



Central Election Commission of the
Republic of Moldova



UNDP Project "Improvement of the quality of
democracy in Moldova through electoral and
parliamentary support "

TERMS OF REFERENCE

for implementation of
*the Procedure of Data Import from
the State Registry of Population*

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Introduction

A key objective of the *Central Election Commission* is to have a well structured up-to-date database of Moldovan citizens with voting rights. This would ensure the *CEC's* ability to organize elections at any time.

Based on the *Concept of State Automated Information System "Elections"* to update the data on voters, the *SAISE* must integrate the following state registers:

- State Registry of Population;
- State Registry of administrative and territorial units and streets of settlements throughout Moldova;
- Judiciary Registry;
- Mobilization Registry.

However, currently the *SAISE* does not integrate with all registries, because of the 4 above only the *State Registry of Population* is functional (which was documented in the audit mission report of the *Court of Accounts of the Republic of Moldova*). Although the *SAISE* has *SRP* data import functionality at the moment this functionality is abandoned because it is not functional and no one knows with certainty the mechanism of its functionality.

The *State Registry of Population* is a key information resource providing reliable official information on the identity of Moldovan citizens and their identity documents. For the requirements of the IT system of the *Central Election Commission* of the *State Registry of Population* it is appropriate to extract the following categories of information:

- Data on voter's identity (name, birth date, gender, etc.).
- Data on voter's residence;
- Data on voter's identity documents.

Although currently the information on conscripts cannot be automatically imported and convicted persons without voting right and people with status of "pupil" and "student" learning in a place other than their residence cannot be identified, we can say with certainty that the automated import of information from the *SRP* would provide identity information of people with voting right with high accuracy (exception: convicted people deprived of the voting right).

The *Module of data import from the State Registry of Population* will enable the elimination of inconveniences generated by existing procedures of analysis and import of data from Microsoft Excel provided by the *SE "CRIS Registru"* and automation of all update processes of the *State Registry of Voters* based on the information held by the key authority documenting the Moldovan population. The import process automation will allow scheduling of data import tasks not detrimental to the performance of work of the IT systems of the *Central Election Commission* and the *SE "CRIS Registru."*

This document presents a conceptual vision on the creation and operation of the *Module of data import from the State Registry of Population*, including aspects on the goal and objectives, principles, basic features, functionality and conceptual architecture, etc. of the IT system.

1. Background

The Law no. 101 of 15 May 2008 on the Concept of State Automated Information System "Elections" published in the Official Monitor No. 117-119 of 04 July 2008 does not explicitly delimit the need to automate the import of data on voters, but specifies that the electoral lists are compiled at the first stage on the base of the *State Registry of Population* and once the *State Registry of Voters* is created, based on this register.

Given that the *State Registry of Voters* has not yet been developed and put into production (there are only few attempts to conceptualize it), currently the CEC is at the first stage of data extraction from the *State Registry of Population*.

We know with certainty that the *State Registry of Population* provides a WEB service through which it is possible to develop IT mechanisms for automated extraction of data (such functionality is implemented, for example, within the *Registry of Public Functions and Civil Servants*). However, currently the CEC receives data in *Microsoft Excel 2000* format which generates a number of difficulties in updating a data collection on Moldovan voters such as:

- received files may cannot exceed 64,000 records (so that for Chisinau more files are received);
- Excel format involves automatic detection of the type of data contained, so that often the character data type is treated as numeric (zeros before the ID number or IDNP code are removed or codes are shown as real numbers).

To address those impediments it is appropriate to develop a way to import data from the *State Registry of Population* that would update the data collection on Moldovan voters automatically.

1.1. Terms used in the Terms of Reference

All acronyms and abbreviations used herein are defined in Table 1.1.

Table 1.1. All abbreviations and acronyms used herein

No.	Abbreviation / Acronym	Description
1.	CPA	Central Public Authority
2.	LPA	Local Public Authority
3.	DB	Database
4.	CEC	Central Election Commission
5.	CATUM	Classification of Administrative and Territorial Units of the Republic of Moldova.
6.	SRV	State Registry of Voters
7.	SRP	State Registry of Population
8.	DBMS	Database Management System
9.	ITS	IT system
10.	SAISE	State Automated Information System "Elections"
11.	IT	Information Technology
12.	ICT	Information and Communication Technology

All common definitions used herein are defined and explained in Table 1.2.

Table 1.2. All definitions of terms used herein

No.	Abbreviation / Acronym	Description
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No.	Abbreviation / Acronym	Description
1.	Database	Set of data organized according to its conceptual structure that describes the basic features and the relationship between entities.
2.	Data	Elementary information units about people, issues, facts, events, phenomena, processes, objects, situations, etc. presented in a form allowing notification, commenting and their processing.
3.	Workflow	Administrative process of an organization during which tasks, procedures and information are processed and executed in a specific sequence dictated by predetermined rules (procedure rules) in order to make up a product or provide a service.
4.	Data integrity	State of data when they keep their content and are interpreted unambiguously in cases of random actions. The integrity is deemed preserved unless the data were altered or damaged (deleted).
5.	Metadata	Way of assigning semantic value to the data stored in the database (data about data).
6.	IT system	Set of software and equipment that ensures automatic data processing (automated information system component).
7.	Information system	Set of processes and tools for collection, processing and transmission of information required for management (includes manual and automatic data processing technologies).
8.	Information and communication technology	Common term that includes all technologies used for information exchange and processing.
9.	Reliability of data	Level of correspondence of data stored in computer memory or documents to the actual state in the system that are reflected by these data.

1.2. References and Legal Issues for the IT System Development

The processes of creation, implementation and operation of the *Module of data import from the State Registry of Population* shall not contradict the relevant regulatory and legal documents in force on the activity of CEC and development of IT solutions for central public authorities. Some documents of this category are the following:

1. *Law no. 101 of 15 May 2008 on the Concept of the State Automated Information System "Elections"*, Official Monitor no. 117-119 of 04 July 2008.
2. *Law no. 1381 of 21 November 1997 on the approval of the Election Code*, Official Monitor no. 81 of 08 December 1997.
3. *Law no. 764 of 27 December 2001 on the administrative and territorial organization of the Republic of Moldova*, Official Monitor no. 16 of 29 January 2002.
4. *Central Electoral Commission Decision no. 137 of 14 February 2006 on the approval of the Regulation on CEC activity (amended by the Resolution no. 24 of 05 April 2011)*.
5. *Central Electoral Commission Decision no. 3364 of 23 July 2010 on the approval of the Regulation on the compilation, management and updates of electoral lists (as amended by the Decision no. 33 of 08 April 2011)*.
6. *Law no. 982 of 11 May 2000 on access to information*, Official Monitor no. 88 of 28 July 2000.
7. *Law no. 1069 of 22 June 2000 on informatics*, Official Monitor no. 073 of 05 July 2001.

8. *Government Decision no. 735 of 11 June 2002 on special telecommunications systems of the Republic of Moldova*, Official Monitor no. 79-81 of 20 June 2002.
9. *Law no. 467-XV of 21 November 2003 on computerization and state information resources*, Official Monitor no. 6-12/44 from 01 January 2004.
10. *Government Decision no. 840 of 26 July 2004 on the creation of the Telecommunications System of public administration authorities*, Official Monitor no. 130 of 30 July 2004.
11. *Law no. 133 of 08 July 2011 on personal data protection*, Official Monitor no. 171-175 of 14 October 2011.
12. *Law no. 71-XVI of 22 March 2007 on registries*, Official Monitor no. 70-73/314 of 25 May 2007.
13. *Order no. 94 of 17 September 2009 of the Ministry of Information Development on the approval of some technical regulations (procedure of record of electronic public services, provision of electronic public services, ensuring information security upon the provision of electronic public services, determination of the cost of development and implementation of automated information systems)*, Official Monitor no. 58-60 of 23 April 2010.
14. *Government Decision no. 1123 of 14 December 2010 on the approval of the Requirements for the provision of personal data security during their processing in information systems of personal data*, Official Monitor no. 254-256 of 24 December 2010.
15. *Standard of the Republic of Moldova SMV ISO CEI 15288:2009 "Systems and Software Engineering. Processes of the system life cycle."*
16. *Technical regulation "Processes of the software life cycle" RT 38370656-002:2006*, Official Monitor no. 95-97/335 of 23 June 2006.
17. Other laws, regulatory acts, standards in force in the area of election and ICT.

1.3. Basic Principles of the IT System

Upon designing, creation and implementation of the IT system the following general principles shall be taken into account:

- **Principle of legality:** which implies the creation and operation of the IT system in accordance with the national law in force and the relevant internationally recognized norms and standards;
- **Principle of reliable data:** provides the data input in the system via authorized and authenticated channels only;
- **Principle of information security:** implies a proper level of integrity, selectivity, accessibility and effectiveness to secure data against losses, alterations, damages and unauthorized access.
- **Principle of transparency:** requires the design and implementation according to the modular principle, using transparent standards of information and telecommunications technologies;
- **Principle of expansibility:** stipulates the possibility of extension and completion of the IT system with new functions or improvement of the existing ones;
- **Principle of priority of first person / single centre:** implies the existence of a senior responsible person with sufficient rights to make decisions and coordination of activities to create and operate the system;
- **Principle of scalability:** implies the provision of a constant performance of an IT solution upon the increase in the amount of data and request of the IT system;
- **Principle of simplicity and convenience of use:** implies the design and implementation of all applications, hardware and software resources available to the System users, based exclusively on visual, ergonomic and logical principles of design.

In particular, for the IT system architecture the following major principles are required:

- provision of adequate security of the IT system to protect information and component subsystem against their unauthorized use or disclosure of personal information or information with limited access;
- recognition of information as property and its proper management;
- minimizing the number of different technologies and products that offer the same or similar functionality by destination.

1.4. Destination, Objectives and Tasks of the IT System

The Module of data import from the State Registry of Population shall be developed in the context of the SAISE compliance to the Law no. 101 of 15 May 2008 on the Concept of State Automated Information System "Elections" and the Audit Mission Report of the Court of Accounts of the Republic of Moldova approved by the decision of the Court of Accounts of the Republic of Moldova No. 3 of 28 January 2013. This module will be a key mechanism for the automatic strengthening and update of the database of the State Registry of Voters.

The creation and implementation of the Module of data import from the State Registry of Population will allow achieving the following major objectives:

- establishment of a planned frequency during which the module of data import from the SRP will be launched;
- increase in data accuracy due to the direct import of data from the SRP and giving up the use of some intermediate files in Excel format;
- reduction of the time and resources required for the process of consolidation and update of collection of data on Moldovan voters.

The Module of data import from the State Registry of Population shall replace the similar functionality implemented in the SAISE which is currently abandoned because it does not work properly, and its operating principles are unknown.

2. Architecture of the IT System

The Module of data import from the State Registry of Population will be an IT application initially installed in the data centre of the Central Election Commission (the installation and its operation in the government cloud - M-Cloud shall be made possible) that will be able to be launched on demand or as planned by administrators or authorized users of the system (from the control file or configured as service to automatic work, etc.).

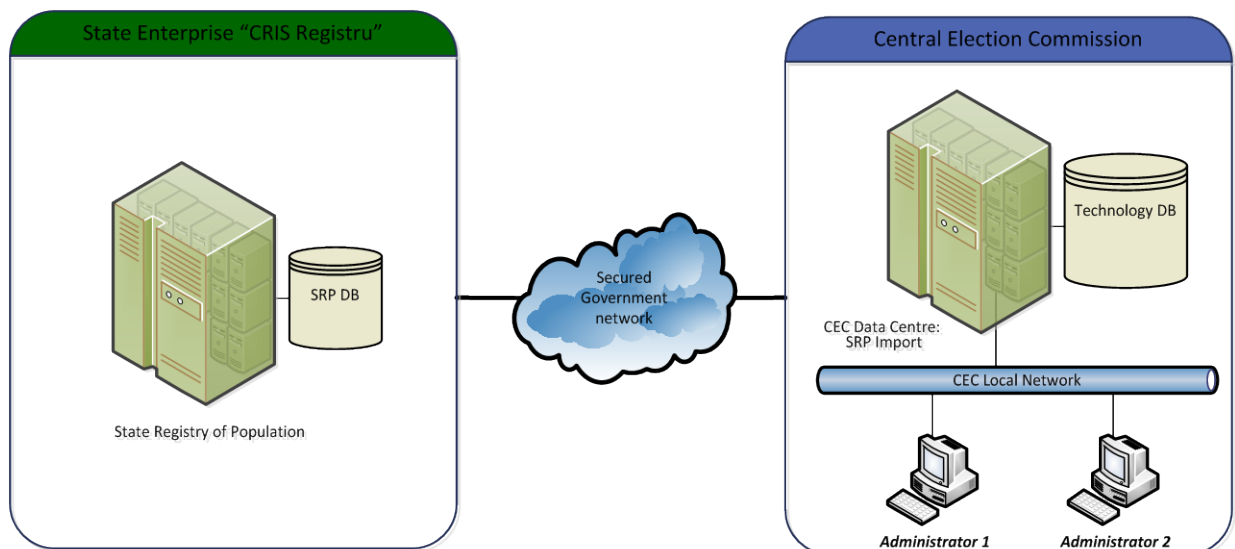


Figure 2.1. Architecture of the Module of data import from the State Registry of Population.

As shown in figure 2.1, the cooperation IT solution of resources to use and administrate the *Module of data import from the State Registry of Population* consists of 2 distinct types of nodes:

- **Contour of the SE "CRIS Regstru"** - the data centre of the *State Enterprise "CRIS Regstru"*, which provides the WEB service of access to the *SRP* and hosts the *State Registry of Population*;
- **CEC Data Centre** – the *CEC* servers on which the *Module of data import from the State Registry of Population* will be installed and that will interact with the *SRP* to update the *SRV* technology database (in perspective, the module of import from the *SRP* could be hosted in *M-Cloud*).

All connections between the nodes involved in the operation of the *Module of data import from the State Registry of Population* will be made through secured connections.

3. Parties Involved and Roles of the IT System

3.1. Business Roles of the IT System

The following entities are concerned or shall be engaged in the development and proper operation of the IT system:

- The **Central Election Commission** is a standing public institution established to implement the election policy for the proper organization and conduct of elections. The mission of the Central Election Commission is to create optimum conditions for all Moldovan citizens to freely exercise their constitutional voting right and to be elected in free and fair elections. The *CEC* is responsible for the administration and operation of the *Module of data import from the State Registry of Population*.
- The **State Enterprise "State Information Resources Centre "Regstru" (SE "CRIS "Regstru")** is an enterprise subordinated to the Ministry of Information Technology and Communications, aimed to implement integration projects and form information resources. As owner of the *State Registry of Population*, the *SE "CRIS Regstru"* will deliver the WEB service accessed by the *Module of data import from the State Registry of Population* to collect or update data designed for the *State Registry of Voters*.
- The **Ministry of Information Technology and Communications** as the main body of policies and rules on the development and implementation of state information resources.

In the future, other public authorities of the Republic of Moldova shall be involved that will develop IT systems to strengthen and update the information content of the *State Registry of Voters* as:

- **Ministry of Justice** – this connection shall be provided to enable the automated receipt of data on persons temporarily deprived of their voting right at the time of development of the *Judicial Registry*.
- **Ministry of Defence** - this connection shall be provided to enable the automated receipt of data on military persons at the time of development of the *Mobilization Registry*.
- **Ministry of Labour and Social Protection** - this connection shall be provided to enable the automated receipt of data on persons in care centres, retirement homes, etc. at the time of development of the *Automated Information System "Social Assistance"*.
- **Ministry of Education** - this connection shall be provided to enable the automated receipt of data on the temporary residence of pupils and students with voting right studying in other places than the place of their residence at the time of development of the *Registry of Pupils and Students*.

3.2. Holder of the IT System

The holder of the IT solution is the *Central Election Commission*. The role of holder of the system reflects the administrative aspect related to the *CEC* competence. The technological aspect of the *Module of data import from the State Registry of Population* will be administered by the *IT* subdivision of the *Central Election Commission*. The *CEC* is responsible for the smooth operation of the module and information of public authorities serving as data target for import in the event of technical problems or needs for massive imports or checks.

Where a WEB service is developed for the implementation of the use case of UC06, its holder will be SE "CRIS Regstru."

3.3. IT System Administrator

The *Module of data import from the State Registry of Population* will be hosted in the IT infrastructure of the *Central Election Commission* and will be administrated by the CEC IT subdivision.

The system administrator has full access to all the system functionalities, files and databases, rooms where equipment and machinery of software applications is located or that ensure the security of data managed by the *Module of data import from the State Registry of Population*.

The Administrator's responsibilities are as follows:

- ensuring the normal operation of the IT system by ensuring data availability, security and integrity;
- at the written request of the owner of the Registry, the administrator changes the system functionality (within the possibilities allowed by the system), etc.;
- performance of technical management of the system infrastructure, which provides:
 - a) management and provision of operation of the technical equipment of the software applications including the elimination of security of the perimeter of the network and data access.
 - b) holding or lease of channels of access in broadband Internet and government network;
 - c) management of the WEB server of applications through which services included in *the Registry* are provided.

3.4. Users and their Roles in the System

The human roles or other systems that interact with the *Module of data import from the State Registry of Population* are shown in Figure 3.1.

Authorized user of the module of import from the SRP - all users of the *Central Election Commission* that interact with the *Module of data import from the State Registry of Population*. These users will have the following roles:

- configuration and assignment of tasks of import from the *Module of data import from the State Registry of Population*;
- extraction of logs to compile statistics and reports;
- view of important results (using external applications).
- other activities.

Administrator - human player empowered to ensure the functionality of the *Module of data import from the State Registry of Population* in good conditions. If the technological environment in which the IT system will operate includes capabilities sufficient to perform the administration works and then their implementation in the system is optional.

This category of players has the following distinct roles:

- access to all the functionalities accessible to authorized users;
- configuration of the automated triggering mechanism of the import procedure;
- start / suspension of operation of the *Module of data import from the State Registry of Population*;
- monitoring of the operation of the *Module of data import from the State Registry of Population*;
- ensuring information security;
- administration of the database;

- management of interfaces for interconnection with external and internal systems.

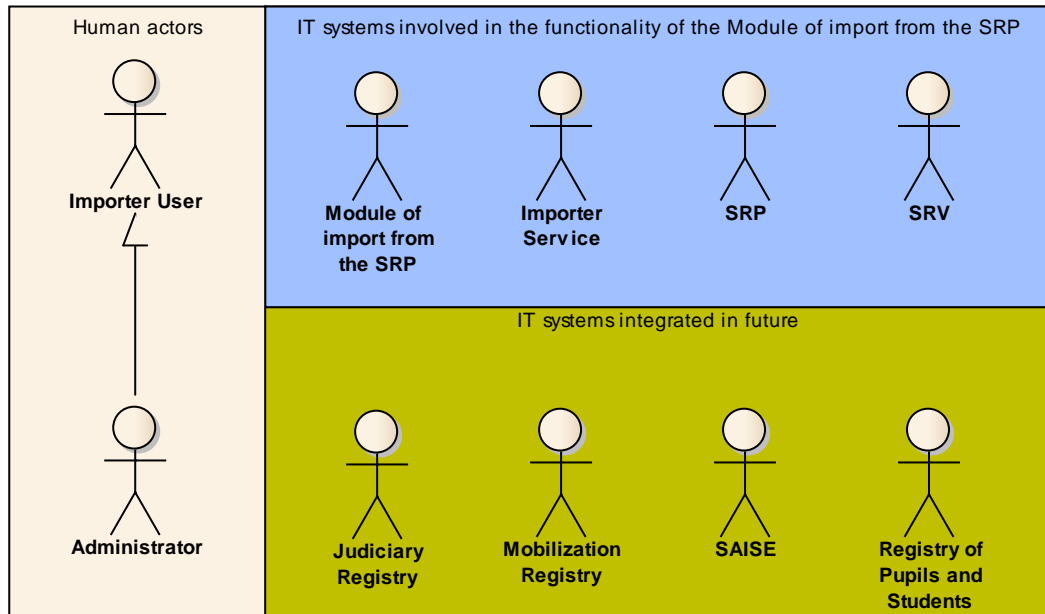


Figure 3.1. Players of the IT System.

Module of import from the SRP – IT system to be developed (*Module of data import from the State Registry of Population*).

Importer Service - a service of the operating system installed and configured to automatically trigger the import procedure defined on the basis of configurations and schedule defined in advance by the Administrator

SRP – the *State Registry of Population*, main source of data used to insert, check the data of identification and updating of voters' profiles in the *State Registry of Voters*.

SRV - SAISE IT subsystem for which data collection will be imported. The interaction with this system is limited only to the phase of use of the technology database and its nomenclatures to store the important data.

In the future, the integration with external IT systems from which data could be extracted necessary to update the data collection of the *State Registry of Voters* should be provided could be provided for the *Module of data import from the State Registry of Population*.

This category of external IT systems could include:

Judiciary Registry - held by the *Ministry of Justice* for automatic extraction of data on persons temporarily deprived of their voting right.

Mobilization Registry - held by the *Ministry of Defence* for automatic extraction of data on military persons.

SAISE – IT system of the *Ministry of Labour, Social Protection and Family* (*Automated Information System "Social Assistance"*) for automatic extraction of data on persons from care centres, retirement homes, etc.

Registry of Pupils and Students held by the *Ministry of Education* for automatic extraction of data on the temporary residence of pupils and students with voting right studying in other places than the place of their residence.

3.5. Interaction with other IT systems

To ensure the functionality in optimum conditions of the *Module of data import from the State Registry of Population* the interaction with 3 categories of IT systems is required

1. Interaction with the State Registry of Population.

This interaction is one of the main objectives of implementation of the *Module of data import from the State Registry of Population* and consists in the formulation of some queries to the database of the *State Registry of*

Population for the receipt via the WEB service provided by the SRP of target information to update the information content of the *State Registry of Voters*.

2. Interaction with the *State Registry of Voters*.

This interaction is one of the main objectives of the implementation of the *Module of data import from the State Registry of Population* and consists in storing all data received automatically from the *State Registry of Population* in the technology database of the *State Registry of Voters* for subsequent integration in the SRV by means of its automatic import modules.

3. Integration with other IT systems.

Since currently the most feasible source of data for the import module is the *State Registry of Population*, the orientation of the import module to the exclusive integration with the SRP is obvious. This specification does not aim to integrate other external IT systems. However, it should be taken into account that other information sources will be developed that could be the target of the automatic data import module:

Judiciary Registry:

At the time of development of the *Judiciary Registry* the possibility of receipt of data on people temporary deprived of the voting right could be ensured.

Mobilization Registry:

At the time of development of the *Mobilization Registry* the possibility of receipt of data on military people could be ensured.

Automated Information System "Social Assistance":

At the time of completion of the AISSA implementation the possibility of receipt of data on persons from care centres, retirement homes, etc. could be ensured.

Registry of Pupils and Students:

At the time of development of the *Registry of Pupils and Students* the possibility of receipt of data on temporary residence of pupils and students studying in other places than their residence could be ensured.

4. Functional Model of the Subject to Automation

4.1. IT Objectives of the IT System

Analyzing the modelled field (provision of the functionality of the *Module of data import from the State Registry of Population*) all information objects to be taken into account upon the development of the IT solution can be distinguished (Figure 4.1).

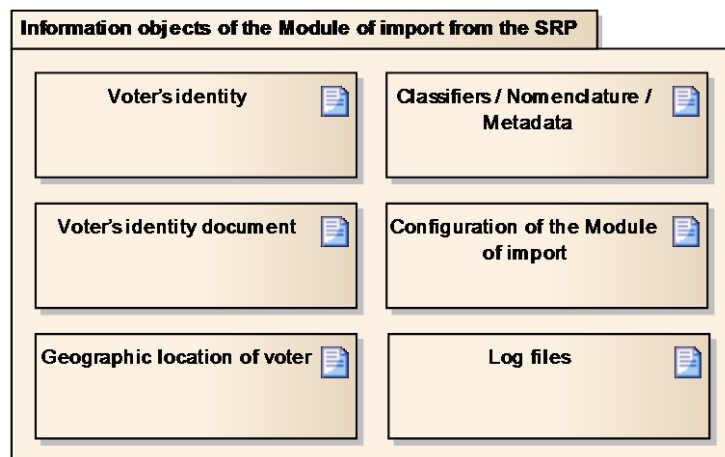


Figure 4.1. Information objects of the Module of data import from the SRP.

There are 6 categories of information objects that must be taken into account in the design and implementation of IT solution:

- User's identity;
- Voter's identity document;
- Geographical location of voter;
- Classifiers / Nomenclature / Metadata;
- Configuration of the Module of data import from the SRP;
- Log records of the logging component.

1. User's identity.

It is a complex information object that contains all the data extracted the *State Registry of Population* that identifies the voter. According to *Law no. 1381 of 21 November 1997 on approval of the Election Code of the Republic of Moldova* to ensure the future functionality of the *State Registry of Population* the following identity data shall be extracted from the *SRP*:

- voter's name;
- voter's surname;
- voter's father name;
- voter's date of birth;
- voter's IDNP code.

2. Voter's identity document.

It is a complex information object that contains all the data extracted from the *State Registry of Population* that define the voter's valid identity document. The following data of the voter's valid identity document will be extracted:

- type of identity document;
- series of identification act;
- identification number;
- issue date of the document;
- expiry date of the document.

3. Geographical location of voter.

It is a complex information object that contains all data extracted from the *State Registry of Population* on the residence of voter. The following data on voter's residence will be extracted:

- voter's district / municipality;
- voter's settlement (sector for voters from municipality);
- voter's street;
- voter's building number;
- voter's apartment number.

4. Classifiers / Nomenclature / Metadata.

These are an institutional object that consists of all metadata related to the IT system. It will contain national and domestic classifiers used in the *Central Election Commission*.

5. Configuration of the Module of data import from the SRP.

It represents configurations that define strategies of data retrieval in and import from the *State Registry of Population*. It represents all rules of the import module operation (schedule of automatic launch, categories of extracted data, etc.).

The strategic configuration of automatic indexing will allow the definition of values for the following search parameters:

- target time period during which imported target records were updated;
- geographical area of residence of target voters;
- type of changes required (reaching adulthood, waiver of citizenship, suspension of voting rights, death, change of the place of residence, change of identity document, change of identity).

5. Log files.

These files are information objects designed for IT audit and implementation of the information security policy. The log files will store all access data of the *Module of data import from the State Registry of Population* and its use (start, end, import objectives, errors, etc.). The log files will be the base of the mechanism of extraction of statistics of IT solution.

4.2. Information Flows and Operation Levels

To ensure the functionality of the *Module of data import from the State Registry of Population* 2 primary categories of information flows available to different categories of users of the IT system shall be implemented.

The following information flows shall be implemented:

- **Functionality of massive data import from the State Registry of Population.** A mode of data import from the *State registry of Population* by a general search criterion that returns several records per query (search by geographic area, time period; type of change required, etc.). Thus, depending on the configuration defined the *Module of data import from the State Registry of Population* will query the *SRP*.
- **Functionality of person search in the SRP.** A mode of extraction from the *SRP* of data about a specific person. Thus, depending on the defined request (code IDNP, identity document, etc.) the *Module of data import from the State Registry of Population* will query the *SRP* and will return the data of the searched person.

4.3. Functionalities of the IT System

All the functionalities delivered by the *Module of data import from the State Registry of Population* and players who benefit from them, are shown in Figure 4.2. It should be noted that the objective of this document is only the implementation of the use case shown in the appropriate box of the chart. Other functionalities would be welcome to be implemented through system mechanisms of the *CEC* server.

In accordance with the scheme described in Figure 4.2., the players of the *Module of data import from the State Registry of Population* have access to the following functionalities:

- **UC01. Manual data import.** A use case out of scope of implementation of these TOR that contains all the functionalities of manual launch of import of data from the State Registry of Population. The manual mode is useful for cases when the current update of the database and the use of another strategy for data retrieval and import data from *SRP* than that configured in automated import are wanted.
- **UC02. Configuration of the import mode.** A functionality out of scope of implementation of these TOR available to *Authorized Users of the Module of data import from the SRP* used to configure the data retrieval strategy in the *State Registry of Population* (query for data retrieval: sought geographical area, period when changes in the *SRP* were made, category of recovered data, etc.). The import tasks (configurations) could be files of standardized format made with external functionalities of the *Module of data import from the SRP* saved in a dedicated directory to be undertaken by the *Module of data import from the SRP*.

- **UC03. Trigger of manual import.** A functionality out of scope of implementation of these TOR available to *Authorized Users of the Module of data import from the SRP* through which they trigger manually the data import from the *State Registry of Population*.
- **UC04. View of the import result.** A functionality out of scope of implementation of these TOR available to *Authorized Users of the Module of data import from the SRP* used to view the results of data import from the *State Registry of Population*. It will be provided through an external mechanism allowing viewing the database content (possibly the interface supplied by the DBMS or the *SRV* user interface).

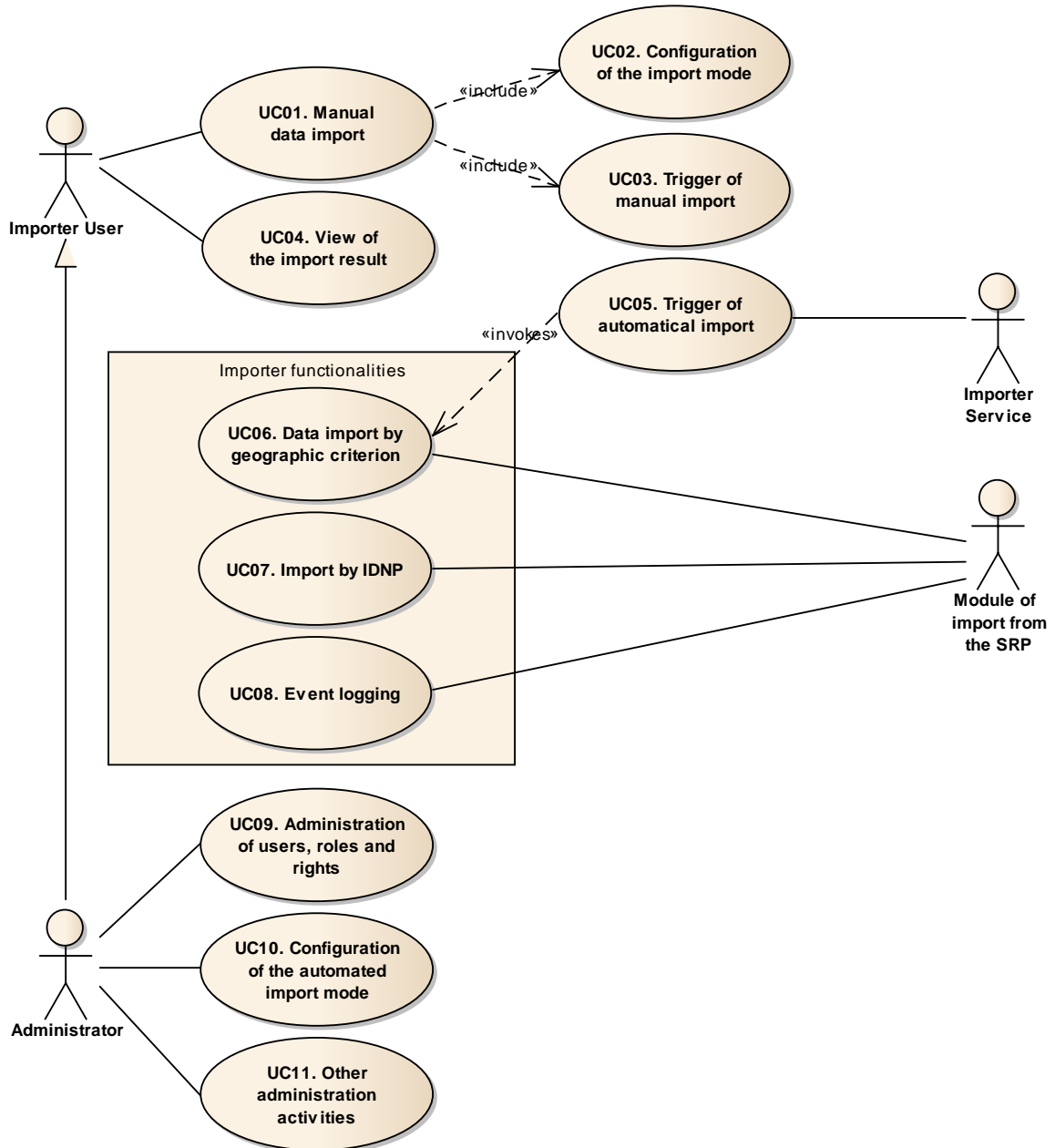


Figure 4.2. Functionalities accessible to the main players of the IT system.

- **UC05. Automatically start the import.** A functionality out of scope of implementation of these TOR available to Authorized Users via Operating System features in order to periodically start the import process from SRP.
- **UC06. Data import by geographic criterion.** A use case available to the *Module of data import from the State Registry of Population*, which offers all the functionalities necessary for the query of the *SRP* WEB service (based on the geographic area searched, time period, category of data

searched or type of change made in the period of time required), extraction and processing of data supplied by it and storage of the processing results in the technology database of the *State Registry of Voters*. The feature of this mode is the simultaneous extraction of data of many people meeting the *SRP* search criteria.

- **UC07. Import by IDNP.** A use case available to the *Module of data import from the State Registry of Population*, which offers all the functionalities necessary for the query of the *SRP* WEB service by the IDNP code, extracting and processing of data on the searched person and storage of the processing results in a technology database. The feature of this mode is the extraction of data of a single person meeting the *SRP* search criteria. In the future this functionality could be accessed by other IT systems of the *CEC* (example: to check whether there is any valid combination of Name+Last Name+IDNP + voting right in the *SRP*).
- **UC08. Event logging.** Any event generated within the functionalities implemented in the *Module of data import from the State Registry of Population* (user accessing the module, time of process execution, indexing target, result of activity, received errors, etc.) will be logged and saved in proper tables of the Database.
- **UC09. Administration of users, roles and rights.** A functionality out of scope of implementation of these TOR designed for the Administrator of the *Module of data import from the State Registry of Population* through which they manage the list and the integrity of the credentials of the IT system authorized players.
- **UC10. Configuration of the automated import mode.** A set of functionalities out of scope of implementation of these TOR designed for the Administrator of the *Module of data import from the State Registry of Population* through which they define the rules of automatic data import from the *State Register of Population* (query intended for data retrieval: sought geographical area, period when changes in the *SRP* were made, category of recovered data, etc.).
- **UC11. Other administration activities.** A set of functionalities out of scope of implementation of these TOR designed for the Administrator of the *Module of data import from the State Registry of Population* that comprises all operations of administration and provision of functionality of the *Module of data import from the State Registry of Population* that were not described in other cases of use in Figure 3.2.

4.4. Generic Flow of Data Import from the SRP

As shown in Figure 4.3, the *Module of data import from the SRV* may be started by a service installed in the operating system (or manually by the Administrator). The *Module of data import from the SRV* will undertake the task of import, will make up on its basis a query for the WEB service of the *State Registry of Population*. Once started, the *Module of data import from the SRV* will examine whether there are tasks to index information from the *SRP* and will log the event of start and task undertaking.

Once queried, the *SRP* will process the request formulated by the *Module of data import from the State Registry of Population* and will return the search results.

The *Module of data import from the SRP* will receive all the records sent by the *SRP* by saving them in a technology database to be further processed by other IT applications of the *CEC*. Additionally all events of the import will be logged and the imported data will be saved.

After completing the execution of the task, the import module will check whether there are tasks to be performed. If this is the case, it will perform the next task processing it according to the same algorithm. In case of completion of work (inexistence of unprocessed tasks) the program will automatically close.

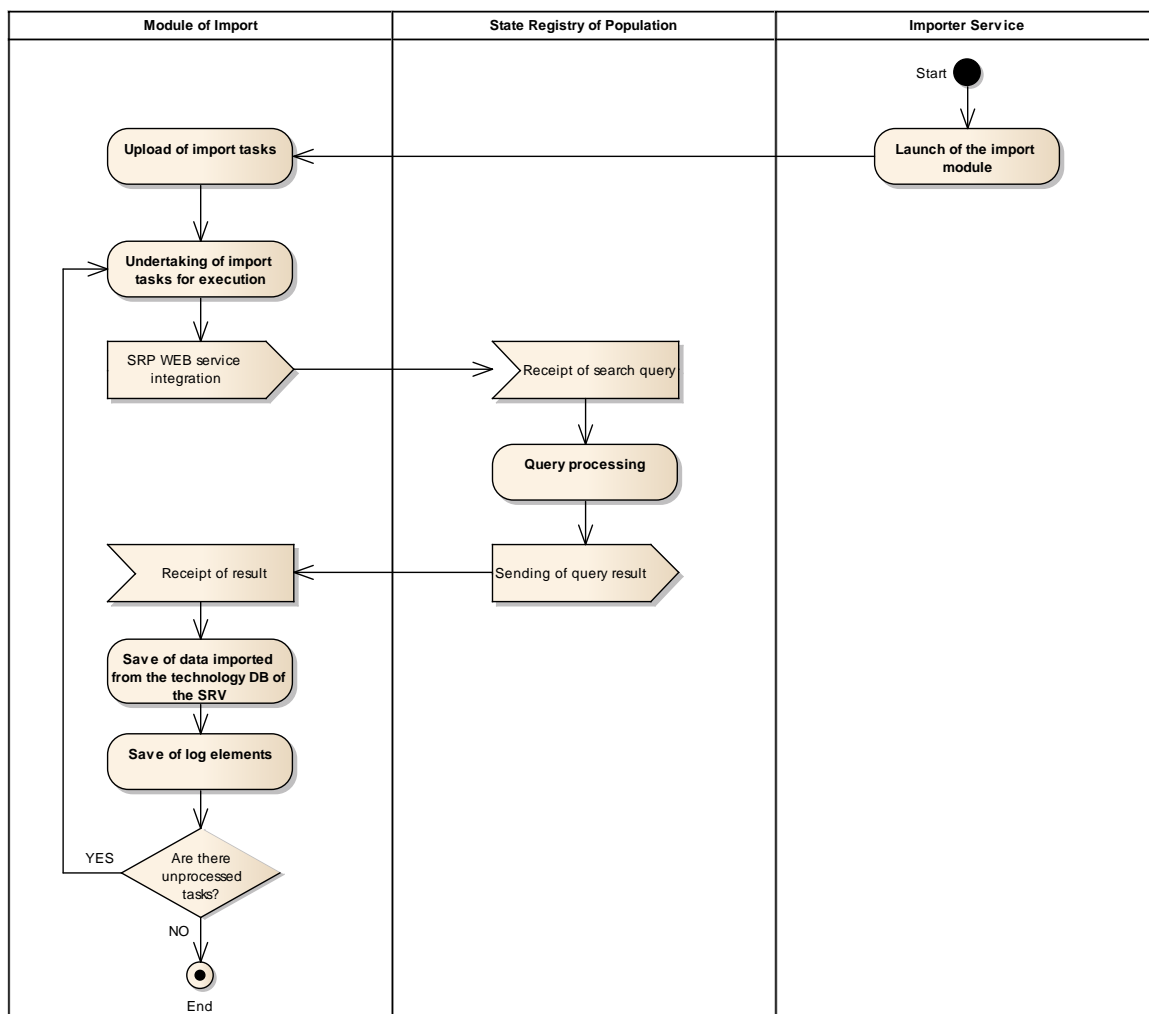


Figure 4.3. Generic Flow of Data Import from the SRP.

4.5. User Interface of the IT System

This document does not impose any specific restrictions or requirements on the user interface for the management and monitoring of the *Module of data import from the SRP*. All of the monitoring and administration processes of the module operation could be performed using the operating system mechanisms or external applications installed on the server where the software will run.

4.6. Reporting, Audit and Statistics Mechanism

The development of a functionality of report and statistics generation is not an objective of developing and implementing the *Module of data import from the State Registry of Population*. All reports / statistics of performance and monitoring of the program activities will be drawn up with external applications based on logs generated by the functionality of logging of the *Module of data import from the State Registry of Population*.

5. IT System Requirements

5.1. Functional Requirements of the IT System

5.1.1. UC06: Data import by geographic criterion.

- FR06.01. The system will allow the configuration of import tasks by geographic criteria and other criteria using the operating system resources.

- FR06.02. The system shall be able to accept files with import tasks (import strategies configurations) for execution to start the import procedure.
- FR06.03. The system will have a procedure that will query the WEB service of the *State Registry of Population* to request and receive all the records relating to individuals who meet certain search criteria such as:
- relevant geographical area of important persons;
 - calendar period considered (during which the SRP incurred changes);
 - type of sought updates (reaching adulthood, death, renunciation to citizenship, change of domicile, change of identity, change of identity document, etc.).
- FR 06.05. The system will allow regular partial updates (according to strictly defined update principles) planned on the basis of some rules defined for the *Importer Service* that will be responsible for triggering automatic regular import data for the *RSV* updates.
- FR06.06. In case of inexistence of an appropriate WEB service for the *SRP* query as required by FR 06.03 the developer will execute the works of conceptualization, development and implementation of this service.
- FR06.07. The import procedure will store all the data received from the *SRP* in a technology database.
- FR06.08. The system will store data in technology database using the *SRP* nomenclatures and classifications.
- FR06.09. The system will log all events relating to the import process (errors, statistics, important events, etc.).

5.1.2. UC07: Import by IDNP.

- FR07.01. The system will allow the configuration of import tasks from the *State Registry of Population* of a person data by their identification code using the operating system resources.
- FR07.02. The system shall be able to accept files with import tasks (import strategies configurations) for execution to start the import procedure.
- FR07.03. The system will have a procedure to query the WEB service of the *SRP* to request and receive data of a person by their identification code.
- FR07.04. The import procedure by IDNP will store all the data received from the *SRP* based on the *RSV* technology database.
- FR07.05. The system will store the data in the technology database of the *SRV* using the *SRP* nomenclatures and classifications.
- FR07.06. The system will log all events relating to the import process of a person by IDNP (errors, statistics, important events, etc.).

5.1.3. UC08: Event logging.

- FR06.01. The system will log all events related to the use of the *Module of data import from the State Registry of Population* based on a solution widely used in industry.
- FR06.02. Only the Administrator will have access to the system logs.

5.2. Non-Functional IT System Requirements

5.2.1. General System Requirements

The general system requirements are defined by policies and strategies developed and adopted in the Republic of Moldova. It is also important to note that these documents are based on the best practices in the industry and include many organizational measures and a series of technical measures.

The general system requirements specific to the *Module of data import from the State Registry of Population* include:

- SYS001 Used Database Management System MS SQL Server 2008;
- SYS002 Annually over 3 million records will be imported;
- SYS003 To provide a high degree of flexibility and portability, the IT system will consider the use of open, non-proprietary standards of the IT industry specific to WEB applications (example: XML, XSL, XHTML, WSDL, SOAP, REST, etc.).

5.2.2. Security and Protection Requirements

The system must comply with the technical requirements to IT systems imposed by the *Standard of the Republic of Moldova SMV ISO / IEC 27002:2009 Information Technology. Security Techniques. Code of good practice for information security management*.

At the time of acceptance the following will be checked:

- SR001 The IT system ensures complete storage and integrity of all records imported from the SRP.
- SR002 The access to the IT system is ensured by means of facilities of the operating system.
- SR003 The data exchange in the system is carried out only on secured channels.
- SR004 The user or system actions are recorded in electronic logs.
- SR005 The system issues a regular sign indicating its functional state.

5.2.3. Software, Hardware and Communication Channels Requirements

- SHC01 The system is accessed via communication channels with a capacity of at least 128kbps.
- SHC02 The system is able to be virtualized at hardware-software level.
- SHC03 The demonstration of the ability of virtualization by delivering to the Beneficiary a system image that can be uploaded and functional with minimum configurations on one of the virtualization solutions on the market is required. Currently the Microsoft - Hyper-V solution is used in the CEC as a virtualization mechanism.
- SHC04 It is welcome for the server solution bidder not to limit the use by the beneficiary of some specific software platforms. It is welcome for the IT system to be functional on *Windows* and *Unix (Linux, Free BSD, Solaris, etc.)* platforms. It would be good for the IT solution to be made up by using the open, non-proprietary solutions specific to Web applications (XML, XSL, XHTML, WSDL, SOAP, LDAP, J2EE, etc.) for the Beneficiary to be able to develop it later.
- SHC05 The current software architecture of the CEC is: Windows 2003 Server, MS SQL Server 2008, IIS 7, ASP .NET, TFS, Microsoft - Hyper-V, Microsoft Visual Studio 2010.

5.2.4. IT System Documentation Requirements

The IT solution will be accompanied by a complete set of documentation of the IT system, which includes the following components:

- DOC01 The **Technical Project** of the delivered information system on which basis all activities of (SRS and SDD) development / acceptance will be carried out.

- DOC02 The **Architecture Documentation** of the system describing the models in the UML language that would include a sufficient level of detailing of the architecture and in several sections.
- DOC03 The **API Documentation** subject to the integration with other information systems.
- DOC04 The **technical project updated and completed** during the development of the information system.
- DOC05 The **Administrator Manual** describes the functions of administration, including functions directly exposed from the system and manual procedures required to maintain the maintenance and proper operation of the service.
- DOC06 The **automated interoperation interfaces with external systems** of the IT system are (technically) specified and documented (in human text).

6. Final Products and Delivered Components

The final product is composed of software artefacts, as well as of artefacts of system documentation and knowledge transfer to the holder and the system administrator.

The system's artefacts include:

- Complete source code of the modules and components necessary for the compilation of the delivered software product;
- Final product packaged for easy installation in the proposed technological environment;
- Technical project updated and completed during the development;
- Document on the system installation and configuration;
- Administrator Manual (including the contingency plan);
- Technical specifications in the WSDL language for published service interfaces;
- Source code for the applications and components developed within the project.
- Libraries and special tools required for the compilation of the system components (the developer will demonstrate the possibility of compiling the source code on the platform provided by the CEC).
- The test plan and the results of the internal (functional, performance, security) tests;
- All of the artefacts copied to removable carriers (CD-R or DVD-R).

The knowledge transfer and support include artefacts and services:

- Training materials;
- Training for users and administrators;
- Assistance during the system piloting period;
- Assistance in the system acceptance test;
- Assistance in putting the system into production;
- Removal of deficiencies identified during the pilot period and upon the acceptance test.

After putting the system into production the following is necessary:

- Post implementation technical support for a period of 24 months, including corrective, adaptive and preventive maintenance in accordance with the ISO / IEC 14764.

7. IT System Implementation Phases

The design, development, test and implementation of all the compartments of the *Module of data import from the State Registry of Population* must be performed by specialized companies and entities that have relevant expertise and the licenses necessary to carry out the relevant works and shall include the following phases:

1. **Phase of the IT subsystem development** - which will be divided into phases coordinated with the parties involved (*Central Election Commission, UNDP*) in the development of the *Module of data import from the State Registry of Population*:
 - a. The developer based on the Terms of Reference determines and analyzes the requirements, designs the structure of the IT system and develops the Technical Project (*document containing detailed information on solution architecture, conceptual and physical model of data, all IT system components and interaction between them, the need of hardware and software resources for operation, principles of development of the administrator and user interface, features of implemented legislative rules, users and roles, all standard types of documents implemented, principles of information security, etc.*). The duration of the phase will not exceed 3 weeks.
 - b. The developer develops the software code of the IT system and integrates its modules into a prototype version of the IT system (an initial presentation to the parties will be made proving the existence of all required functionalities in terms of reference and documented in the *Technical Project*). The duration of the phase will not exceed 2 months.
 - c. The developer tests the subsystem in laboratory mode (internal testing) and prepares the accompanying documentation (the system's functionalities with corrections and adjustments to the objections made in the previous sub-phase, the set of technical documentation are submitted, etc.). The phase will not last more than 1 month.
2. **The module implementation phase** will begin upon the approval of the minutes of acceptance by the owner of the software system in the submitted variant and the signing of the statement of acceptance in experimental operation. At this phase the developer tests the system in experimental conditions, detects and removes performance errors, etc. At this phase the developer prepares the final version of the IT system to be commissioned. The phase will last at least 1 month.
3. **The training phase** will start with the implementation of the IT solution and will include the training of 2 users from the IT subdivision of the *Central Election Commission*. The phase will last 1 week.
4. **The commissioning of the system** begins with the signing of the statement of commissioning of the software system and start of use.
5. **The system maintenance phase** is the period where the system developer assumes the commitment to the owner to assist them in maintaining or changing the software product, maintaining its integrity. This phase may be long depending on the contractual agreements. In case of the *Module of data import from the SRP* we consider that the initial period of 24 months would be sufficient.

8. Requirements on Completion of Bids

8.1. Requirements on the Institutional Power of Bidders

Eligible to bid are companies specialized in the provision of IT services with minimum 5 years of experience, able to provide maintenance services for 24 months. The experience in the development of IT applications for electoral processes and interaction with the *SE "CRIS Registru"* would be an advantage.

The legal entities interested shall send their technical and price bid containing:

- Detailed description of the enterprise (experience, human resources, managerial and technical skills in the field, etc.;

- Copy of the registration documents;
- Company's portfolio specifying similar implemented projects;
- References of beneficiaries of the company over the last 4 years
- CVs of key staff involved in the project;
- Brief description of the similar IT solutions;
- Detailed proposed technical solution, including restrictions on hardware operation, assessment of activities and their duration.
- Warranty period and technical assistance;
- Detailed financial offer;
- Other relevant documents.

8.2. Requirements to the Qualification of the Bidder's Staff

All discussions with the beneficiaries of the project will be conducted in Romanian. All the relevant documentation, information solution interface and training and technical support will be conducted in Romanian. All staff involved in the project that will interact directly with the beneficiary must perfectly speak Romanian.

The bidder shall submit the technical bid with summary data on the project staff and its qualifications. Explicitly persons holding the following key positions shall be presented:

- Project Manager;
- Technical Coordinator;
- System Architect;
- Business Analyst;

For these positions CVs of trained persons shall be submitted, given that the proposed team must prove the following skills:

- Licensed in ICT;
- Minimum 5 years of experience in the proposed position;
- Specific experience in ICT proved through the implementation of similar projects like principles of operation or area of interest;
- Knowledge of modern methodologies for design and development of IT solutions;
- Sufficient knowledge of IT system development methodology for the government sector of the Republic of Moldova;
- Certification of the proposed technologies would be an advantage;
- Perfect knowledge of Romanian language (English language would be an advantage).