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**Credit Bureau Business Models:
Success Factors and Technological Issues**

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I. Background

The Egypt Financial Services project is funded by USAID to provide assistance in promoting reforms that will enable the financial sector to develop. The project has four components: mortgage finance, registration, introduction of new financial instruments and establishing credit information systems.

In Egypt, credit information is currently available only on bank borrowers with borrowings of L.E 30,000 or more through a public registry maintained at the Central Bank of Egypt.

In June 2005, the Egyptian Parliament approved amendments to the banking law to enable the exchange of information between the Central Bank, Egyptian banks, mortgage finance companies, leasing companies and credit bureaus.

This amendment grants the Central Bank of Egypt the authority to license and regulate a private sector credit bureau(s). The Central Bank is also expected to oversee consumer protection rights.

Egyptian banks are presently founding a company to serve as an Egyptian Credit Bureau. It is expected that the credit bureau will collect information on individuals and perhaps, legal entities with less than L.E 30,000 borrowings, which presently do not appear in the public registry at the Central Bank. The kind of information to be collected will be related to consumer and mortgage loans, credit cards and other loans.

II. Objective

This consultancy addresses two Egypt Financial Services Key Results Areas (KRAs) KRA 4.1: Strengthen the capacity of Central Bank of Egypt (CBE) for oversight of private information systems and protection of consumer rights, and KRA 4.2: Private sector credit bureau (s) operational.

A. General Tasks

During the assignment the consultant discussed a number of issues relevant to the successful operation of a private sector credit bureau and presented to/explored with the Central Bank of Egypt (CBE) different options crucial for making the private sector credit bureau successful, as well as strengthening the capacity of the CBE to license, regulate and decide on the best credit bureau model for Egypt.

B. Specific Tasks

1. Present the advantages and disadvantages of different options open to a newly established private sector credit bureau. This includes hardware/software procurement/development, subcontracting to an international credit bureau company, time frame for development and operation, suggestions with respect to the management of the private sector credit bureau, possible management agreement between the private sector credit bureau and an international credit bureau company, and ways to ensure best management, as well as an independent neutral management if the credit bureau is owned by banks.
2. Discuss the most appropriate model for Egypt with respect to licensing one private sector credit bureau or licensing more than one, and the expected outcome of each option based on the consultant's international experience and the possible relation between several private sector credit bureaus with respect to exchange of raw data, competition, market shares, etc
3. The relation between the public registry and the private sector credit bureau. This includes the type of data available within each, the complementary relationship between the public registry and the private sector credit bureau, their abilities to serve the market and CBE supervision requirements. Examine issues related to the Central Bank of Egypt providing its own database, the advantages and disadvantages of this approach and whether the data base should be provided for free or sold to the first licensed private sector credit bureau. The CBE position if a second credit bureau is licensed and whether the data should be provided to a second credit bureau and the type of written agreement the Central Bank should have with the private sector credit bureau.
4. Ideal information that should be sent by all information providers to the private sector credit bureau.
5. Issues pertaining to the National Identity in Egypt and how such information can be useful in detecting fraud.
6. Important clauses in contracts between the private sector credit bureau and information providers and users. And, if possible, provide samples of standard contracts.

III. Description of Activities with the Central Bank of Egypt

In several meetings with CBE officials the consultant discussed possible approaches and options for the establishment of a private credit bureau in Egypt in order to encourage that sound principles are correctly followed early on in the process of establishing a Credit Bureau in Egypt. During our meetings the following topics were discussed:

A. Credit Bureaus: A Definition - according to the best international practices

A credit bureau is a sophisticated computer system (hardware and software) designed for sharing information that includes:

- 1- General Data (age, gender, social status, picture, addresses, phones, etc.)
- 2- Debt and Repayment Record
- 3- Judicial and Criminal Record

... Allowing current and potential lenders to make informed credit decisions consequently reducing the credit risk associated to a financial transaction.

The greater the amount of information available from and to a credit bureau (i.e. the more lenders contributing information, the number of years of information, etc.), the more useful the bureau will be.

In the Latin American experience, especially the Peruvian, Ecuadorian and Bolivian cases, the reality of a large percentage of the population without access to credit is still impressive. In Bolivia, access to financial markets is still perceived as a privilege reserved for the wealthiest and more economically established. Access to larger and extended consumer credit, especially products such as small loans, small credit cards, debit cards, etc. is not yet viable. From the information obtained from banks and other market players within Egypt's financial system we believe that this reality is basically the same in Egypt. According to the World Economic Forum's "Global Competitive Report" the lack of access to credit is by far the number one obstacle facing businesses in Egypt.

One of the main reasons for this, is the lack of credit information on potential borrowers. It is amazing that some governments, congresses or parliaments, financial supervisory institutions and even commercial banks have yet to fully understand the value of promoting, supporting and protecting the development of private credit bureaus, especially if the bureau is open to all enterprises that do business on a credit basis and require credit information on any potential client.

As a direct consequence of this situation, the less wealthy of a nation are still far removed from access to credit and thus, the possibility of improving their level of income or standard of living.

This must be reversed. Low and middle income segments are an extremely positive potential market for private credit bureaus and are vital groups concerning a nation's economic development. There cannot be economic growth in any given nation without the expansion of the micro-, small- and medium-size entrepreneur.

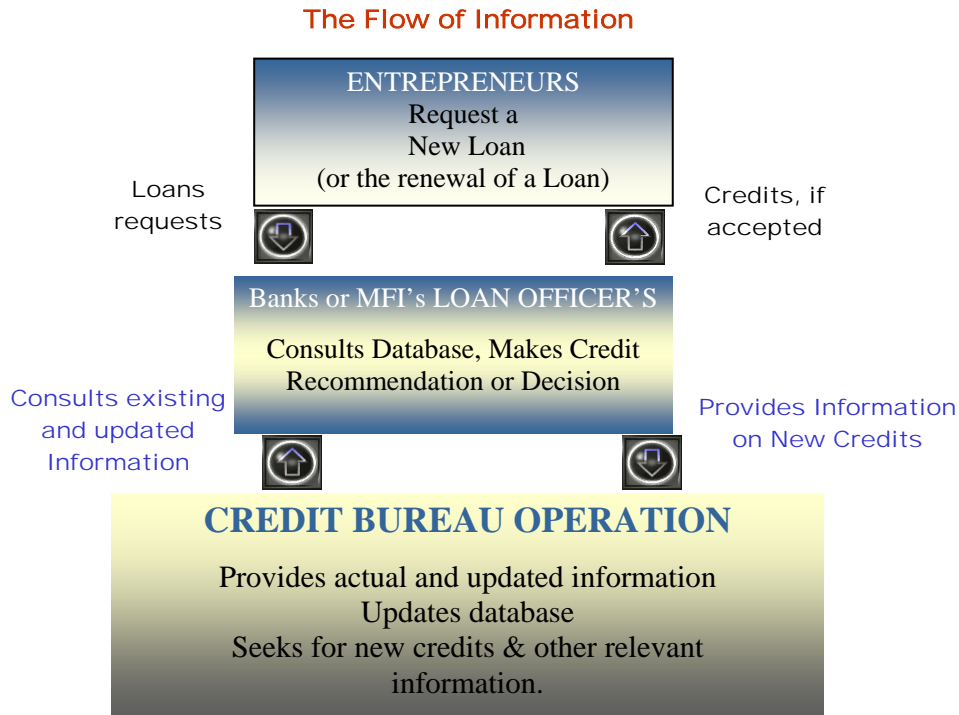
B. Who are the beneficiaries of a Private Credit Bureau?

- The nation itself (*The Re-Payment Culture is absolutely developed*)
- Commercial banks and financial institutions
- Small and medium enterprises
- The potential development of entrepreneurs across the nation

1. Several perspectives worthy of consideration when considering a credit bureau(s)

- a) Enables commercial banks and microfinance institutions (MFIs) to manage a sound portfolio and diminish credit risk.
- b) Monitors client debt loads to ensure they are not over-stretching their repayment capacity.
- c) Improves the long-term financial sustainability of banks and MFI's and thus their ability to alleviate poverty in the long term.
- d) Enhances coordination and sharing of loan portfolio information among banks and MFI's.
- e) Improves the financial performance of banks and MFI's (diminished "default risks") allowing them to provide financial services to a greater segment of the less wealthy.
- f) Reduces the problem of excess of debt (or the over-saturation of credits) of their clients.
- g) Encourages entrepreneurs to "grow and expand" as a result of the design and implementation of more reliable projects and investments.

C. How Does a Credit Bureau Work?



In our meetings with CBE we stressed the importance of the credit bureau providing the most comprehensive and complete credit report for clients and users from the initial stage of operations. In this sense, we firmly recommended that the most sound and state-of-the-art technology for accomplishing this goal must be re-enforced to ensure success at the initial stage of the credit bureau's establishment. This will be explained in greater later in this report.

D. Ideal Content of a Credit Report

- Digital picture
- Biographical data
- Telephones and addresses
- Credit information both positive and negative
- Floor limits on loan amounts.
- Maturity
- Debt current balances (30,60,90,120,150,180 days)
- Corporative information

- Motor vehicle information
- Insurance data and claims
- All judicial information available.
- Repayment records for at least three to five years.
- Risk factors variables associated to a consumer based upon repayment record
- Monthly monitoring of accounts or early warning systems
- Graphs and charts related to a person's debt, balances and repayment record.
- Credit scoring services based on statistical and mathematical analysis

E. Credit Bureaus: A Great Path to Strengthening the Financial System

In our discussions with CBE officials we established the importance of credit bureaus as tools for strengthening the financial system. The following topics were discussed in some length and detail:

1. Credit Bureaus promote the transparency of credit operations within the financial system. It will also function as a collateral protection tool for savings deposits and current accounts within the financial system (reducing risks of banks defaults).
2. Credit Bureaus as a powerful tool in the implementation of the **Basel Agreements I and II** regarding the "Know Your Clients" policies.
3. Credit Bureaus as a time and cost reducing tool for the approval of new credits, as well as the renewal of existing credit.
4. Credit Bureaus as the most reliable tool for credit assessment of a credit subject within the financial institution.
5. Credit Bureaus as an excellent mechanism for recovering loans in moratoria portfolios.
6. Credit Bureaus as a strong fraud prevention tool.
7. Credit Bureaus as a very efficient anti-delinquency tool, especially for commercial banks.
8. Credit Bureaus as an additional tool or mechanism for the employment of personnel within banks and business enterprises.
9. Credit Bureaus as an additional tool for money laundering prevention.

F. Options for Establishing a new Credit Bureau in Egypt. Resources needed for its initial installation, development and operation.

The Business Model

Option 1: Bring in privately-owned credit bureaus affiliated or belonging to a larger worldwide organization. (High Market Share and Low Initial Investment)

The main goal of this first option is to attract to Egypt international credit bureaus (foreign investors) already participating in this business and market segment in the United States, as well as in Latin America, Asia or Africa.

In order to achieve this goal, the CBE should permit this option to be feasible and become an active participant in the process. It is of vital importance to carry out a sound market analysis regarding present and potential business (five to ten years) concerning credit development such as credit cards, personal loans, and commercial businesses operating on a credit-basis and other related enterprises, both in the regulated and non-regulated banking sector. This market analysis should project the business expected in the near future by the above-mentioned players to show the short and medium term profitability to future investors.

It is preferred that the results of this market analysis be presented by CBE officials, alongside a country micro-macroeconomic data portfolio, to potential investors, owners and executives of several reputable credit bureaus around the world. This will allow these potential investors to acquire a suitable and sound picture of investing in Egypt, as well as the ability to assess the Government of Egypt's endorsement of this initiative.

Advantages of this Option

- **The proper business “Know How” and the ability to initiate it in the short term.**

Start up/installation costs are significantly less than the development of a local credit bureau since an established credit bureau operation has at hand the operational and software technologies, minimum hardware requirements and assembling, knowledge of necessary communication platforms, as well as the appropriate management in terms of daily operations.

The period for establishing a credit bureau with the above mentioned characteristics after the proper “operating license”, as well as receiving the country financial system primary data from CBE should not exceed six to eight months. It is highly possible that within this operative mode, data is collected in country, but processed in a certain trans-boundary processing center, particularly in the first stages of operation.

Another great advantage of this option is the transparency of the credit bureau's daily operations. This is because the management is not directed, influenced, or otherwise respond to the interest of any local financial group.

Disadvantages of this Option

Basically none. Opposing arguments could be high service fees, an elitist approach to the business (e.g. banks only), data manipulation by a foreign firm or data processing out of the country, if this were the case.

Usually management is composed of experienced global executives with sound knowledge of the business teamed with local managers who understand the local market and culture of the country where the credit bureau operates.

This model has rendered very good results in countries such as South Africa, Ecuador and Mexico among others. In some cases, firms offered shareholder participation to local investors.

Option 2: Establishment of Private Credit Bureaus - Locally Owned.

The credit bureau is established within the local context by investors without any affiliation to an international credit bureau firm. The idea is to develop a credit bureau "from scratch", assembling locally ("in-house") all its operating technology (hardware and software).

Advantages of this Option

Basically none when compared to the previous option, except for being a local firm developed by local investors.

Disadvantages of this Option

- **It requires a great investment in terms of financial and human resources.**

In the credit bureau industry there are no hardware, and even less software available in the market which could be labeled "standard" (*off the shelf*) for administration and operational purposes. With this option everything must be "custom made", according to the specific requirements of the particular credit bureau. This requires integrating a strong team of systems engineers and software developer specialists. Such specialist will add significantly to start up costs and these specialists are often unfamiliar with the complexities of credit bureau hardware/software needs.

- **The process of developing a Credit Bureau whose operations and final credit reports to its affiliates comply with the best international practice is also time and resource consuming .**

Over the last ten years the credit information industry has been characterized by major growth and standardization of procedures and operations.

The process of developing the technological infrastructure, especially in the field of operational software could be long, tedious, expensive and very time consuming for any local credit bureau that intends to begin from “scratch”.

Experience tells us that many credit bureaus have failed because of the inability to fully appreciate what we have previously stated here. Consequently, early operating systems were inadequate, lacked speed and sufficient processing capacity, were unable to handle and standardize their affiliates’ data, final reports for users did not correspond to best international practices, and service to the client ended with disastrous results.

It is widely known within the credit bureau industry that this business is one of the most intricate and difficult to manage and sustain with excellence in both service and operational capacity.

- **The danger of a lack of credit bureau credibility and dependability.**

As a rule of thumb, credit bureau owners should not be part of the financial system, particularly banks or financial institutions, as either sole owners or shareholders. The experiences of several countries with this have not yielded good practical results.

The credit bureau is a business based on **trust**. This **trust** implies the absence of unfair competition among banks or financial institutions owning the bureau and those which are not part of the owners group and that data is not used in detrimental actions against the interests of other affiliates.

Experience has demonstrated that when the credit bureau’s ownership is in the hands of some banks, financial institutions or financial groups recognized in a country, other potential affiliates retract themselves from participation because of the generated distrust. In addition, when banks and financial institutions are the holders there is a trend (shown by empirical analysis and case studies) to deny full participation to other important players. This leads to credit bureaus with monopolistic features which is unhealthy for the whole financial and commercial system.

Option 3: Local credit bureau affiliated with an international credit bureau

The credit bureau is established within the local context and by local investors, but affiliated with/or delegating management under contract to an international credit bureau firm.

Advantages of this Option

- **It is a bureau developed with local capital and by local owners, which is vital for the sound image of the credit bureau in the country.**

It is a sign of trust by local investors in the development of the country, in the development of the financial system, as well as in the government’s willingness and support.

- **The whole process of the new credit bureau formation, design, implementation and execution is much faster and effective, as well as less financial and human resource consuming.**
- **The credit bureau will operate according to the best international practice standards.**

Any globally recognized credit bureau firm in charge of general management will be guided by standardized processes thoroughly tested and with proven in other countries

- **From the start (and separately from its owners) the credit bureau will project an image of trust concerning the handling and administration of the data being processed.**

Our formal recommendation is that the credit bureau management should serve the banking sector and the whole market as a neutral market institution, despite of and separate from its ownership/management structure. This is essential to build trust in credit bureau operations and particularly for banks, which are not owners, to trust and participate in the credit bureau.

- **The management of the credit bureau by a global credit information service firm will ensure that operations are based on the most advanced state-of-the-art technology found in the market, which ensures better service to its users.**

The Importance of Full Financial and Commercial Integration: An open credit bureau

Regardless of the business model that Egypt opts to follow, it is of vital importance that from the start of operations, the credit bureau should be an “open” credit bureau. This means that the credit bureau should be established in such a manner that allows for the free flow and dissemination of financial information, from all market sources including, not only the banking sector but also the financial/commercial sector as a whole, whether regulated or non-regulated. It is internationally recognized that both the banking and financial sectors, as well as the commercial system, benefit from an open credit bureau and leads to a nationwide increase in consumer credit that is financially balanced and with a lower “default” risk.

A Case for the Microfinance Sector

A detailed discussion of the impact of microfinance on nation’s economic development is not within the scope of this report; however there is consensus that credit bureaus are extremely important for the development of this sector.

In addition, credit bureaus have proven themselves to be essential for microfinance in countries where they are already considered as an advanced tool for financial development. But, don’t be mistaken, they are not regarded as a specialized and independent credit information system but as a fundamental part and fully integrated with the national credit bureaus widely open to all the financial system.

The microfinance sector clientele in Egypt exceeds 400,000 borrowers. To leave this segment out of a credit bureau is absolutely senseless.

G. Complicated Issues discussed with Central Bank of Egypt officials.

The following issues were discussed in length with Central Bank of Egypt officials, especially with CBE Sub Governor Mahmoud Abd El Aziz.

1- Banks and MFI'S Willingness to Share Information

Reactions to the information to be included as: Positive/Negative Data, Floor Amounts, Length of Credit Record, Status of the Account, Phones, Address, etc.

At the earliest stages of any credit bureau project, banks and others financial and non-financial institutions have some “reticence” in supplying all the information required. They are afraid of “losing” some good clients if their information is widely spread among other financial institution, or if the name of any given financial institution providing the information could be displayed on the credit report.

Practical cases analysis, results and comparisons from other countries show no relationship in the aforementioned issues. Retaining a client is not a matter of dissemination of information but of competitive transaction costs, new products, as well as excellent client services.

The following are two different approaches to this issue, implemented by credit bureaus in Latin America, in which the author of this report was involved. These models were presented to Central Bank of Egypt officials.

a- The Ecuador Model. In the Ecuador Model, all financial data is supplied *on a monthly basis* from the banks' superintendent (*Ecuador's financial regulator, similar to the Central Bank of Egypt*) directly to the credit bureaus. Credit bureaus are responsible for obtaining the complementary information from non-regulated financial institutions and commercial enterprises.

b- The Dominican Republic Model. In the Dominican Republic Model, all financial data is supplied *on a monthly basis* from banks, financial institutions, commercial enterprises, telephone and mobile companies, etc, directly to the credit bureaus.

- In both cases a contract or agreement for services should be signed between the Central Bank of Egypt and the credit bureau and another between the end-users of the services and the credit bureau.
- Contracts of this nature protect the Central Bank of Egypt against any form of liability from the customer, protects and defines the relationship between an end-user and the credit bureau, protects the credit bureau from unnecessary liabilities and legal demands, and protects the consumer's rights.

2- Issues related to client identification.

Because many Egyptians may not have national ID cards (new or old), names may not be unique, precise birth dates are unknown, we strongly suggest that the credit bureau be provided with the National Registry of ID's directly from the government.

We are conscious that this suggestion may provoke some negative reactions from government authorities, but it is absolutely necessary to provide the credit bureau with this information, in order for the credit bureau to be able, with 100% certainty, have the capacity to implement an accurate and error-free system for users and consumers.

3- Issues related with Consumer Protection, Bank Secrecy, etc.

Consumer protection issues and rights were discussed at length. Discussions addressed the issue within the context of Egyptian laws pertaining to information protection rights.

The basics concepts discussed were the following:

- 1) Protection of the CBE from any liability or direct responsibility for the data provided by the financial institutions.
- 2) Protection of the credit bureau regarding any premature liability or demand from an end-user.
- 3) The consumer's right to have personalized access to their credit report and how to address issues regarding incorrect data.
- 4) Non-disclosure of information regarding a client's activities within banks and other information under the umbrella of bank secrecy/confidentiality.

We suggested some amendments to the Requirements and Procedures to License Credit Bureaus, the Credit Bureau's Operating System, the Central Bank Supervisory System Draft, still pending CBE Board of Directors approval.

4- Issues related to the BCE's Financial Data.

Also discussed was best approaches to handling the financial data stored by the Central Bank and the best way to transfer it the Credit Bureau. It has been our recommendation, for the time being, not to pay excessive attention in the technical issues of the data itself, *but instead in the quality of the information provided*.

This data reported to the credit bureaus should conform to international standards, *and should be directly related to the information that will be provided in the final credit report to the affiliates*.

It has been our recommendation that Central Bank of Egypt should not be too concerned with the technical issues of the data to be supplied to the Credit Bureaus, due to the fact that is primarily the credit bureau's job to ensure the application of sound principles for standardization of data, supplied either by the Central Bank of Egypt or by the affiliates directly. This operation is called within the credit bureau industry "mapping" and is a fundamental structure in the daily operations of any given credit bureau. The basic agreement between the credit bureau and the Central Bank is related to the original source of the data to be supplied, its quality, length of fields, maturities of loans, etc. It is a technical issue that could be very well resolved by both parties.

Obviously, more information from commercial banks such as maturity of loans will have to be required by the Central Bank of Egypt. We also discussed the importance of starting the compilation of loans from L.E. 1.00 to L.E. 30,000. This action is extremely important for the future supervisory role of the Central Bank of Egypt over the financial system in general, and especially for microfinance activity.

Another important issue discussed was the legal contract between the credit bureau and the CBE which prevents any kind of liability (or legal responsibilities) to the CBE with regard to the data transferring process and the reliability of the data provided.

IV. Additional Recommendations to the Central Bank of Egypt

A. Issues related to Operational and Communications Requirements.

It was our recommendation that the CBE should corroborate the existence, from the very beginning of the project, of an integrated and interrelated system through several computer softwares designed to accomplish the credit bureau goals, which should constitute as a whole, a strong, responsive and trustful instrument for the collection of information and dissemination of risk information related to its consumers.

To accomplish this purpose, it should be verified that the use of sufficient and appropriate technology by the credit bureaus is in place from the start to guarantee several essential functions including:

- a) High security standards for data storage and information handling.
- b) Strong, flexible and highly expandable systems to respond to the needs of users and affiliates.
- c) High processing and speed of data dissemination sent by affiliates. In this sense, it is vital that the credit bureau from the very beginning, and in a maximum of five days, accomplish the processing and dissemination all the information transferred either from the Central Bank of Egypt or its affiliates.

- d) Continuous and uninterrupted services, 24 hours a day, 7 days a week (24/7), throughout the year.
- e) A “*mirror*” system. It means equipment and information redundancy to guarantee uninterrupted services, even in the event of a disaster, natural or otherwise.

In order to accomplish the aforementioned, it should be corroborated that the establishment of the Credit Bureau complies with the operational vision of what is known in IT circles as *front office* or *back office systems*, powerful enough to work with operational strength, as well as absolutely independency from each other.

In addition, the Central Bank of Egypt should have the capacity to verify the fulfillment of the following minimum requisites demanded to the credit bureau, either if they are established under a local or an international data processing structure:

B. Front Office

Multiple servers should operate as a strong, fast and flexible *front office*. The *front office* should have redundancy of equipment (server’s duplicity) to avoid interruption of services due to natural or provoked failure.

It is necessary to stress, by minimum capacity standards, the credit bureau should be capable of processing one *million accounts in less than 24 hours*. Every server should be internally configured with redundant disk systems and energy sources and,

- a) At least two Web servers, with two Internet service suppliers, independent from each other.
- b) In spite of the software technology applied to data processing (SQL, Oracle, etc), the credit reporting system should be based on graphic design (HTML, XML/XSL technology, etc) and not merely on text characters, in order to freely allow the inclusion of pictures and any other graphics in the reports.
- c) Powerful and strong redundant disks systems, or RAID disks (Redundant Array Information Disk) that have a high processing speed and a very large data storage capacity. They should all be installed with SCSI connectivity systems and high quality RAID controller cards.

The computer systems auditor of the Central Bank of Egypt should take into account the following requirements:

- Hard disk minimum capacity of approximately 1 terabyte, with update RAID redundancy technology.

- Updated and very high speed state-of-the-art CPU processors and RAM memory large enough to support a very strong operating load.
- Minimum processing capacity of one million accounts in less than 24 hours is in place.
- Final credit reports programming languages are assembled in order to support the inclusion of graphs, pictures, etc.
- Confirm the existence of at least two Web servers supplying services to the credit bureaus and that they are absolutely independent from each other and each with large capacity of disks, processing speed and RAM memory.
- Review the different hardware devices technical guidebooks.

C. Back Office

The *back office* hardware and technological capacity should be very similar to the *front office*. While the *front office* could be offering services to the affiliates or making credit reports, the *back office* should be simultaneously processing data or updating information, without affecting or reducing the *front office's* processing speed.

The Credit Bureau should have the capacity of processing and publishing an online credit report in one (1) second or less.

The information processing systems should be the most precise and accurate in the identification methodology through names, ID's, addresses or telephones, in addition to sophisticated phonetic identification procedures to render a service to affiliates with zero (0) margin of error.

The *back office* should carry out this operation in order to identify precisely and accurately with a unique frequency sequence *who* is the candidate evaluated.

The Central Bank of Egypt computer systems auditor should take into account the following requirements:

- Corroboration that the *back office* servers are provided with disks, processing speed and RAM memory of strong and large capacity, similar to the *front office*. Review the different hardware devices technical guidebooks.
- Confirmation, through field tests, that a credit report processing and online publication capacity is one second or less.

- Verification that the internal data search algorithms, in conjunction with the test information, determine search data times and data search possibilities according to the standards. Consequently, random tests will be carried out.
- Confirmation that there is data search capacity through phonetics capabilities, via random tests.

D. Other Important Requisites

It will be verified that the credit bureau is capable of the following:

a) Installed Electrical Capacities:

The electrical system, either for the operations center or for data processing center, should have operational redundancy equipments including external electric generators and *UPS (Uninterrupted Power Supply)*.

That the redundancy equipments has an installed capacity of at least 40 per cent above the data processing center nominal requirements.

In addition to the redundancy and regarding the electric energy supply, it should be confirmed that all information system equipments (servers, among others) have internally redundant “*power supply*” sources.

The Central Bank of Egypt computer systems auditor should take into account the following requirements:

- Confirm the existence of enough KW’s of energy in the UPS, in addition to the capacity of the eternal electric generator, to bear and exceed a 40 per cent computing center overall electric load.
- Corroborate that the critical mission equipment (servers, etc.) includes independent UPS.
- Review UPS technical guidebooks.

b) Information security:

It is necessary to verify not only the presence and use the most modern, up-to-date, state-of-the-art and complete firewall equipment within the market, but also the updating of information security processes in order to avoid and protect external attempts to corrupt the stored data or to interrupt service. In other words, full protection against *DOS attacks (denials of service attacks or hackers)*.

It should be verified that within the credit bureau there is strict internal control of information manipulation, either by their own staff or others, as well as the restricted access to Internet, e-mails, use of floppy disk drive units or *CDRWs* .

The Central Bank of Egypt computer systems auditor should take into account the following:

- Ensure that the network architecture is absolutely secure and use the latest firewalls technology.
- Check the computing center location/physical structure. Assess the computing center's minimum physical security, such as: restricted entry and the use of security devices, humidity and temperature control, smoke and fire detectors, updated fire control methods, double flooring, etc.
- Analyze the implemented security measures for restricted access to physical devices such as: Internet, e-mails, floppy disk drive units, *CDRW's*, etc, through which sensitive information could be obtained.
- Check the security offered by the software, such as User ID, passwords, time-out period, auditing clues, either about users or operations carried out within the software.

c) Information conversion systems or “Mapping”:

The processing capacities, handling of the data sent by affiliates, and the ability to transfer data into the credit bureau's internal data structure must be analyzed and monitored to ensure that the conversion system allows the processing of multiple formats coming from the affiliates' different information systems.

The credit bureau should provide affiliates with the necessary structures and “field widths” to allow versatility in information processing and dissemination.

The Central Bank of Egypt computer systems auditor should take into account the following requirements:

- The capacity to process different data structures sent by affiliates and to transform them in the structure managed by the bureau.
- Technological platform for the database to be utilized. Review the data base guidebooks and examine policies and procedures of data conversion.

d) Storage capacity:

This will depend on the internal design for databases processing.

Due to the fact that credit bureaus manage historical financial records, the capacity devoted to this should be enough *gigabytes* or *terabytes* to accommodate at the least, the first three years of future operations. Also, it should be confirmed the high storage capacity and the high speed of *SCSI* disks.

The Central Bank of Egypt computer systems auditor should take into account the following:

- Hard disks minimum capacity approximately 1 terabyte, with the latest technology RAID redundancy and high-speed disks.

e) Response capacity:

The Central Bank of Egypt computer systems auditor should confirm that the credit bureau's load-bearing capacity is of at least 20,000 users connected to the system. Similarly, to verify the capacity to respond efficiently and quickly to a minimum of 600 users connected simultaneously and demanding a credit report.

The Central Bank of Egypt computer systems auditor should take into account the following:

- Field tests to ensure that the system has a capacity of at least 20,000 users and 600 simultaneously connected users demanding a credit report.

f) Communications Requirements:

The presence of a minimum of two web servers, connected and providing services through two independent Internet service providers should be corroborated. It should be verified that they are interconnected with the fastest and most efficient communications and telephone enterprises which could offer its services to the credit bureau. At the same time it should be confirmed there is *RAS modems (Random Access Service)* for affiliates lacking Internet services.

If it is the case that credit bureau service is rendered through an external (trans-boundary) data processing center, it should be verified that the firm has additional local servers, not only to be able to create a *VPN (Virtual Private Network)*, but also to offer a "point-to-point" type of connectivity through local *routers* and via *frame relays*.

g) Mechanisms to access and to obtain credit reports:

It will be verified that the multiple bureaus are ready to operate:

- Via *Internet*;
- Via *modem*; ("Client-server" Technology or *Intranet - browser*)
- Via *frame relay*; and,

- Other means, such as: fax, messaging or electronic batch sets. (Pre-digitalized batches requests delivered to the credit bureau in the form of diskette, zip, magnetic tapes, among others)

The Central Bank of Egypt computer systems auditor should take the following into consideration:

- Corroborate the bandwidth to be used, the data transmission speed and the physical devices used in the networks. Optic fiber connectivity in the “last mile” is a plus.
- Web servers offer services through independent Internet providers. To verify which enterprises will provide this service to the credit bureau.
- Assess the possibility of rendering services via modems through RAS (Random Access Service).
- If the Credit Bureau service has external data processing, the existence of a local server able to create a VPN (Virtual Private Network) and to offer point-to-point connectivity through devices such as routers and frame relays should be verified.
- Corroborate the possibility to access and obtain credit reports through: Internet, modems, frame relay (point-to-point) and others.
- To review the hardware technical guidebooks.

h) Organizational and Physical Infrastructure Minimum Requirements:

Verify, during the course of a physical inspection to the institution, the existence of an adequate physical infrastructure, as well as enough physical space for managerial and administrative offices.

In the case that the physical infrastructure is not owned by the credit bureau, verify through the leasing contract what kind of physical infrastructure (for administrative and client service offices) is provided to ensure excellent service to users and affiliates. This includes information collection and services provided to the system end-users or general public, both in Cairo and other Egyptian cities.

From the very beginning, the credit bureau should have a Specialized Service Department for the financial institutions that provides:

- A manager’s office designed to offer such services.
- An end- user training plan and a user’s manual.
- Monitoring of users in order to correct any deficiency or have in place a contingency plan.

Central Bank of Egypt inspectors should corroborate if the Sales Department have, at the national level, a sales plan covering the whole Egyptian territory.

Central Bank of Egypt inspectors should determine if the Client Service Department has structured mechanisms for offering advice and reviewing consumer requests.

Central Bank of Egypt inspectors should determine if the Information Collection Department has a structured plan with enough trained staff able to search for and collect monthly information from all members.

g) Minimum Services and Products Requirements:

To determine what mechanisms are prepared by the credit bureaus to collect credit information for their databases, either from Public Registry of the Central Bank of Egypt, from the financial institutions or from other public and private sources.

Credit bureaus should offer to affiliates direct access via computer and other means 24 hours a day, 7 days a week, year round, the following reports:

- Personal Credits Reports.
- Corporative Credit Reports
- Debtor's Localization Reports, containing among other information: home, office and commercial addresses, as well as home, workplace, relatives or other acquaintances' telephone numbers.

The Central Bank of Egypt inspectors should corroborate that the credit bureau has the capacity to offer the above mentioned reports to the public.

Additionally, it could offer access to the following types of reports:

- Motor Vehicles Reports.
- Insurance Policies and Claims Reports.
- An Early Warning System Report (*E.W.S*), which consists of a parametric and continuous analysis system to keep daily and automatic control on credit movement variations by a particular affiliate, based on the payment record and/or the possible activities in judicial matters, associated to a person or firm, with the purpose of informing the affiliate immediately after the occurrence of the variation, in order of enable him to take preventive measures as considered relevant, in the appropriate time and according to his judgment.

h) Available databases.

The credit bureau should obtain from its affiliates, under contractual agreements between both parties, monthly information regarding accounts receivables, in order to build up the user's or member's payment record that will lead to the ability to establish associated credit risk indexes.

Regarding insurances companies the credit bureau should collect data regarding insured persons, their policies and claims, as well as general vehicle data.

Central Bank of Egypt inspectors should verify mechanisms established by credit bureaus to collect members' information or their account receivables.

An Important Note: We recommend that the Central Bank of Egypt should supply to the credit bureau, constantly and permanently, *every month*, client files and records submitted by banks to the public registry.

Similarly, it should be mandatory that *all banks in the financial system* send to the credit bureau, regardless of being shareholders or simple users of one or several credit bureaus in particular, *the additional information required by the credit bureau from the banks and regulated institutions by the Central Bank of Egypt that is unavailable in the Public Registry.*

It is urgent and of extreme importance that the Central Bank of Egypt upgrade, increase and develop new technological and human resource capacities in order to request, process, expand and distribute complete information regarding the financial system, not only to the credit bureau but also to the whole financial system.

i) Information Dissemination:

It is our recommendation that credit bureau services be available to any institution within the financial system and to any solicitant, either natural or legal, external to the financial system (end- users) in order to evaluate affiliate's prospective clients. It should be verified which end-users have been selected by the affiliate and approved by the credit bureau to receive information and the security levels applied to such information.

It is our final recommendation that the credit reports be solicited with the aim of being used to establish, quickly and precisely, the eligibility of any consumer or firm regarding:

- Approval of a new or renewed credit;
- Aperture of current or saving accounts;
- Aperture of telephone accounts;
- Aperture of commercial accounts in the general;
- Issuing a new Insurance Policy;
- Claiming an accident;
- Tracking a missing insured person; and,

- Recruiting new employees or evaluating the existing ones.

Reports could be used also to track missing debtors, recover compulsive collection accounts, and authenticate information on insurance policies claimants or in connection with any other licit transaction with a consumer or firm.

A final note: It has been our recommendation to the Central Bank of Egypt that the initial licenses should not be limited to one bureau but that it should be allowed, from the initial stages of the project, the free establishment and licensing of additional credit bureaus. This recommendation is made with the objective of :

- Preventing the creation of an information services monopoly.
- Encouraging the healthy competition regarding technology and services.
- Offer more options to the consumer in terms of better services and prices.

Attachment:

PowerPoint presentation delivered August 22, 2005 to the Banks Committee, Central Bank of Egypt, USAID, EFS, and others.