Ease of future upgrades and is adequate for staff needs for at least the next ten years. Future upgrades and edits depend on the CBE staff. Also easy to upgrade for web applications.
- Full Arabic support system

Disadvantages to this solution:

- High cost solution.
- High cost training solution
- Lengthy installation period compared to the other options..

Option 3: Oracle Financial Analyzer Solution

This solution uses the existing Oracle Express Server, an upgrade for Arabic needs, an Oracle Financial Analyzer and Oracle Sales Analyzer. The existing Oracle system would have to be re-licensed. This solution requires 5-8 months for installation at a cost of approximately \$2,050,000.

Advantages to this solution:

- Top-notch Oracle system
- A ready-made application but can be tailored to address specific needs.
- Ease of upgrades and edits.
- Short installation period.
- High level of security

- Remote access and remote sits application available.
- System supports an unlimited number of database records.
- Reliable, scalable, portable, and connectable with any existing database or operating system.
- Supports Arabic though not unlimited.

Disadvantages to this solution:

- High cost solution.
- Not flexible in generating menu designs.
- Future upgrades costly.
- Requires technical support services from supplier
- Not flexible for future web required format.
- High cost training solution.

The table on the following page breaks down, by cost, each component of the three options presented. The costs are estimations (+/-20%) and subject to change based on Oracle pricing policy, new releases and new features.

Three Options Proposed by Assessment Team

	Option 1: Excel Server	Option 2: Database Management	Option 3: Oracle Financial Analyzer
<u>Components</u>	<u>Cost in US Dollars</u>		
Hardware Upgrade	50,000	100,000	100,000
Network Development	10,000	10,000	10,000
*Operating and Database Software	80,000	270,000	790,000
Application and Data Migration	440,000	950,000	950,000
Staff Training	25,0000	145,0000	250,000
Total Cost	605,000	1,475,000	2,100,000
Implementation Period	6-9 months	12-15 months	5-8 months

* Approximately 80% of this cost under Option 2 would be used to buy Oracle applications and licenses for new software. A smaller portion under Option 3 would be used for re-licensing of Oracle equipment installed, but for which licenses are not available.

Annex A

Graphical Presentations of Existing System's Effectiveness and Level of Staff Training