Support to the anti-corruption strategy of Azerbaijan
(AZPAC)

TECHNICAL PAPER ON CREATION OF AZERBAIJAN SYSTEM FOR EXCHANGE AND ANALYSIS OF INFORMATION IN AML/CFT AREA

Prepared by:
Oleksiy Feshchenko
Council of Europe expert
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For more information, please contact:

Technical Co-operation Department *Directorate General of Human Rights and Legal Affairs* *Council of Europe* *67075 Strasbourg CEDEX* *France*	*Tel: + 33 3 88 41 29 76* *Fax: + 33 3 90 21 56 50* *Email: lado.lalicic@coe.int*

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Summary

These recommendations address needs of newly established FIU of Azerbaijan in creation of AML/CFT IT system.
The main user (and creator) of AML/CFT IT system will be FIU. Other part of the system can be used by other agencies (like National Bank, Financial Markets Commission, Anti-Corruption Prosecutor Department).
These recommendations cover only AML/CFT – specific part, common IT tasks like support of bookkeeping, file storage etc. are not described.
Recommendations contain description of possible hardware and software and Stages for the creation of the system.
Currently the following Council of Europe member states have AML/CFT systems similar to Azerbaijani (large volume of threshold reports) and have already created IT systems for FIUs:
- Belarus
- Italy
- Netherlands
- Poland
- Russia
- Ukraine

Experience of these countries will be useful for Azerbaijan FIU in building of the IT system.
Hardware and software costs are for estimation purposes only and represent "maximal configuration". Based on budget restrictions some items may be removed.

Assumptions

Recommendations were prepared based on the following assumptions.

Reports sent to FIU

FIU will receive suspicious transaction reports (STRs) and threshold-based transaction reports (TTRs).
If the planned reporting threshold of 20.000 AZM (approcx. EUR 15.000) is maintained , the FIU will receive several thousand reports per day.
Banks will be the main source of information and will provide reports in electronic format.
Non-banking financial institutions and other reporting entities except banks will send reports mainly in electronic format. Paper reports will be possible only in exceptional cases.

FIU

FIU has an administrative type with the single office in Baku. FIU staff – around 30 people, up to 10 analysts [1](at least involved at some stages of analysis)
FIU has functions:
- STRs/TTRs analysis, transfer of analysis results (case) to the law enforcement agencies
- exchange of information with other FIUs
- exchange of information with other state agencies;
- AML/CFT supervision

FIU has power to freeze transactions.

[1] FIU structure has Analytical department of 5 people. Other departments (Data collection and processing – 7, International cooperation – 4) may be partially involved in analysis of reports and have access to FIU database. So estimate of 10 analysts is made.

Geography and communications

Most of banks have head offices in Baku where the FIU is located.
Branches are located over the country, including the Nakhichevan autonomous region (exclave of Azerbaijan), direct contact of compliance officers of such branches with FIU is possible only via telecommunication channels, sending information by post may cause several days delays.
Reporting entities either own at least one computer connected to internet or have access to such computer.
There is no dedicated government network connecting state agencies. Central Bank provides banks with protected communication system (actually – messages over usual channels with encryption tools provided by Central Bank).

Timing

AML/CFT law is already in force for more than half year. Yet without Director of FIU appointed and FIU staffed, no reporting requirements were issued. This prevented financial institutions to start building their IT reporting systems.
The Azerbaijani officials anticipate that FIU will be operational by December 2009 (see MONEYVAL 3rd public statement on Azerbaijan, 24 sep 2009)/
First stage of the system (receive, store and simple search of reports in FIU) can be created in approximately 6 months. Next stages will require several years.

Parts of AML/CFT IT system

System can have two parts:
- IT/analytical system of FIU (IAS)
- Common Information System (CIS) connecting FIU and other law enforcement agencies.

IT system functions and tasks. Stages of creation.

Stages to create IT system

It is possible to create system in several Stages

Stage	Expected results	Comments
1	FIU is able to receive reports from banks and store them in database. FIU is able to make a simple search in database and produce statistics	Stage 1 should be done as soon as possible. After completing the Stage 1 FIU will be able to do analysis at least on "from crime to money" basis and process requests of law enforcement and other FIUs – i.e. operational according to the Egmont Group requirements
2-IAS	FIU is able to receive reports from all reporting entities. FIU is doing data cleaning and is able to assess TTRs/STRs risks and to do visual analysis	This Stage will provide FIU the ability to do analysis

	FIU has electronic system for case management	"from money to crime"
2-CIS	State agencies have their parts of CIS installed and connected. EIS participants can exchange data.	Stages 2-IAS and 2-EIS may be done simultaneously
3	FIU is doing data cleaning of EIS information and is able to compare IAS and EIS data. EIS supports electronic dossiers of 'joint cases' (investigations of several agencies involved)	EIS is fully functional
4	FIU has datawarehouse and applies data mining and pattern search methods	FIU makes full use of all information available

IAS functions and tasks

#	Function	Task	Comment	Stage
1.	Receive reports			1,2
1.1		Maintain register of reporting entities		1
1.2		Get electronic reports from banks		1
1.3		Get electronic reports from non-banking entities		2
1.4		Data entry from apper reports	Should be minimized (if allowed)	2
1.5		Check reports for errors		1
1.6		Send electronic receipt to reporting entity on report accept/error		1
1.7		Keep archive of original received reports	Used to resolve legal disputes with reporting entities (e.g. when applying sanctions for wrong reporting) and to debug the system	1

1.8		Reports transformation and load to data warehouse		1
2.	Running data warehouse (WH)			1,2,3,4
2.1		Running first level of WH (normalized data from reports and state agencies)	Minimal WH level, allows search and statistics	1
2.2		Running register of persons (transaction participants)	Register is necessary to identify persons known to FIU and other state agencies. Without such register FIU will be quickly overloaded with "duplicates" (records on the same person) that makes advanced analysis impossible.	2
2.3		Data cleaning	Identification of persons according to the register	2,3
2.4		Running second level of WH	Second level contains cleaned data from the first level linked with the register of persons. Also second level of WH contains electronic FIU cases. Second level allows: - clinking reports and other databases - visual analysis	2,3
2.5		Running third level of WH	Second level has data though cleaned but of different nature (received from different sources). Third level has more abstract objects (person, transaction, property object), details are kept at second level. Third level allows: - visual analysis of large data volume; - finding hidden links and patterns (data mining)	4

3.	Analysis of reports and related information			1,2,3,4
3.1		Ml/TF risk assessment of incoming report		2
3.2		Selection of reports for investigation	Based on Ml/TF risk and other criteria	2
3.3		Assignment of cases to FIU specialists		2
3.4		Search of information on the object given		1
3.5		Compare information from different sources		2
3.6		Visual analysis of links between objects		2
3.7		Compiling case files		2,3
3.8		Finding hidden links and patterns		4
3.9		Finding transaction chains according to the pattern		4
3.10		Statistics analysis	Basic statistics is quite simple (Number of reports etc), it is used for making decisions Advanced statistics is used to find anomalies (like outburst of transaction with certain region) and analyze their sources	1,2
4.	Case management			2,3
4.1		Running electronic FIU case dossiers		2

4.2		Keeping track of processing FIU cases by law enforcement		3
4.3		Running electronic case files of joint investigations		3
5.	Support exchange of information with other FIUs			1,2
5.1		Keep records on FIUs requests and responses	At the beginning the simple table of correspondence is enough. Further the FIU exchange may be kept in case dossiers	1,2
5.2		semi-automatic compiling of requests and responses to FIUs		2
6.	Data protection			1,2,3
6.1		Logging users' access to WH		1
6.2		Backup copies of WH		1
6.3		Create a reserve WH		2
6.4		Create a reserve IAS (disaster recovery facility)		3

CIS functions and tasks

#	Function	Task	Comment	Stage
1.	Data exchange between CIS participants			2

1.1		CIS participants upload data to their subsystems	Some data (like companies registration) may be uploaded to CIS servers, other data (like criminal records) are uploaded after request	2
1.2		Excahnge data between CIS nodes		2
2.	Running electronic dossiers of joint investigations			3
2.1		Running database of joint investigations	Every CIS participant who starts joint investigation uploads data into CIS	3
2.2		CIS users access joint investigations database		3
2.3		Getting statistics on joint investigations		3

Hardware and software for IAS

IAS structure

For the data protection reasons data warehouse and analytical software should run in one network (protected IAS segment) separated from network (open IAS segment) connected to outer world. Data between two segments is transmitted several times per day or on request.

Servers and workstations

Possible configurations :

#	Purpose	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Database server	2 CPU x Quad-Core 3GHz, RAM 8Gb, RAID storage controller, 2 HDD * 140 Gb, 1x FC adapter, 2x Gigabit	5000	2	10000	1 main and 1 reserve server

		Ethernet				
2.	Data storage solution	CPU Quad-Core 2GHz, RAM 2Gb, RAID array up to 56 FC HDDs (installed 10*300 Gb)	40000	1	40000	
3.	Application, communication etc servers	2 CPU x Quad-Core 2GHz, RAM 4Gb, RAID storage controller, 2 HDD * 140 Gb, 2x Gigabit Ethernet	4000	8	32000	Protected segment: 1 application server, 1 file-server, 1 communication server Open segment: 1 application server, 1 file-server, 1 communication server, 2 web-servers
4.	Workstations	CPU Quad-Core 2.5 GHz, RAM 4 Gb, HDD 500 Gb, LCD 22"	1200	40	48000	Workstation for all FIU staff plus 10 stations for the protected segment
				Total	130 000	

Printers

It is enough for FIU to have fast b/w A3 printer per 5 persons in every segment (i.e. one per room), one large multifunctional printer/scanner/copier A3, one color A3 printer in both segments and A0 plotter for charting complex schemes in the protected segment.
Every 5 people should get flatbed scanner and shredder. One large shredder should be installed in FIU

#	Purpose	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Plotter	A0, color ink, Ethernet, RAM min 256 Mb, 1440 dpi, 4 sq.m. per hour, roll feed, cutter	7000	1	7000	
2.	Laser printer A3	A3 laser b/w, 1200 dpi, RAM 32Mb, 20 ppm, duplex, Ethernet	2000	8	16000	One per 5 persons (in both segments)

3.	Multifunctional printer	A3 laser b/w copier/printer/scanner, 25 ppm, 600 dpi, HDD min 40 Mb, Duplex, Ethernet, LAN Scan, Paper handling >2500 sheets, finisher stapling. Protected printout, network authentification, IP-filtering. audit of print/copy/scan/network access	7000	1	7000	
4.	Color printer	A3 laser color, 600dpi, RAM 64Mb, 10 ppm, Ethernet	5000	2	10000	
5.	Flatbed scanner	A4 flatbed, USB, 1200 dpi	60	6	360	
6.	Small shredder	Cross-cut, feed 220 mm, 5-7 sheets, security level 3	400	5	2000	
7.	Large shredder	Cross-cut, batch feed 460 mm, 55-70 sheets, Security level 3	10000	1	10000	
			Total		52360	

Operation systems and office software

Most of analytical products for FIU run under Microsoft Windows, so operational systems and office software costs are estimated based on Microsoft prices:

#	Purpose	Specification	Approx. price, USD	Quantity	Cost, USD
1.	Server 64-bit OS	3000	11	33000	
2.	32-bit workstation OS	-	40	-	Included in workstation price
3.	Office software	600	40	24000	
			Total	57000	

Database management system

Taking into account large volume of data, FIU needs powerful industrial database managemet system. It should also support OLAP and data mining technologies. Based on choice of other FIUs estimate is done based on Oracle products

#	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Oracle	93 000	4	352 000	License prices per

	Enterprise Edition, OLAP andta Mining options				one processor x 2 servers x 2 processors

Data loading and transformation system

It is supposed that FIU will receive reports in XML format
FIU may design own extract, transformation and load (ETL) system or use available open-source solutions. As for "maximal configuration" below there is an estimate based on industrial solution like OpenText Genio.

#	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Extract, transformation and load (ETL) system	70000	1	70000	

Business Intelligence

FIU with large data volume use Business Intelligence (BI) products for review, search, risk assessment and selection of reports, statistical analysis, producing reports. Usually BI and link visualization software are two main tools of analyst.
Usually BI tools have client-server architecture, user has a web-interface, and analyst works with business objects (not with database tables).
There are some leading BI solutions on the market like Cognos, Business Objects, Microstrategy, SAS etc.
Below is a cost estimate for BI component based on the MicroStrategy solution for 10 users.

#	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Developer Kit	10000	1	10000	
2.	Desktop Designer	4000	1	4000	Client application for advanced users/developers
3.	Server components, licensed per user	800	10	8000	
4.	User modules, licensed per user	1300	10	13000	
			Total	35 000	

Links visualization software

BI tool is used to analyze data in the table format and to detect possible cases of money laundering. But when the subjects of investigation are identified analyst should be able to quickly get the picture of their transactions and connections. This is exectly what links visualization software is designed for. Also charts produced by links visualization software allow to produce charts that easily explain to law enforcement the money laundering case.
There are some links visualization solutions on the market, most used by FIU are i2 and Visual inks. For both products average price per user is around USD 7 000.

#	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Link visualization tools	7000	10	70 000	Average price per user includes costs of server components, database connectivity ets
			Total	70 000	

Workflow tool

FIU should have workflow and document management system for electronic dossiers of investigations. In addition to the standard features of the workflow software should be the integration with FIU electronic dossiers. There is a number of workflow software available on the market, e.g. some FIUs reported to use OpenText Livelink ECM – Advanced Workflow, SAP ICM (investigative cases management) or Microsoft Sharepoint Server
Cost of workflow systems is around 50000 USD

Data Mining

At the last stage of development IAS will be able to use Data Mining tools to detect hidden links and patterns in financial transactions. It will be also possible to use models based on typologies to automatically detect suspicious sequences of transactions.
FIUs that use data mining most frequently use SPSS Clementina. It can be integrated also with Oracle database and BI tool Microstrategy.
SPSS Clementina cost is around USD 70000

Cost estimate on IAS creation

So cost estimate for hardware and software (in maximal configuration) to create IAS (IT system for FIU) is:

#	Category	Cost, USD
1.	Servers and workstations	130000
2.	Printers, copiers, shredders	52360
3.	Operation systems and office software	57000
4.	Database management systems	352000
5.	ETL (extract, transformation and load) software	70000
6.	Business Intelligence software	35000
7.	Links visualization software	70000
8.	Workflow software	50000
9.	Data Mining software	70000

	Total	**886360**

These costs do not include:

- Design of the entire system, creation of software by FIU;
- Maintenance of hardware and software (up to 20% of equipment/software cost per year);
- Network design and creation;
- Reserve power sources;
- Equipping server rooms with air condition and fire extinguishing systems;
- Design and creation of access control and video surveillance in the FIU premises.

Hardware and software for CIS

CIS participants

The following state agencies may be participants of the common AM/CFT information system (CIS):

#	Agency	Data provided to CIS[2]	Participation in investigations
1.	FIU	Number of reports submitted to FIU by reporting entities	Yes
2.	Anti-Corruption Department of General Prosecutor's Office	No	Yes
3.	Ministry of Internal affairs	Criminal records	Yes (if involved by prosecutor's decision)
4.	Ministry of National Security	No	Yes
5.	Tax Service	Taxable income Register of taxpayers	No
6.	Customs Service	Export-import cargo declarations Data on cross-border cash movements	No
7.	National Bank	Bank supervision data	Yes
8.	State Committee for Securities	Supervision data	Yes

[2]Resources provided to CIS are not necessary visible to all CIS participants. Range of data available to every participant, access mode and necessary preconditions will be configured according to the legislation and interagency agreements.

Structure of CIS

Every participant of CIS will get dedicated server. This server will be physically separated from the network of participant and connected to the secure network (that includes only dedicated servers of CIS).
All servers should be administered from one center, most likely located in FIU. In order to increase mutual confidence the system may be administered by the group of specialists from different agencies. In any case it is advised to have a Supervisory Board of CIS with all participants of CIS represented.

According to the agreed procedure participants of CIS upload/update data on their dedicated servers. These uploads/updates are either copies of their databases or extracts from databases selected upon request from other participant.
Format of data on dedicated servers is defined by one common regulation, all servers have the same software. All participants of CIS ensure data transformation between their system and CIS by their own means.
So, when one participant (say – FIU) needs information from other agency, FIU creates request in its' IT system (automatically or initiated by user) and uploads this request to CIS server of FIU. Request is transmitted by CIS to the server of other agency and is processed there. If data requested are not on the server, it generates request to the IT system of other agency and requested data are uploaded on server. Finally requested data are transferred to the FIU CIS server and then downloaded to the FIU IAS system.

As far as CIS will provide secure connection between agencies involved in joint investigations, it is possible to launch the document workflow and collaboration on electronic case dossier.

CIS hardware

Every CIS participant should get one database server and one application server with the same specifications as IAS servers (see 0)

#	Purpose	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	Database server	2 CPU x Quad-Core 3GHz, RAM 8Gb, RAID storage controller, 2 HDD * 140 Gb, 1x FC adapter, 2x Gigabit Ethernet	5000	8	40000	
2.	Application etc. servers.	2 CPU x Quad-Core 2GHz, RAM 4Gb, RAID storage controller, 2 HDD * 140 Gb, 2x Gigabit Ethernet	4000	8	32000	

				Total	72000	

CIS software

Every CIS participant develops by his own the software to exchange data between CIS server and its' IT system. CIS servers will get similar software to process CIS requests. Necessary system software is operation and database management system.
One of possible solutions is the use of Microsoft operational systems and database. Workflow and document exchange can be done with Microsoft Sharepoint Server

#	Specification	Approx. price, USD	Quantity	Cost, USD	Comment
1.	MS Windows Server 2003	3000	16	48000	
2.	MS SQL Server x64 Enterprise Edition	18000	8	144000	Price per processor
3.	MS Sharepoint Server 2007	7000	6	42000	6 agencies take part in investigations
			Total	234000	

Total CIS costs

Cost estimate for CIS hardware and software is:

#	Category	Cost, USD
1.	Servers	72000
2.	Software	234000
	Total	**306000**

Costs above do not include cost of creation of network and creation of software in every participating agency