

TERMS OF REFERENCE

Intended for the Development of SAISE IT Subsystem
“Register of Electoral Officials”

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Introduction

The Electoral Code of the Republic of Moldova contains explicit requirements on the need to develop an IT component intended for managing a data stock, which would comprise exhaustive information on electoral officials (Article 1. General Concepts/Terms: *Register of Electoral Officials – a system of registration (personal database) at the national level of electoral officials, drawn up by the Central Electoral Commission, which includes information on the officials' Surname and First Name, year of birth, profession (occupation), job position, employer, contact phone number, domicile, the body/person who appointed them, and when they participate in elections, the date of elections shall be stated, as well as their position held within the electoral bodies*).

Under these considerations, *the REO* shall implement/computerise the business processes aimed at managing the data on electoral officials, which operation would enable:

- Strengthening a comprehensive stock with all electoral officials' **data**;
- Keeping records on electoral officials' **identity and contact data**;
- Keeping records on engaging the electoral officials in election processes;
- Keeping records on electoral officials' **training processes**;
- Updating automatically the data related to electoral officials;
- Deploying quickly the electoral infrastructure under new elections;
- Generating analytical and performance reports for decision-making;
- Other relevant actions.

The implementation of *the Register of Electoral Officials* shall support the current regulatory framework (the *Electoral Code of the Republic of Moldova* adopted by Law No. 1381 dated 21.11.1997 and *Central Electoral Commission Decision No. 22* dated 05.04.2011 approving the *Regulation on the Register of Electoral Officials*) with an advanced computerised toolbox in line with the latest trends for implementing e-Governance solutions.

The REO operation shall increase the accuracy of data held by the Central Electoral Commission and enhance the quality of electoral processes resulting from the implementation of performance assessment mechanisms and continuous education of electoral officials.

This document, intended for developing and implementing *the Register of Electoral Officials*, shall delimit the IT solution goals, tasks and functions, the organisational structure and regulatory and legal constraints, as well as the functional and non-functional requirements needed for the development and operation of the IT System.

The prepared Scope of Work (SoW) is stemming from the information technologies and national policy related to IT solutions envisaged to underpin the activity carried out by the Moldovan public authorities.

1. General Information

The REO represents an IT solution identified to produce benefits and immediate impact on the activity of the Central Electoral Commission. It is an IT solution aimed at ensuring the IT and information needs of the actors engaged in SAISE operation.

The REO is a component of the State Automated Information System "Elections" (SAISE), representing a decoupled module from the programmatic perspective, but which implements key functionalities for preparing the electoral infrastructure and is to provide the data required to ensure smooth operation of other SAISE components.

1.1. Terms used in the Scope of Work

All the acronyms and abbreviations used in this Document are specified in Table 1.1.

Table 1.1. Abbreviations and acronyms used in the Document.

No.	Abbreviation/Acronym	Description
1.	API	Application Programming Interface
2.	PSA	Public Services Agency
3.	DB	Database
4.	CEC	Central Electoral Commission
5.	DEC	District Electoral Council
6.	CICDE	Centre for Continuous Electoral Training
7.	EMD	Elections Management Division under the CEC
8.	KPI	Key Performance Indicators
9.	REO	IT Subsystem "Register of Electoral Officials"
10.	SRLE	State Register of Legal Entities
11.	SDD	Software Design Document
12.	DBMS	Database Management System
13.	ITS	IT System
14.	SAISE	State Automated Information System "Elections"
15.	SRS	Software Requirements Specification
16.	SLA	Service Level Agreement
17.	ITSS	IT Subsystem
18.	IT	Information Technology
19.	ICT	Information and Communication Technology
20.	TLS/SSL	The TSL Protocol or its predecessor, the SSL Protocol, are cryptographic protocols that ensure safe communication between two hubs of computers network for such actions as visiting Web pages, e-mail, Internet-fax, exchange of instant messages and other transfers of data.

Table 1.2 displays the definitions and explains the concepts/terms frequently used in this Document.

Table 1.2. Definitions and concepts/terms used in this Document.

No.	Abbreviation/Acronym	Description
1.	Database	Set of data organised according to the conceptual structure that describes the basic features and the relationship between entities.
2.	Credentials	Set of attributes that define the identity and authenticity of Users and systems within the information systems.
3.	Data	Elementary information units about people, issues, facts, events, phenomena, processes, objects, situations, etc. presented in a form that allows notification, commenting and their processing.
4.	Personal data	Any information related to an identified or identifiable individual (subject of personal data). In this respect an identifiable person is one who can be identified, directly or indirectly, in particular, by reference to an identification number or to one or more specific elements related to his/her physical, physiological, mental, economic, cultural or social features.
5.	Electoral official	An individual who acted as a member of the District Electoral Council or of the Polling Station Precinct Electoral Bureau, as well as in the working apparatuses of District Electoral Councils.
6.	Data integrity	Data status when they maintain their content and are interpreted unambiguously in cases of random actions. The integrity is deemed preserved unless the data have been altered or damaged (deleted).
7.	Logging	Function of recording the information about events. In the information systems, the records about the events include details about the date and time, User, undertaken action.
8.	Metadata	The way of assigning semantic value to the data stored in the database (data about data).
9.	Information object	Virtual representation of existing tangible and non-tangible entities.
10.	Information resource	A range of documented information within the IT system maintained in compliance with the requirements and legislation in force.
11.	REO	IT Subsystem intended to keep records on officials at the national level, out of which <i>the Central Electoral Commission</i> can select candidates to be nominated as members of inferior electoral bodies.
12.	IT System	Set of software and equipment that shall ensure automatic data processing (automatic information system component).
13.	Information system	System for information processing along with the related organisational resources, such as human and technical resources, which furnish and disseminate the information.
14.	Software design document	IT System guiding document comprising detailed description of the following approaches: data structures and their constraints, IT System architecture, which provides all conceptual sections of the IT System, IT System interface covering the conceptualisation of all User Interface components, IT System functionalities comprising detailed description of all IT System implementation scenarios.
15.	Software Requirements Specification	A document containing detailed description of all interaction scenarios between Users and the IT Application.
16.	IT Subsystem	A component (with the possibility of functional decoupling) of a complex IT system.
17.	Information and Communication Technology	Common term that includes all technologies used for information exchange and processing.
18.	Reliability of data	The extent to which the data stored in the computer memory or in documents correspond to the real status of the field-related objects mirrored in those data.

1.2. References and Legal Aspects for IT Subsystem Development

The processes concerning the creation, implementation and operation of REO shall not contravene the relevant regulatory acts in force regarding the CEC activity and the development of IT solutions intended for Moldovan public authorities.

This category comprises, *inter alia*, the following regulatory acts:

1. *Electoral Code of the Republic of Moldova*, adopted by Law No. 1381 of 21.11.1997, Official Gazette No. 81 dated 08.12.1997.
2. *Law No. 101 of 15.05.2008 on the Concept of the State Automated Information System "Elections"*, Official Gazette No. 117-119 of 04.07.2008.
3. *CEC Decision No. 22 of 05.04.2011 approving the Regulation on the Register of Electoral Officials*, Official Gazette No. 65-68 dated 22.04.2011.
4. *Law No. 133 of 08.07.2011 on Personal Data Protection*, Official Gazette No. 171-175 dated 14.10.2011.
5. *Government Decision No. 1123 of 14.12.2010 approving the Requirements for ensuring personal data security during their computerised processing*, Official Gazette No. 254-256 dated 24.12.2010.
6. *Government Decision No. 7104 of 20.09.2011 approving the Strategic Programme for governance technological upgrade (e-Transformation)*, Official Gazette No. 156-159 dated 23.09.2011.
7. *Government Decision No. 128 of 20.02.2014 on the shared Government Technological Platform (MCloud)*, Official Gazette No. 47-48 dated 25.02.2014.
8. *Government Decision No. 656 of 05.09.2012 approving the Interoperability Framework Programme*, Official Gazette No. 186-189 dated 07.09.2012.
9. *Government Decision No. 1090 of 31.12.2013 on Government Electronic Service of access authentication and control (MPass)*, Official Gazette No. 4-8 dated 10.01.2014.
10. *Government Decision No. 405 of 02.06.2014 on Integrated Government Electronic Service Digital Signature (MSign)*, Official Gazette No. 147-151 of 06.06.2014.
11. *Government Decision No. 708 of 28.08.2014 on Government Electronic Service of Logging (MLog)*, Official Gazette No. 261-267 dated 05.09.2014.
12. *Law No. 91 of 29.05.2014 on Electronic Signature and Electronic Document*, Official Gazette No. 174-177 dated 04.07.2014.
13. *Government Decision No. 945 of 05.09.2005 on Centres for Certification of Public Keys*, Official Gazette No. 123-125 dated 16.09.2005.
14. *Government Decision No. 320 of 28.03.2006 approving the Regulation on the way of affixing the digital signature on electronic documents of public authorities*, Official Gazette No. 51-54 dated 31.03.2006.
15. *Law No. 467-XV of 21.11.2003 on Computerisation and State Information Resources*, Official Gazette No. 6-12/44 dated 01.01.2004.
16. *Written Order No. 94 of 17.09.2009 issued by the Ministry of Information Development approving some Technical Regulations (keeping records on public electronic services, providing public electronic services, ensuring the information security when providing public electronic services, calculating the cost of development and implementation of automatic information systems)*, Official Gazette No. 58-60 dated 23.04.2010.
17. *Technical Regulation "Software life cycle processes" RT 38370656-002:2006*; Official Gazette No. 95-97/335 dated 23/06/2006.
18. Other enacted laws, regulatory acts, standards in the ICT area.

The principles comprised by the international guidelines and recommendations listed below should be implemented in order to define the REO concept and ensure its development:

- *Standard of the Republic of Moldova SM ISO/CEI/IEEE 15288:2015, "Systems and Software Engineering. System life cycle processes".*
- HHS Web Standards and Usability Guidelines, <https://guidelines.usability.gov/>
- Michael O. Leavitt, Ben Shneiderman, *Research-Based Web Design & Usability Guidelines*, U.S. Government Printing Office, https://www.usability.gov/sites/default/files/documents/guidelines_book.pdf
- *Recommendations of the World Wide Web Consortium (W3C) (<http://www.w3c.org>) on the quality of web page content, possibilities to view the information correctly by the commonly used Internet browsers and compatibility with different IT platforms;*
- *Recommendation of the (<http://validator.w3.org>) on website testing. All pages generated by SAISE Admin shall be tested as per these recommendations.*

1.3. IT System Core Principles

In order to ensure the attainment of the objectives outlined for the IT solution, in the process of its designing, developing and implementing full account shall be taken of the following general principles:

- Principle of Legality: implies the establishment and operation of IT Systems in compliance with the national legislation in force and with the recognised relevant international rules and standards;
- Principle of split-level architecture: involves independent design of SAISE components (*REO* is a SAISE component) in compliance with the interface standards among levels;
- Principle of service-oriented architecture (SOA): involves dividing the application functionality into smaller and distinct units – called services – that can be assigned into a network and can be used together to create applications intended for the implementation of IT System business functions.
- Principle of reliable data: stipulates that data shall be entered into the system through authorised and authenticated channels only;
- Principle of information security: implies ensuring an adequate level of integrity, selectivity, accessibility and efficiency to protect the data against losses, alteration, deterioration and unauthorised access.
- Principle of transparency: implies designing and implementing as per the modular principle, having used transparent standards in the area of IT and telecommunications;
- Principle of expansibility: stipulates the possibility to expand and supplement the IT System with new functions or improve the existing ones;
- Principle of first person/single centre priority: implies the appointment of a high-rank responsible person who has been empowered with sufficient rights to take decisions and coordinate the activities aimed at IT System establishment and operation;
- Principle of scalability: implies ensuring constant IT performance in case of increased volume of data and IT System load;
- Principle of usage simplicity and complacency: implies the design and implementation of all applications, technical and programme means accessible for System Users, based exclusively on visual, ergonomic and logical concept principles.

In particular, the IT System Architecture shall comply with the following essential principles:

- implementing a WEB based client-server solution with authorised access to the interface and data;
- ensuring adequate security for the IT System to protect the information and subsystem components against their illegal use or disclosure of personal data or of limited access information;
- recognising information as an asset and ensuring its proper management;

- developing and implementing IT Systems that enable their use for other processes or ensure opportunities to develop new functionalities (including the acquisition of functionalities already existing in the *SAISE*);
- minimising the number of various technologies and products that offer the same or similar functionalities as per their purpose (reuse of technologies already implemented within the CEC);
- ensuring recovery capacities following disasters (ensuring physical and logical security) as a component of the implementation plan.

1.4. IT System Purpose, Objectives and Tasks

The REO main purpose is to automate the electoral infrastructure preparation processes by having computerised the record keeping and data management on electoral officials engaged in election processes (to be selected for appointment to district electoral councils and precinct electoral bureaus of polling stations, including those located abroad).

This should enable the implementation of a data stock, which would provide relevant information on potential persons to be engaged in elections, their number, level of preparedness and experience, geographical area of activity, other information contributing to the adoption of optimal administrative decisions.

The REO implementation shall enable *the CEC* to keep active electoral officials capable to perform electoral functions of due quality. Its development and implementation shall enable the *CEC* to attain the following objectives:

- strengthening an up-to-date collection of data on electoral officials;
- automating the process of data collection on electoral officials;
- automating the processes of identification and allocation of electoral officials during elections;
- providing tools to analyse the data on electoral officials for the purpose of keeping records on their continuous education and planning instructive activities;
- keeping records on training certificates issued to electoral officials;
- developing an efficient co-operation mechanism amongst the actors engaged in recording or managing *actions* related to electoral officials;
- ensuring data access control, as well as security and maximum confidentiality of data collections and Users;
- providing information for analysis, forecasting and relevant research activities.

2. IT System Architecture

The REO shall provide a WEB interface that is accessible through a widely-used Internet browser (*MS Internet Explorer/MS Edge, Mozilla FireFox, Opera, Google Chrome or Safari*). From the functional standpoint, it is envisaged to develop a reliable and scalable solution for the increased number of concurrent Users and for the increased volume of information managed by it.

As REO is not an isolated IT solution, and it would interact with other CEC IT Subsystems or with external IT solutions, the developed application shall offer the support necessary to integrate with other IT Subsystems.

REO relies on at least three-level client-server architecture (that excludes direct interaction of the application with the DB) based on the state-of-the-art WEB technologies.

In order to ensure an adequate information security level, the delivered application shall enable the implementation of secured connections amongst client stations and application server to grant safe information transfer (via VPN channels and TLS/SSL sessions).

The IT solution shall be developed on the basis of the-state-of-the-art Internet/Intranet technologies. The interaction of all Information Subsystem actors and hubs is displayed in Figure 2.1.

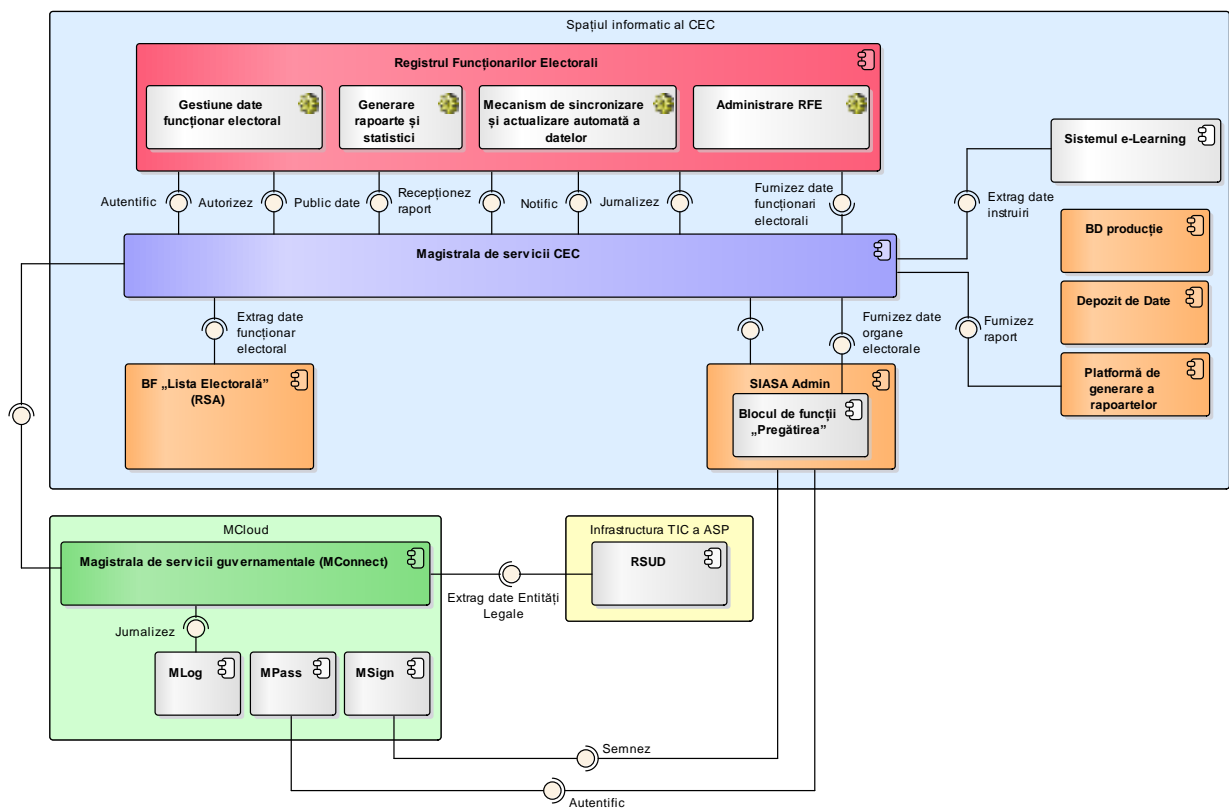


Figure 2.1. REO Architecture.

As shown in Figure 2.1, the solution of pooling the resources aimed to ensure REO functionalities comprises three categories of distinct hubs:

- CEC Data Centre – the CEC ICT infrastructure that will host the REO and where there is a number of information systems installed the REO would interact with. Those functionalities that fall within the red dashed-line perimeter shall be implemented under the current SoW;
- M-Cloud – governmental shared ICT infrastructure operating on the basis of “cloud computing” technology (*M-Cloud*), hosting a series of IT systems with which REO should interact or which services would be used by the REO. It is worth mentioning that a number of MCloud platform services are implemented through SAISE Admin and will be reused by REO (*M-Pass* as a User authentication mechanism through electronic or mobile signature, *M-Sign* – for affixing electronic

or mobile signature on the prepared documents (electronic forms) and *M-Log* – for logging the critical business events.

- Client Computers – computers from where the Users (depending on their rights and roles) shall be granted access to *REO* functionalities.

In order to have access to and use the *REO*, client computers shall use as client applications at least two of the most popular Internet web browsers (compatibility with *Microsoft Internet Explorer/ Microsoft Edge* is binding). The interface and functionalities assigned to each individual User will **depend on the User's level, rights and roles**.

Regardless of the User's access level, all connections of Users with the *REO* shall be carried out via safe means (VPN or TLS/SSL).

In order to implement a number of functionalities, the *REO* shall use, through the CEC Interoperability Framework, a number of services delivered by the *SAISE ITSS*, namely:

1. WEB Service Authenticate provided by *SAISE Admin* to implement a universal and centralised mechanism for *SAISE* Users' **authentication**.
2. WEB Service Authorise provided by *SAISE Admin* to implement a universal and centralised mechanism for Users' **authorisation** (the provision of functionalities and data accessible to them), regardless of the used *SAISE* application.
3. WEB Service Notify provided by *SAISE Admin* to implement a universal and centralised mechanism for *SAISE* Users' **notification, regardless of the used SAISE** application.
4. WEB Service Logging provided by *SAISE Admin* to implement a universal and centralised mechanism for logging the **actions generated by the authorised Users' activity under the used SAISE** applications.
5. WEB Service Retrieve Data on Electoral Officials provided by *the SAISE Function Block "Electoral Roll" (State Register of Voters)* to retrieve **electoral officials'** identification and residence data.
6. WEB Service Provide Data on Electoral Bodies furnished by *the SAISE Function Block "Preparation"* to retrieve data related to all level electoral bodies recorded within *SAISE*.

The REO shall interact with a number of external IT Systems through *SAISE Admin*. To this end the following services exposed by external IT Systems will be used:

1. WEB Service Authenticate, which interacts with the Government Platform Service *MPass* used to implement the procedures for the authentication of CEC external Users through electronic or mobile signature.
2. WEB Service Sign, which interacts with the Government Platform Service *MSign* intended for affixing and validating the electronic signature, including the mobile signature.
3. WEB Service Logging, which interacts with the Government Platform Service *MLog* intended for judicial logging of *REO* sensitive actions.
4. WEB Service Retrieve Data on Legal Entities, which interacts with the State Register of Legal Entities to retrieve the identification data on legal entities related to electoral officials (state institutions, political parties, NGOs, economic operators, etc.).

In its activity, *the REO* shall expose two interfaces for the interaction with external IT Systems intended for CEC activity processes *or* for the provision of public data. To this end the following services exposed by *the REO* can be listed:

1. WEB Service Provide Data on Electoral Officials to send to other *SAISE* IT Subsystems the electoral officials' identity information and their assignment to polling stations, constituencies and to other CEC electoral infrastructure bodies.

3. Involved Parties and IT System Roles

3.1. IT System Business Roles

The following entities are interested or shall be engaged in *REO* development or operation:

- Central Electoral Commission as a permanent public authority established to implement the electoral policy and ensure sound organisation and conduct of elections. The CEC Mission is to create optimal conditions so that all Moldovan citizens can freely exercise their constitutional right to elect and be elected during free and fair ballots. The *CEC* shall be responsible for the *SAISE* administration and operation, including the IT Subsystem "*Register of Electoral Officials*";
- **UNDP Project "Enhancing Democracy in Moldova through Inclusive and Transparent Elections"** (EDMITE) as an institution that would finance and monitor *REO* development and implementation activities;
- Centre for Continuous Electoral Training (CICDE) as a public institution under the *CEC* aimed at expanding the number of people with election-related professional training and ensuring better organisation of the electoral process. As of 2013, people who attended *CICDE* training courses and hold appropriate qualification certificates are appointed as electoral officials;
- Public Services Agency as the Provider of information through *the State Register of Legal Entities* on the identity of *subjects* where the electoral officials or the *subjects* (political parties, NGOs, etc.) they represent have their main job;
- e-Government Agency as a body empowered to develop and implement the *e-Transformation* policy, *MCloud* solution and *MConnect* Interoperability Framework used to support the *REO* interaction with external IT Systems (*the State Register of Legal Entities*) and platform services (*MPass*, *MSign*, *MLog*);
- State-owned Enterprise "**IT and Cyber Security Service**" as an entity that manages the *MCloud* solution, which provides platform services implemented under *the REO* or which would ensure the intersection of *REO* with external IT Systems.

3.2. IT System Possessor

The Central Electoral Commission shall be the IT Subsystem Possessor. The role of system Possessor shall mirror the administrative aspect related to CEC full competences, which are required to ensure the IT System continuous administration and development.

As a *REO* Possessor, *the Central Electoral Commission* would be able to assign roles and rights of access to User Interface and data to its employees, depending on their job duties.

3.3. IT System Owner

The Central Electoral Commission shall be the IT Solution Owner and provide the technical infrastructure to host the *REO*.

In the long run it is not inconceivable that some *REO* components would be hosted outside the CEC data centre. A solution to this end could be the government shared platform *MCloud*. This would be possible following the appropriate certification of *MCloud* by the Information and Security Service of the Republic of Moldova.

3.4. IT System Purchaser

The REO will be purchased by the *UNDP Project "Enhancing Democracy in Moldova through Inclusive and Transparent Elections"* (EDMITE) on behalf of the Central Electoral Commission. Although the CEC is the direct Beneficiary of the IT solution, the *EDMITE Project Consultants* will be engaged in all stages of *REO* development, putting into operation and final acceptance.

3.5. Users and their Role under the IT System

Human roles or the IT systems, which interact with the *REO*, are displayed in Figure 3.1. As shown in this Figure, five categories of human actors and five categories of IT Systems would be interacting under this application.

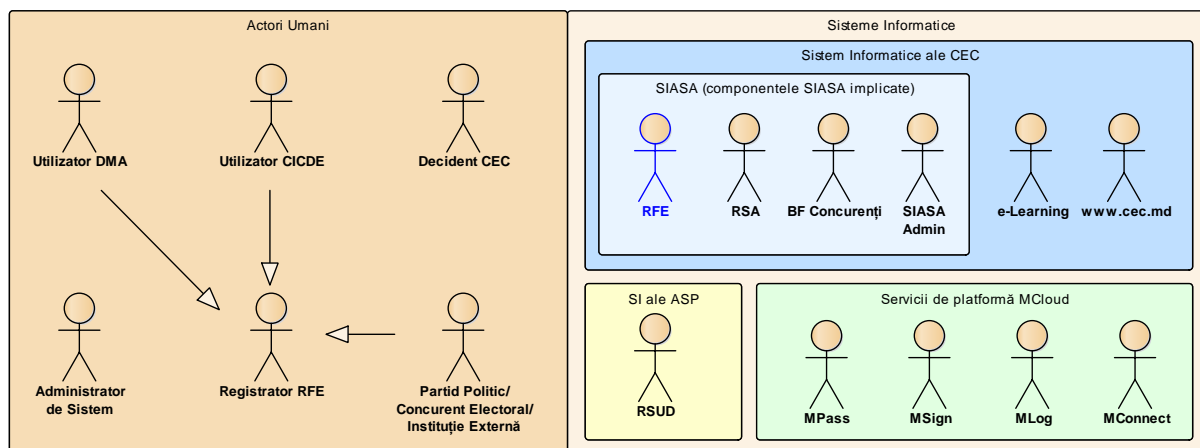


Figure 3.1. REO Actors.

1. DEC User – represents the authorised users of District Electoral Councils who prepare and send electronic forms related to actions on electoral officials. These Users shall have access to the following functionalities:
 - search and view the available data as per the associated roles and rights;
 - prepare and send the forms to add new electoral officials;
 - prepare and send the forms to update the data on the existing electoral officials;
 - prepare and send the forms to assign the electoral officials to training courses;
 - prepare and send the forms to assign the electoral officials to electoral bodies;
 - prepare and send the forms to strike off the electoral officials;
 - generate and print out the standard documents related to the prepared forms;
 - receive notifications.

2. EMD User – represents authorised users of the CEC *Elections Management Division*, who interact with *REO* to exercise their job duties. These Users shall have access to the following functionalities:
 - search and view the available data as per the associated roles and rights;
 - prepare the forms to add new electoral officials;
 - prepare the forms to update the data on the existing electoral officials;
 - prepare the forms to strike off the electoral officials;
 - prepare the forms to assign the electoral officials to training courses;
 - prepare the forms to assign the electoral officials to electoral bodies;
 - generate and print out the standard documents related to the prepared forms;
 - use the Dashboard;
 - retrieve reports and statistics related to *REO* activities;
 - receive notifications.

3. CICDE User – represents the authorised users of the CEC *Centre for Continuous Electoral Training*, who interact with *the REO* to exercise their job duties. These Users shall have access to the following functionalities:

- search and view the available data as per the associated roles and rights;
 - plan the training courses;
 - configure the training sessions;
 - entry the training results;
 - prepare the forms to add new electoral officials;
 - prepare the forms to update the data on the existing electoral officials;
 - generate and print out the standard documents related to the prepared forms;
 - use the Dashboard;
 - retrieve reports and statistics related to REO activities;
 - receive notifications.
4. CEC Decision Maker – represents authorised CEC users empowered with decision-making roles in the processes of managing the data comprised by REO. These Users shall have access to the following functionalities:
- use the Dashboard;
 - receive notifications;
 - approve/reject the electronic forms related to REO workflows;
 - retrieve reports and statistics related to REO activities.
5. Administrator – human actor empowered to ensure smooth operation of *REO* functionalities. If the technological environment where the IT System is operated comprises sufficient capabilities to carry out administration works, then their implementation in the system is optional. This category of actors shall have access to the following functionalities:
- unconditional use of IT System functionalities, except for changing the logging files;
 - manage the *REO* system nomenclatures, classifiers and metadata;
 - manage the roles and rights of *REO* authorised Users through the SAISE Admin ITSS mechanisms;
 - configure the *REO* resources, roles, transitions and workflows through the SAISE Admin ITSS mechanisms;
 - start/suspend *the REO* operation;
 - monitor the *REO* operation process;
 - ensure information security;
 - manage the database;
 - manage the interconnection interfaces with external and internal IT Systems.

REO implementation implies the interaction of the following IT Systems:

1. REO – a SAISE IT Subsystem, which implements the provisions of the Electoral Code on establishing a single register of all electoral officials, which would represent the main source of data for setting up the elections infrastructure;
2. e-Learning – CEC IT System intended for remote training of electoral officials. This system shall provide data on the trainings carried out and on performance appraisal results of electoral officials (including the data on the issued certificates).
3. SAISE – State Automated Information System “Elections” developed in compliance with Law No. 101 of 15.05.2008, which computerises the CEC elections processes. As *the REO* will reuse a large part of shared metadata of other SAISE IT Subsystems *or* resort to their services, the integration with the following SAISE IT Subsystems shall be achieved:

- SAISE Admin provides SAISE interoperability services intended for authentication, authorisation, logging and notification. Likewise, all *REO* resources will be configured through *SAISE Admin*, as well as their status and transition, workflow rules, etc.
 - State Register of Voters – IT system to keep records on Moldovan voters, intended to collect, store, update and analyse the information about the Moldovan citizens who reached the age of 18 years and are not legally limited to exercise their civil rights. *The REO* shall acquire from this IT Subsystem all the data related to **voters' profiles** – citizens of the Republic of Moldova – in order to fill in the identification data of electoral officials.
4. External Information Systems represent all external IT Systems *the REO* interacts with. The following categories of external IT Systems can be identified to this end:
- *SRLE – State Register of Legal Entities* *the REO* will interact with through the Interoperability Platform *MConnect* to acquire and entry the data of *subjects* where the electoral officials work or of entities, which recorded/nominated them as electoral officials.
 - *MCloud Platform Service* – integration with platform services of the shared Government Platform *MCloud* to implement the functionalities provided by them. The integration with the following *MCloud* platform services has been envisaged:
 - *MConnect* – interoperability platform through which interaction with IT Systems of Moldovan public authorities is provided. The Interoperability Platform *MConnect* will be used to implement the interaction with the *State Register of Legal Entities*.
 - *MPass* – a platform service used for IT System access control to ensure the authentication procedures through electronic or mobile signature.
 - *MSign* – a platform service used upon affixing and validating the electronic signature, including the mobile signature.
 - *MLog* – a platform service used to log all critical *actions* related to IT systems of Moldovan public authorities.

4. IT System Functional Model

4.1. IT System Information Objects

Following the review of the area subject to modelling (computerising the electoral officials' management process), it is possible to outline the data model to be considered while developing the REO. Figure 4.1 displays the information objects (and the relations thereof), which will lay down the foundation for REO design and developments.

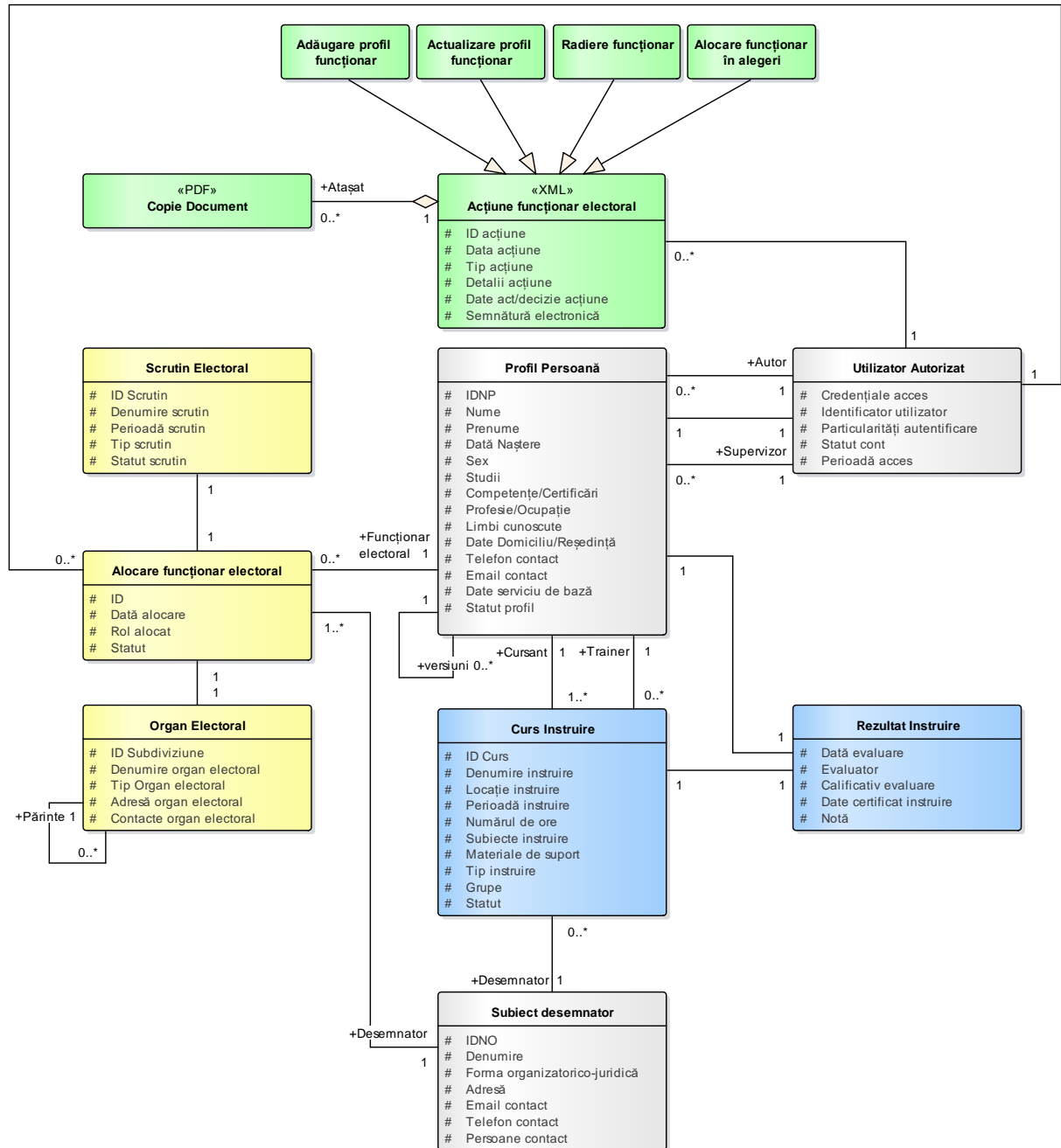


Figure 4.1. REO Data Model.

In order to ensure REO smooth operation it is necessary to implement the functionalities required to manage the following groups of information objects:

- Profile;
- Document on actions related to electoral official's profile;

- Attached document;
- Elections;
- Electoral official training.

1. Profile

A complex information object, which defines the profiles of *subjects* and individuals recorded within the *REO*. This information object presupposes there are three categories of profiles in place, namely:

- A. *Profile of an individual*. It represents the recorded data of any individual/natural person engaged in *REO* processes, regardless of the role held (electoral officials and authorised users). As a rule, the completeness level of an individual profile depends on the assigned role and contains the following data categories:
 - a) Profile Status;
 - b) IDNP;
 - c) Last Name;
 - d) First Name;
 - e) Date of Birth
 - f) Gender;
 - g) Education;
 - h) Skills/certifications;
 - i) Profession/occupation;
 - j) Language skills;
 - k) Domicile/Residence;
 - l) Data on the main job;
 - m) Phone number(s);
 - n) Email;
 - o) Other relevant data.
- B. *Profile of Authorised User*. Represents the profiles of authorised IT System Users to be engaged in *REO* business processes or who would need access to *REO* data. For the authorised person profile, there should be the possibility to manage the following data:
 - a) Access credentials;
 - b) **Reference to the individual's** profile (personal and contact data);
 - c) Authentication strategy/restrictions (User+Password, electronic/mobile signature, access IP address, etc.);
 - d) Access validity period;
 - e) Roles held;
 - f) Profile Status.
- C. *Profile of Appointer*. Represents the profiles of subjects who appoint people as electoral officials. The following data should be manageable for the **Appointer's** profile:
 - a) IDNO;
 - b) Name of the Subject;
 - c) Organisational and legal type;
 - d) Mailing address;
 - e) Phone number(s);

- f) Email;
- g) Contact persons (and their contact information).

2. Document on actions related to **electoral official's** profile

The REO shall not enable direct entry of data into the database. This should be possible only on the basis of prepared forms **for the actions related to electoral officials' profile**, which shall pass, where appropriate, the approval stage. All changes shall be also done on the basis of prepared specific forms (erroneous forms having the cancel status but being attached to the electoral official's **profile**). The *REO* shall enable the form preparation for the following *actions*:

- A. *Add new electoral official.* This information object shall record the event of primary adding of an electoral official, having managed the following data categories:
 - a) Form Status;
 - b) Form Author;
 - c) Decision-maker;
 - d) Date of event occurrence;
 - e) Event type;
 - f) Electoral official's profile data;
 - g) Form specific content related to the action;
 - h) Data of the act/decision underlying the action;
 - i) Data on the subject who initiated the action;
 - j) Attached documents;
 - k) Electronic Signature.
- B. *Update the electoral official's data* This information object shall record the data updating event of an electoral official's profile, having managed the following data categories:
 - a) Form Status;
 - b) Form Author;
 - c) Decision-maker;
 - d) Date of event occurrence;
 - e) Event type;
 - f) Electoral official's updated profile data;
 - g) Form specific content related to the action;
 - h) Data of the act/decision underlying the action;
 - i) Attached documents;
 - j) Electronic Signature.
- C. *Strike off an electoral official.* This information object shall record the event of striking off an electoral official from *the REO* (logical striking off), having managed the following data categories:
 - a) Form Status;
 - b) Form Author;
 - c) Decision-maker;
 - d) Date of event occurrence;
 - e) Event type;
 - f) Identifier of the electoral official subject to striking off;
 - g) Form specific content related to the action;

- h) Data of the act/decision underlying the action;
 - i) Attached documents;
 - j) Electronic Signature.
- D. *Allocation of electoral officials to elections.* This information object shall record the event of allocating electoral officials to elections, having managed the following data categories:
- a) Form Status;
 - b) Form Author;
 - c) Decision-maker;
 - d) Date of event occurrence;
 - e) Event type;
 - f) Allocated electoral official;
 - g) Place of electoral official's **allocation**;
 - h) The role assigned to the electoral official;
 - i) Form specific content related to the action;
 - j) Data on the subject who initiated the action;
 - k) Data of the act/decision underlying the action;
 - l) Attached documents;
 - m) Electronic Signature.

3. Attached document

This is an information object, which represents all files with copies of documents attached to electronic forms for recording the *actions* related to electoral competitors (confirmatory acts). A document attached to the form is described by the following data:

- File Name;
- Format File;
- Date of File creation;
- File size;
- Relevant application for the File;
- Coding the File content.

4. Elections

This is a group of information objects, which define the data and events related to elections to be managed through *REO*. This group comprises four categories of information objects:

- A. *Elections.* This information object shall record the elections identification data, having managed the following data categories:
- a) Elections Identifier;
 - b) Elections title;
 - c) Elections period;
 - d) Elections type;
 - e) Elections status.
- B. *Allocation of an electoral official.* This information object shall record the event of allocating an electoral official to elections, having managed the following data categories:
- a) Elections;

- b) Date of allocation;
 - c) Allocated electoral official;
 - d) Subject that nominated the electoral official;
 - e) Electoral body where he/she has been assigned;
 - f) The assigned role;
 - g) Authorised User who carried out the appointment;
 - h) Appointment status.
- C. *Electoral body*. This information object shall record the elections infrastructure components (polling stations, constituencies, etc.) where the electoral officials shall be allocated, having managed the following data categories:
- a) Electoral body Identifier;
 - b) Electoral body name;
 - c) Hierarchically superior electoral body;
 - d) Electoral body Type;
 - e) Electoral body Address;
 - f) Electoral body Contacts;
 - g) Electoral body Status;

5. Training of Electoral Officials

This is a group of information objects, which define the data and events related to electoral officials' **training**. This group comprises two categories of information objects, namely:

- A. *Training Course*. This information object shall record the data related to training courses carried out by *CICDE*, having managed the following data categories:
- a) Training Course Identifier;
 - b) Training Course Name;
 - c) Training Type;
 - d) Training Course number of hours;
 - e) Training Course Location;
 - f) Training Period;
 - g) Training Course Subjects;
 - h) Support Materials;
 - i) Trainers;
 - j) Groups;
 - k) Trained Officials;
 - l) Course Status.
- B. *Evaluation of Training*. This information object shall record the electoral official' **training results**, having managed the following data categories:
- a) Training course;
 - b) Date of Evaluation;
 - c) Appraised Electoral Official;
 - d) Appraiser;
 - e) Evaluation rating;

- f) Training Certificate registration date;
- g) Mark/Note.

4.2. IT System Functionalities

The functionalities delivered by *REO* to relevant Actors who have been granted access to this ITSS are displayed in the Use Case diagram shown in Figure 4.2.

Pursuant to the scheme described in Figure 4.2., the IT Subsystem Actors shall have access to 19 Use Cases, which provide the following functionalities:

UC01: Plan Trainings

This is a Use Case, which shall deliver the functionalities necessary to prepare training plans for electoral officials (for each training session it is necessary to entry its title, number of hours, period of training, topics, target trainees and supporting materials). *The REO* shall notify automatically the potential electoral officials and *subjects* they represent about the opportunity to enrol in the planned trainings.

UC02: Configure Trainings

This is a Use Case, which shall deliver the functionalities necessary to configure the training sessions for electoral officials: update the training session data (where appropriate), form the training groups and assign the electoral officials to those groups. *The REO* shall notify automatically all electoral officials and *subjects* they represent on the enrolment into a training session and the training period.

UC03: Entry the Result of Training

This is a complex Use Case, which shall provide the functionalities necessary to entry the training results of electoral officials who attended training courses. The training rating shall be entered for each attendee, as well as the date of issuance of Training Certificates. Use Case UC03 shall enable the generation of documents related to electoral officials' **training**.



Figure 4.2. REO Functionalities.

UC04: Search/view Data

This is a Use Case provided by *the REO* through which the authorised users shall be able to explore the data stock they have access to due to the role held under the IT System and job duties. To this end, *the REO* shall provide a search mechanism, using different criteria, namely:

- electoral official identification data;
- data related to REO authorised Users;
- data related to actions on the electoral official' **profile**;
- identification data of subjects who appoint electoral officials;
- calendar dates related to actions on the electoral official' **profile**;
- data on elections;
- data on electoral bodies;
- electoral official status;
- etc.

The REO shall display as results found:

- **electoral officials' profiles;**
- profiles of subjects who appointed electoral officials;
- actions related to electoral officials.

For each category of results, *the REO* shall enable carrying out the following operations:

- for the profiles of found officials: view **the person's** profile, view the forms with actions related to that official, view the documents with actions related to that official, enrolling the officials in a training course, assigning the official to a polling station, etc.;
- for the profiles of subjects who appoint electoral officials: access the profile content, view the list of related electoral official profiles and access the needed profile, etc.;
- for the actions related to electoral officials: view the document related to the action, access the electronic form to prepare the action, approve/reject the form, etc.

In addition, *the REO* shall provide a mechanism for indexed search of data with full text search options and present the results depending on the relevance of the query outcomes.

UC05: Prepare the Action Related to **Official's** Profile

This is a complex Use Case to provide all electronic forms necessary to record the actions, which affect the electoral official's profile information. Taking into account the peculiarities of such actions, this Use Case shall be implemented in *the REO* context through the following Use Cases:

- UC05.1: Add an official. This represents a functionality, through which a new profile of an electoral official will be added. Largely, the information will be automatically acquired from the SRV (based on **the person's** IDNP) and SRLE (based on the IDNO of the legal entity where the potential electoral official works or which records the electoral official).
- UC05.2: Update official's data. This represents a functionality, through which the identity data, address and identity documents related to an electoral official shall be updated. Largely, the data will be updated through the SRV. Another category of updates comprises the legal entity where the electoral official works or the subject that appointed/designated the electoral official.
- UC05.3: Assign an official for training. This functionality is used to nominate electoral officials for training courses carried out by *CICDE*.
- UC05.4: Assign official to elections. This functionality is used to record the actions of assigning/withdrawing an official to elections. The place of activity and the role assigned to an official shall be specified through this form.
- UC05.5: Strike off an official. This represents a functionality, through which the electoral official's data will be struck off from *the REO*. This should be done when the official died or when other relevant events took place, without physical deletion of the profile should references to this profile be used in other records of *REO* database.

UC06: Generate Documents

This functionality shall be made available to all categories of authorised Users, through which it shall print out all documents related to the process of managing the data about electoral officials.

As a rule, such documents shall be generated on the basis of *REO* information content and result from all *REO* business event electronic forms prepared and approved by authorised users.

UC07: Receive Notifications

This is a Use Case through which *the REO* authorised users shall receive notifications sent by the IT System through email or personal Dashboard.

The REO shall ensure automatic generation and dispatch via email of notifications related to actors engaged in *the REO* activity. The Authorised User shall have the functionality to configure individually the preferences to receive notifications.

UC08: Use the Dashboard

This represents a functionality, through which the *REO* authorised User shall be warned and could view and access quickly all *actions* related to his/her interaction with the IT System *and* job duties (system notifications, events related to workflows, etc.).

Likewise, through the Dashboard mechanism, the authorised User shall have direct access to relevant functionalities of the notified *actions* (direct access to the electronic form to be reviewed, direct approval of electronic forms received for review and approval, etc.).

The *REO* User interface home page shall serve as Dashboard where all elements and components related to the User shall be posted.

UC09: Generate Reports

This is a functionality made available to the following User levels: *EMD User, CICDE User, CEC Decision-maker and Administrator*, which would enable the generation of predefined and ad-hoc reports on the IT System information content.

Such reports are useful for analysing the performed processes, the System information base and electoral officials' **activities**, enabling efficient analysis of training processes, as well as the assignment of electoral competitors during elections, having provided relevant data required to ensure compliance with the legal framework and support decision-making processes.

UC10: Approve/reject Forms

This is a Use Case made available to Users assigned with the role of decision-maker under *the REO (CEC Decision-maker)*, through which he/she would be able to approve/reject the electronic forms intended for updating the data related to electoral officials.

The REO shall provide an approval mechanism for specific electronic forms and documents generated through them (for example: *Add a new electoral official*). This implies setting the approved status and affixing the *CEC Decision-maker* electronic signature.

UC11: Generate Statistics and System Reports

This is a Use Case that provides all functionalities made available to Users assigned with *System Administrator* role, which enable the generation of predefined and ad-hoc administrative reports on *REO* operation events.

Such reports are useful for analysing the processes performed, the IT System information base, the activity performance of authorised Users, anticipating information security issues.

These functionalities will be delivered largely by *SAISE Admin*. *The REO* shall be capable to acquire all relevant data delivered by the logging mechanism provided by *SAISE Admin*.

UC12: Manage Users, Roles, Rights

This Use Case describes the functionalities intended for the *Administrator*, through which the latter shall manage the profiles and roles assigned to authorised actors of the IT System, including the managerial level, external actors, which review and insert data for which authentication shall be done via User Name+Password+IP Address, electronic or mobile signature, LDAP; external IT Systems, etc.

Likewise, this Use Case shall furnish the functionalities necessary **to define the Users'** rights of access to User Interface components and specify the behaviour of User Interface components during the interaction with authorised users.

These functionalities will be delivered largely by the *SAISE Admin ITSS*. *The REO* shall be capable to acquire all rules and configurations of resources and their transitions, Users, roles and *actions* made available to them, etc. through *SAISE Admin*.

UC13: Manage Flows, Forms and Templates

This represents a Use Case intended for IT Subsystem Administrators who implement the functionalities available to them to configure the workflows, electronic forms and document standard templates used for each type of inward/outward document (configuring the area of head letters, footnotes, static and dynamic content, formatting, graphical aspect, etc.).

A document template shall contain inserted beacons through which it would be possible to populate it with content information retrieved from the database content.

These functionalities will be delivered largely by the SAISE Admin ITSS. *The REO* shall be capable to implement all rules and configurations for workflows, electronic forms and document templates specified through *SAISE Admin*.

UC14: Manage Metadata

This is a Use Case that provides all functionalities intended for *System Administrator*, through which the latter shall manage all nomenclatures, classifiers and configurations, forming the *REO* metadata system.

UC15. Other Administration Activities

It represents a Use Case intended for *System Administrators*, which describes all functionalities made available to them to manage and audit *the REO*: maintaining the list and integrity of Users' **credentials** with access to administration space, retrieving the reports from system registries in order to review and detect any eventual issues in terms of *REO* logical and physical security, etc.

Largely, these functionalities will be delivered by the SAISE Admin ITSS to be reused by the *Administrator* for *REO* management. These facilities shall be used to configure and assign the roles to all categories of Users involved in the IT System management and formalisation, defining the parameters for accessing the interface, services, files and database content.

This *REO* management shall implement all functionalities to ensure the IT Subsystem viability and integrity.

UC16: Synchronise Data

This is a Use Case, through which *the REO* shall perform, upon request or automatically, with some regularity, the launch of synchronising procedures with third IT Systems to update the *REO* data. To this end, it is envisaged to implement the following synchronisation categories:

- SRV (State Register of Voters) to acquire the data related to electoral officials;
- SAISE Admin to reuse the SAISE platform services, access the set of shared metadata of SAISE subsystems and acquire the data about elections.
- SRLE (State Register of Legal Entities) to acquire the data on *subjects*, which have electoral officials or where the latter work;
- e-Learning to acquire the relevant information regarding the training of electoral officials and the training results.

All the data synchronising processes with third IT Systems shall be logged, including through the government logging service *MLog*.

UC17: Perform Automatic Actions

This is a Use Case that provides all functionalities aimed at automatic performance of certain actions following the receipt of some data during the process of synchronisation with external IT Systems. *The REO* shall implement the following types of automatic actions:

- update the identity data of electoral officials;
- strike off the electoral officials;
- update the profile data of subjects who appoint electoral officials;
- add the data on training sessions and the details thereof;
- verify the constraints imposed on the prepared electronic forms;
- other relevant checks.

Following the performed automatic actions, *the REO* shall generate a daily summary report to be circulated to all relevant roles (*System Administrators*, as a rule).

UC18: Send Notifications

This is a Use Case, through which the *REO* authorised users shall be notified (in-house messaging or Email) on the occurred *actions*, which affect them.

Users shall receive notification through their personal Dashboard and Email. *The REO* shall ensure the functionality of direct access to business event details (electronic form of *actions* related to electoral officials, profile of electoral officials, etc.) directly from the notification.

The notification platform service of CEC interoperability framework, provided by *SAISE Admin*, will be reused to implement the notification mechanism.

UC19: Logging Events

This is a Use Case, through which it is envisaged to log the *actions* generated by *REO* functional components. Any event generated under the business processes implemented in *the REO* shall be logged and saved in the corresponding Database tables.

For logging it is envisaged to use a platform service of the CEC interoperability framework provided by *SAISE Admin*. *The REO* shall apply the logging strategy of *actions* in the configuring functions of its resources within *SAISE Admin*.

For critical business processes, *the REO* shall implement the logging procedures through the government logging service *MLog*.

4.3. IT System Workflows

The workflows to be implemented under *the REO* have lower complexity and largely entail actions aimed at preparing forms, changing the status, signing the dispatch, approving/rejecting and processing the form action. Under such circumstances, during the business analysis stage, all *REO* workflows shall be set out and documented.

To this end, the following workflows should be implemented:

- Add an electoral official – workflow, through which the primary data of electoral officials is entered;
- Update the electoral official's data – workflow, through which the profile information electoral officials shall be updated;
- Strike off an electoral official – workflow, through which the procedure of striking off the electoral official is carried out;
- Allocate an electoral official to electoral infrastructure – workflow, through which electoral officials are allocated to elections;
- Train electoral officials – workflow, through which training courses are planned and electoral officials are enrolled in the planned courses;
- Synchronise data – workflow, through which automatic synchronisation of *REO* data is carried out through third IT systems;
- Carry out automatic actions – workflow, through which *REO* performs automatic actions (add electoral officials; update electoral officials' data, strike off electoral officials, etc.).

4.4. IT System User Interface

The REO shall offer an ergonomic, intuitive User interface in Romanian (alternatively in Russian) that is accessible to all types of Users through a WEB browser optimised for the resolution of 1360x768. The System shall have an intuitive, agreeable, balanced and distinctly optimised graphical design for all the used devices (desktop computer, notebook, tablet, smartphone).

The CEC best practices implemented in the applications (*SRV*, *FB "Voting"*, etc.) shall be taken into account upon the conceptualisation of User Interface: For Users' **ease**, the IT solution shall have a contextual on-line help system (the Romanian version is mandatory) at the level of User interface.

The REO Users shall have at least six main levels of access to User Interface (sets of rights and roles assigned to them, as well as the optimal number of access groups would be configured by the IT System Administrator through the mechanisms provided by SAISE Admin):

- Access level for DEC User – a level, which is distinctive for DEC Users, who would have specialised interface intended to manage the data of electoral officials assigned to elections.
- Access level for EMD User – a level, which is distinctive for CEC officials from the *Elections Management Division*, who will use the facilities granted by REO User Interface to exercise their job duties (manage the data stock on electoral officials, prepare elections, allocate human resources to elections, using the data provided by REO, generate analytical reports and prepare decisions related to electoral officials, etc). This type of Users shall authenticate themselves by User_Name+Password or Active Directory.
- Access level for CICDE User – a level, which is distinctive for the authorised people from the *Centre for Continuous Electoral Training*, who will use the facilities granted by REO User Interface to exercise their job duties (prepare training courses, form training groups. This type of Users shall authenticate themselves by User_Name+Password or Active Directory.
- Access level for CEC Decision-maker – a level, which is distinctive for the CEC authorised people (people designated from CICDE, CEC divisions and units, etc.), assigned with the role to approve/reject draft documents prepared under *the REO* and have access to analytical mechanisms for data processing to support the decision-making process.
- Access level for System Administrator – a level, which is distinctive for the User with the highest access level to the IT System resources. The System Administrator shall authorise his/her access through Name User_Name+Password or Active Directory. This level, due to the assigned role to manage smooth operation of the IT solution, shall ensure access to all functionalities of User Interface and database content provided by User Interface.

The procedures for restoring the information and records shall be carried out through simple searches (specifying some search series) or through more complex searches, which would allow more accurate filtering of information (QBE forms). Regardless of the nature of searched information, the User shall apply the same method for information querying and restoring for each Section of the IT product.

In addition to the search module based on QBE principle, which would enable defining visual sophisticated queries, the interface shall provide the possibility to fine-tune the search results by granting the possibility to filter the data in the list of search results.

The IT System User Interface shall ensure the possibility to filter the records, which match the search criterion granted to Users depending on their rights of access.

The indexed values (values from the classifiers, nomenclatures) should be filtered by choosing the value from predefined lists. For numerical types of fields or calendar data there should be the possibility to filter as per the exact value of the searched characteristic (*Example: 20.10.2019 – all records with the specified date*) or by logical criteria (*Example: <31.12.2018 – all records with the date older than 31.12.2018, >01.01.2019 – all records with the date more recent than 01 January 2019*).

Likewise, it should be granted the possibility to filter the result according to the mask (*for example, filtering by IDNP*) as per the sample: 098121224* – all the records that begin with the series of characters "098121224", *ARU – all the records that end with the series of characters "ARU" or *PARTID* – all the records that comprise the series of characters "PARTID" in their content.

The content of any table with results or electronic format, depending on the type of information comprised, shall have the possibility to be exported in any of the following format: CSV, RTF and PDF.

4.5. IT System Reporting, Audit and Statistics Mechanism

The REO should have implemented functionalities intended for auditing/logging widely used in this area. This is configurable for logging technical and *actions*. The IT System shall deliver a mechanism to generate predefined and ad-hoc reports capable to ensure a pertinent review or assessment of the processes aimed at managing the electoral officials' **data**.

The REO shall furnish a mechanism intended for dynamic and varied generation of ad-hoc reports, enabling the configuration of parameters to generate reports, including the choice of the data aggregation method (average, median, maximum, minimum, quantification of elements, etc.).

The REO reporting system will delineate four categories of reports:

- Documents generated on the basis of a predefined template – a template should be created for each type of document to be populated with the information relevant for the document (for example: *Add an electoral official, Update an electoral official data, Strike off an electoral official, Performance appraisal of electoral officials, Approve/reject the draft form, etc.*);
- Performance Indicators – a set of KPI based on which the electoral officials performance and potential could be appraised, **as well as the IT System performance, the Registrars' activity** performance, etc.;
- Monitoring Reports – a category of reports intended for Users assigned with decision-making role used to appraise the interaction manner of authorised Users with *the REO*. This category of reports shall organise and display the file content, based on which the IT System vulnerabilities will be reviewed and anticipated;
- Performance Reports – a category of static reports (as a rule, implemented physically in the IT System content) intended for auditing and reviewing the *REO* information content. The Developer shall integrate at least 30 categories of such reports, which layouts have been included in Annex 1 and will be provided additionally at the time of carrying out the business analysis.

The reporting mechanism peculiarities are described in a series of sections of this document, such as:

- Section 5.1.6 (functional requirements of *UC02: Generate documents*);
- Section 5.1.9 (functional requirements of *UC05: Generate reports*);
- Section 5.1.11 (functional requirements of *UC07: Generate statistics and system reports*);
- Section 5.1.13 (functional requirements of *UC09: Manage flows, forms and templates*);

5. Requirements Put Forward for the IT Subsystem

5.1. IT Subsystem Functional Requirements

5.1.1. UC01: Plan Trainings

The functional requirements set out for the component used to configure the training plan for electoral officials are displayed in Table 5.1.

Table 5.1. Functional requirements of UC01.

Identifier	Binding level	Description of Functional Requirements
FR 01.01.	M	<i>The REO</i> shall furnish an electronic template intended to prepare the training plans for electoral officials.
FR 01.02.	M	A training plan includes the main configurations of training session: name of the training, the number of the foreseen training hours, the training calendar period, training subjects, the training target group and supporting materials.
FR 01.03.	M	Once a planned training course has been prepared and approved, <i>the REO</i> shall automatically notify all potential electoral officials and <i>subjects</i> to enrol in a training course.

5.1.2. UC02: Configure Trainings

The functional requirements set out for the component used to configure the training sessions of electoral officials are displayed in Table 5.2.

Table 5.2. Functional requirements of UC02.

Identifier	Binding level	Description of Functional Requirements
FR 02.01.	M	<i>The REO</i> shall furnish an electronic template intended to configure the training sessions for electoral officials.
FR 02.02.	M	Configuring training sessions for electoral officials presupposes updating the data about the training course (should divergences occur relative to the plan), setting the training groups and assigning the electoral officials in training groups.
FR 02.03.	M	<i>The REO</i> shall furnish functionalities to define the criteria for including the electoral officials, using the data comprised by the training applications, as well as specific criteria (geographic area of electoral officials, history of previous trainings attended by electoral officials, etc.).
FR 02.04.	M	<i>The REO</i> shall enable the inclusion into training groups
FR 02.05.	M	<i>The REO</i> shall automatically notify the electoral officials and entities, which required trainings about the training session details.

5.1.3. UC03: Enter training results

The functional requirements set out for the component of preparing the electoral officials' **training results** are displayed in Table 5.3.

Table 5.3. Functional requirements of UC03.

Identifier	Binding level	Description of Functional Requirements
FR 03.01.	M	<i>The REO</i> shall furnish an electronic template intended to enter the training results of electoral officials.
FR 03.02.	M	Entering the training results of an electoral official presupposes entering the training qualifier, data of the issued certificate and optional completing a note justifying the qualifier or documenting some events inspiring the appraisal result.
FR 03.03.	M	<i>The REO</i> shall enable defining the rules and rights of Users assigned with the role to enter the appraisal results, training results (trainer or operator assigned with specific role and rights).
FR 03.04.	M	<i>The REO</i> shall prepare automatically a form to enter the learners' appraisal results based on the data furnished by UC02, while the access reference shall be placed in the User's personal Dashboard and in the notification on the need to appraise the training result of electoral officials.
FR 03.05.	M	A training appraisal form may comprise the data of more officials subject to appraisal (all training course attendees).
FR 03.06.	M	Based on the training appraisal form an appraising document may be generated retrieved through UC06.
FR 03.07.	M	<i>The REO</i> shall furnish a functionality to generate a training certificate on the basis of data contained in the training appraisal form.
FR 03.08.	D	The Appraiser shall sign electronically the performance appraisal form of the electoral official during elections.
FR 03.09.	D	<i>MSign</i> platform service shall be used as an electronic signature mechanism.
FR 03.10.	M	The training appraisal results shall be attached to electoral official profiles.

5.1.4. UC04: Search/vies Data

The functional requirements necessary to define the information search queries in the REO content of data collections and manage the obtained results are displayed in Table 5.4.

Table 5.4. Functional requirements of UC04.

Identifier	Binding level	Description of Functional Requirements
FR 04.01.	M	<i>The REO</i> shall furnish data and document search and view mechanism in the data stock content.
FR 04.02.	D	<i>The REO</i> shall furnish a mechanism for indexed search of data. The search mechanism shall use morphologic means.
FR 04.03.	M	<i>The REO</i> shall enable defining the following search targets (the search result shall display the list of): <ul style="list-style-type: none"> ■ electoral officials' profiles; ■ profiles of subject appointers of electoral officials; ■ <i>actions</i> related to electoral officials.
FR 04.04.	M	<i>The REO</i> shall furnish a flexible and efficient mechanism to define the search criteria.
FR 04.05.	M	<i>The REO</i> shall enable the use of at least the following search parameters: <ul style="list-style-type: none"> ■ electoral official identification data;

Identifier	Binding level	Description of Functional Requirements
		<ul style="list-style-type: none"> ■ data related to REO authorised Users; ■ date related to <i>actions</i> afferent to electoral official; ■ identification data of subjects appointing electoral officials; ■ calendar dates related to <i>actions</i> afferent to electoral officials; ■ data on elections; ■ data related to electoral body; ■ electoral official status; ■ other relevant criteria.
FR 04.06.	M	When setting too wide search criteria or those requiring too much time and resources for execution, <i>the REO</i> will not perform such queries, asking the User to narrow the area of searched values.
FR 04.07.	M	The search results will be ordered depending on the relevance of the search query result, alphabetically or by the date of creation/last update.
FR 04.08.	M	The User shall be able to define criteria for ordering and grouping the content of the list with the search results.
FR 04.09.	M	<i>The REO</i> shall provide a mechanism to page the search results intended to avoid the overloading of WEB browser and data transportation channels.
FR 04.10.	D	The records of search results will be marked (colour or specific icon) depending on the nature or status of the found information object.
FR 04.11.	M	<i>The REO</i> shall furnish a functionality to fine-tune the search in the results found.
FR 04.12.	M	<p><i>The REO</i> shall enable triggering certain processes over the results found or over a group of results found and marked, such as:</p> <ul style="list-style-type: none"> ■ for the profiles of officials found: view the person's profile, view the forms containing the actions related to the official, view the documents containing actions related to the official, enrol the officials in a training course, assign the official to a polling station, etc.; ■ for the profiles of subjects appointing the electoral officials: access the profile content, view the list of profiles of related electoral officials and access the needed profile, etc.; ■ for <i>actions</i> related to profiles of electoral officials: view the document related to the event, access the electronic form for preparing the <i>actions</i>, approve/reject the form, etc.; ■ multiple deletion; ■ multiple electronic signature; ■ other relevant actions.
FR 04.13.	M	<i>The REO</i> shall display in the search results only the data that match the User's area of competence (his/her roles and rights).
FR 04.14.	M	<i>The REO</i> shall restrict the access to the details of the results found when the User who triggered the searching process does not have access to the information objects required to be accessed.
FR 04.15.	M	<i>The REO</i> shall enable exporting the Table with the search results in CSV, RTF or PDF format.

5.1.5. UC05: Prepare an action related to official's profile

The functional requirements set out for the component aimed to prepare electronic forms intended to document the *actions* related to electoral officials are displayed in Table 5.5.

Table 5.5. Functional requirements of UC05

Identifier	Binding level	Description of Functional Requirements
FR 05.01.	M	<i>The REO</i> shall furnish electronic forms intended to record the <i>actions</i> related to electoral officials.
FR 05.02.	M	It is envisaged to implement the electronic forms for recording the following <i>actions</i> specific for the electoral official profile: <ul style="list-style-type: none"> ■ add an electoral official; ■ update the electoral official recording data; ■ assign an electoral official to training; ■ assign an electoral official to elections; ■ strike off an electoral official.
FR 05.03.	D	Statuses and transitions via which electronic forms intended to record the <i>actions</i> related to electoral officials may go through are configured under UC12.
FR 05.04.	M	Any electronic form intended to prepare the data on <i>actions</i> related to electoral officials shall have associated a document template, which will be configured under UC13 and populated on the basis of the data contained in the form.
FR 05.05.	M	The electronic form intended to record <i>actions</i> related to electoral officials may be required from the electoral official's profile (with automatic completion of data in advance) or from the options of User Interface intended for preparing such forms.
FR 05.06.	M	<i>The REO</i> shall ensure access to the functionality of recording the categories of <i>actions</i> related to electoral officials depending on the roles and rights held by authorised users.
FR 05.07.	M	An electronic form intended to record <i>actions</i> related to electoral official shall be prepared through exclusively visual mechanisms.
FR 05.08.	M	The electronic forms implemented under UC04 shall comprise constraints and content restrictions in order to limit mechanical errors.
FR 05.09.	M	The sections of electronic forms intended to record <i>actions</i> related to electoral officials may be filled in with narrative text, numbers, attached files or values of REO nomenclatures or classifiers.
FR 05.10.	M	<i>The REO</i> shall enable the generation of documents in editable format (through UC05) based on the content of electronic forms intended to record the <i>actions</i> related to electoral officials to be printed out or provided in electronic format.
FR 05.11.	M	<i>The REO</i> shall enable attaching external documents to the form (attaching the document scanned copies in PDF format).
FR 05.12.	M	<i>The REO</i> shall furnish a mechanism to check the accuracy of the prepared electronic forms intended to record <i>actions</i> related to electoral officials (binding level of data content, accuracy of inserted type of data, recording the entered data, etc.).
FR 05.13.	M	Only the electronic forms intended to record <i>actions</i> related to electoral officials, who passed successfully the verification procedure in terms of accurate preparation, shall be sent <i>to CEC Decision-maker</i> for approval.
FR 05.14.	D	<i>The REO</i> shall furnish a functionality to affix the electronic signature on electronic forms intended to record the <i>actions</i> related to electoral officials.

Identifier	Binding level	Description of Functional Requirements
FR 05.15.	D	<i>M</i> Sign platform service shall be used as a mechanism for affixing the electronic signature.
FR 05.15.	M	<i>The REO</i> shall notify automatically <i>to CEC Decision-maker</i> about receiving an electronic form intended for recording <i>actions</i> related to electoral officials for review and approval (the form is to be approved through UC10).
FR 05.16.	M	The electronic form intended to record <i>actions</i> related to electoral official sent for approval may be edited again if it was rejected by the <i>CEC Decision-maker</i> .
FR 05.17.	M	Once the form electronic intended to record <i>actions</i> related to electoral official has been signed and approved, <i>the REO</i> shall notify all the actors engaged in the process.
FR 05.18.	M	<i>The REO</i> shall log all <i>actions</i> aimed at editing and processing the electronic forms used to record <i>actions</i> related to electoral officials.
FR 05.1.01	M	<i>The REO</i> shall furnish electronic forms intended to add a new electoral official.
FR 05.1.02	M	The identity data, identity documents held and address of domicile/residence of electoral officials shall be acquired from the <i>SRV</i> based on IDNP code of the electoral official (these data will be imported from the <i>SRV</i> without enabling their manual entry).
FR 05.1.03	M	The electronic form used to add a new electoral official shall enable attaching electronic documents related to the official, as well as inserting additional supporting information.
FR 05.1.04	M	A form used to create a new electoral official profile shall have associated a document requiring to create an electoral official profile generated through UC06.
FR 05.1.05	M	For a series of REO roles, adding an official profile shall be possible only after the decision-making roles approved it (through UC10).
FR 05.1.06	M	The profile of a new electoral official shall be added only when the form has been sent for execution.
FR 05.1.07	M	Prior to sending the form for execution, it shall be subject to verification in terms of its preparation correctness (through UC17).
FR 05.1.08	D	Sending the form for execution shall be preceded by affixing the electronic signature on the form aimed to add a new electoral official.
FR 05.1.09	M	Where appropriate, the form aimed to add a new electoral official shall be sent for execution if it was validated by <i>the REO</i> and, where appropriate, it was signed electronically and approved by the REO decision-making roles.
FR 05.2.01	M	<i>The REO</i> shall furnish an electronic form intended to update the electoral official profile.
FR 05.2.02	M	The identity data and address of domicile/residence of electoral officials shall be updated from the <i>SRV</i> based on IDNP code of the electoral official (these data will be imported from the <i>SRV</i> without enabling their manual editing).
FR 05.2.03	M	The form used to update the electoral official profile shall enable attaching electronic documents related to that official, as well as inserting additional supporting information.
FR 05.2.04	M	A form used to update the electoral official profile shall have associated a document requiring to update the data generated through UC06.

Identifier	Binding level	Description of Functional Requirements
FR 05.2.05	M	While updating certain specific data (identity data, address and domicile/residence data, etc.), <i>the REO</i> shall furnish a mechanism for profile versioning, so that the historical data are used in the transactions preceding the update (for example: <i>upon changing the name of the official, all the events where the official appears and up until the date when the name was changed the previous name would be used</i>).
FR 05.2.06	M	For a number of REO roles, updating the profile of an official should be possible only after the form was approved by decision-making roles (through UC10).
FR 05.2.07	M	The profile of an electoral official shall be updated only when the form has been sent for execution.
FR 05.2.08	M	Prior to sending the form for execution, it shall be subject to verification in terms of its preparation correctness (through UC17).
FR 05.2.09	D	Sending the form for execution shall be preceded by affixing the electronic signature on the form aimed to add a new electoral official.
FR 05.2.10	M	Where appropriate, the form aimed to add a new electoral official shall be sent for execution if it was validated by <i>the REO</i> and, where appropriate, it was signed electronically and approved by the REO decision-making roles.
FR 05.3.01	M	<i>The REO</i> shall furnish an electronic form intended to require/claim training for an electoral official.
FR 05.3.02	M	Un electronic form intended to require/claim training for an electoral official shall be instantiated from a notification requiring training for certain people sent by UC01.
FR 05.3.03	M	<i>The REO</i> shall furnish a functionality to search /filter quickly the electoral officials to be trained (taking into account the geographical area, roles of electoral officials, political affiliation, training certificates held, etc.).
FR 05.3.04	M	The form requiring training shall enable including several electoral officials for training in the same form (for example: <i>a political party may delegate 10 officials for training</i>).
FR 05.3.05	M	The form requiring training shall have associated a document requiring officials' training generated through UC06.
FR 05.3.06	M	For a series of REO roles, acceptance of electoral officials for training shall be possible only when the form has been approved by decision-maker roles (through UC10).
FR 05.3.07	M	The decision-maker may approve the form as a whole or just several electoral officials.
FR 05.3.08	M	Prior to sending the request for training it shall be subject to verification in terms of its preparation correctness (through UC17).
FR 05.3.09	D	Prior to sending the request for training, the relevant form shall be signed electronically.
FR 05.4.01	M	<i>The REO</i> shall furnish an electronic form intended to assign an official to electoral bodies (polling station, electoral council, etc.).
FR 05.4.02	M	The assignment presupposes stating the name of the electoral official, the place where he/she would work (for example: <i>a specific polling station</i>) and the role held (for example: <i>member of a polling station, chairperson of a polling station, etc.</i>).
FR 05.4.03	M	<i>The REO</i> shall furnish functionality for rapid search/filtering of data on

Identifier	Binding level	Description of Functional Requirements
		electoral officials to be assigned to elections infrastructure (taking into account the geographical area, the previous roles of electoral officials, their previous experience, etc.).
FR 05.4.04	M	The assignment form shall enable including several electoral officials in the same form.
FR 05.4.05	M	An assignment form shall have associated a document for assigning the officials generated through UC06.
FR 05.4.06	M	For a series of REO roles, the assignment of an official is possible only when the form has been approved by decision-makers (through UC10).
FR 05.4.07	M	The decision-maker may approve the form as a whole or just several electoral officials.
FR 05.4.08	M	Prior sending the form for execution, it shall be subject to verification in terms of its preparation correctness (through UC17), which would take into account the admissibility of including the officials, completeness of data, etc.
FR 05.4.09	D	Prior to sending the form of official assignment to elections, it shall be signed electronically.
FR 05.4.10	M	Where appropriate, the electoral official shall be assigned if the assignment form has been validated by <i>the REO</i> and, where appropriate, it was signed electronically and approved by the REO decision-making roles.
FR 05.4.11	M	<i>The REO shall furnish functionality for automatic assignment of electoral officials as per the historical data held (for example: automatic allocation of all members of polling stations using the data on previous elections, etc.)</i>
FR 05.5.01	M	<i>The REO shall furnish an electronic form intended to strike off an electoral official.</i>
FR 05.5.02	M	As a rule, striking off shall be done automatically while synchronising specific events in the SRV (death, renouncing to citizenship, etc.).
FR 05.5.03	M	The electronic form used to strike off an electoral official shall enable attaching confirmatory electronic documents, as well as inserting additional supporting information.
FR 05.5.04	M	A form used to strike off an electoral official shall have associated a document requesting to strike off the electoral official generated through UC06.
FR 05.5.05	M	For a series of REO roles, striking off an official shall be possible only if it was approved by decision-making roles (through UC10).
FR 05.5.06	M	An electoral official shall be struck off only when the form has been sent for execution.
FR 05.5.07	M	Prior to sending the form for execution, it shall be subject to verification in terms of its preparation correctness (through UC17).
FR 05.5.08	D	Prior to sending for execution the form for striking off an electoral official it shall be signed electronically.
FR 05.5.09	M	Where appropriate, the form for striking off an electoral official shall be sent for execution if it has been validated by <i>the REO</i> and, where appropriate, it was signed electronically and approved by the REO decision-making roles.

5.1.6. UC06: Generate Documents

The functional requirements set out for the component aimed to generate standard documents based on the information contained in the REO database are displayed in Table 5.6.

Table 5.6. Functional requirements of UC06.

Identifier	Binding level	Description of Functional Requirements
FR 06.01.	M	<i>The REO</i> shall furnish to relevant Users a mechanism to generate standard documents populated with data from the REO database.
FR 06.02.	M	Amongst the generated standard documents one could mention the documents related to all transactions aimed to manage the profiles of electoral officials: <ul style="list-style-type: none"> ■ Personal card of an electoral official (a summary of data from all business event forms of the electoral official profile, which retrieve the history of his/her interaction with elections); ■ Request to add a new official; ■ Request to update the recorded data of an existing official; ■ Request to strike off an official; ■ Request to assign an official during elections; ■ Request to withdraw an official from elections; ■ Details regarding the training of an electoral official; ■ Training certificate of an electoral official; ■ Appraisal statement of trained electoral officials; ■ Notification sent by <i>the REO</i>; ■ Other relevant documents.
FR 06.03.	M	<i>The REO</i> shall enable the generation of documents based on the content of electronic forms prepared within the automated processes by <i>the REO</i> .
FR 06.04.	M	Documents intended for printing out shall be generated on the basis of templates configured through UC13.
FR 06.05.	M	All the generated documents shall be in PDF format.
FR 06.06	M	<i>The REO</i> shall ensure access to the set of documents to be generated and printed out depending on the roles and rights held by each User individually.
FR 06.07	M	A generated document may be signed electronically by <i>the REO</i> .
FR 06.08	M	The Developer shall implement up to 20 categories of documents to be generated by the REO (including those mentioned under FR 06.02)
FR 06.09	M	<i>The REO</i> shall log all the events related to document generation and printing.

5.1.7. UC07: Receive Notifications

The functional requirements set out for implementing the mechanism intended to receive notifications sent by the *REO* to authorised Users are displayed in Table 5.7.

Table 5.7. Functional requirements of UC07.

Identifier	Binding level	Description of Functional Requirements
FR 07.01.	M	<i>The REO</i> shall notify automatically any authorised User in case of recording a business event involving the action of the User or changing the status of processes he/she manages or monitors or the processes he/she is

Identifier	Binding level	Description of Functional Requirements
		concerned with.
FR 07.02.	M	The authorised Users shall receive notifications to the Email address stated in their REO profile.
FR 07.03.	M	A copy of the notification shall be displayed on the User Dashboard.
FR 07.04.	M	The authorised User shall have the functionality to configure the preferences to receive notifications to the Email address.
FR 07.05.	M	<p><i>The REO</i> shall send the whole range of notifications intended for the electoral competitors, political parties, NGOs, etc. on their interaction with <i>CEC</i> in terms of business processes related to electoral officials:</p> <ul style="list-style-type: none"> ■ notification on the need to nominate electoral officials for training; ■ notification on appointing the electoral officials to elections; ■ notification on expiring the deadline for sending the requested data; ■ notification on accepting <i>actions</i> related to electoral officials (add a new electoral official, update the data of an existing electoral official, etc.) prepared and sent for approval; ■ notification on non-acceptance of <i>actions</i> related to electoral officials prepared and sent for approval; ■ other relevant notifications.
FR 07.06.	M	<p><i>The REO</i> shall send the whole range of notifications intended for <i>CEC</i> authorised Users:</p> <ul style="list-style-type: none"> ■ notification on receiving new forms with <i>actions</i> related to electoral officials for verification and approval; ■ notification on the need to engage in the workflows; ■ notification on delayed User's action (exceeding the deadline set for the verification of received forms, adoption of a decision, etc.); ■ notifications on the tasks executed automatically as a result of data synchronisation with third IT Systems; ■ other relevant notifications.
FR 07.07.	M	Where appropriate, a notification shall contain hypertext reference to access the object concerned (electronic form, electoral official's profile , etc.).
FR 07.08.	M	Where appropriate, a notification may comprise attached files, generated on the basis of business event details, which generated it.

5.1.8. UC08: Use Dashboard

The functional requirements intended for the operation of Dashboard by authenticated and authorised Users assigned with specific roles are displayed in Table 5.8.

Table 5.8. Functional requirements of UC08.

Identifier	Binding level	Description of Functional Requirements
FR 08.01.	M	<i>The REO</i> shall provide to authorised Users with specific roles Dashboards through which they would be notified on important <i>actions</i> and granted quick access to their details.
FR 08.02.	M	The following categories of <i>actions</i> displayed on the <i>Dashboard</i> can be

Identifier	Binding level	Description of Functional Requirements
		<p>listed:</p> <ul style="list-style-type: none"> ■ system notifications; ■ notifications on the need to engage the User in REO workflow activities (including warnings for the delay); ■ notifications on forms or documents pending approval by decision-making roles (including warnings for the delay); ■ notifications on transactions processed automatically upon synchronisation with third IT Systems; ■ notifications on accepted/rejected electronic forms regarding the <i>actions</i> related to electoral official profile; ■ other relevant events.
FR 08.03.	M	The REO User Dashboard shall display only the <i>actions</i> relevant to roles and data available to the User.
FR 08.04.	M	The Dashboard shall group the <i>actions</i> , having displayed them as indicators with aggregated values (for example: <i>Unread system notifications – 20; Forms under consideration – 4; Sent forms – 5, etc.</i>), which will contain hypertext reference to access the details.
FR 08.05.	M	<i>The REO</i> shall display detailed records of the <i>Dashboard</i> in specialised windows or fields on the User Interface main page, which will contain hypertext reference to access the details.
FR 08.06	M	Upon accessing the hypertext reference related to the aggregated value or detailed records, the REO Dashboard shall ensure access to detailed information related to them or the requested functionality (for example: <i>the content of the form to update the data of the electoral official, direct approval/rejection of forms sent for consideration and approval, etc.</i>).
FR 08.07.	M	The REO Dashboard shall comprise a specialised (favourite) area where the User shall post references to content information he/she works on. These could be of three types: <ul style="list-style-type: none"> ■ subjects appointing/designating the electoral officials; ■ electronic forms prepared (forms with draft status); ■ electronic forms considered (electronic forms pending approval by decision-makers).
FR 08.08.	M	<i>The REO</i> shall provide each User with the functionality for individual configuration of the <i>Dashboard</i> appearance and content.

5.1.9. UC09. Generate Reports

The functional requirements set out for the mechanism to retrieve the reports on data processing and their display in a way convenient for Users or to support the decision-making process are displayed in Table 5.9.

Table 5.9. Functional requirements of UC09.

Identifier	Binding level	Description of Functional Requirements
FR 09.01.	M	<i>The REO</i> shall be able to provide a number of statistical, management and ad-hoc reports, so that the Users assigned with administrative roles could monitor the system operation and condition/status.
FR 09.02.	D	The reporting mechanism shall allow for dynamic configuration and generation of ad-hoc reports.
FR 09.03.	M	<i>The REO</i> shall make available to Users assigned with administrative roles a

Identifier	Binding level	Description of Functional Requirements
		standard number of configurable reports and authorise in an easy way the production of ad-hoc reports where necessary.
FR 09.04.	M	<p><i>The REO shall provide un set of reports intended for data processing or retrieval regarding the CEC interaction with electoral competitors during the election campaign:</i></p> <ul style="list-style-type: none"> ■ authorised User 's performance report, comprising statistics and details on managed data (forms prepared, forms processed, etc. with different level of aggregation; ■ performance of participants from districts during the appraisal test, including from the gender perspective (as per Table A1.1 from Annex 1); ■ Number of women and men by each subject/topic (as per Table A1.2 from Annex 1); ■ Numerical Table of people designated for training by subjects and districts (as per Table A1.3 from Annex 1); ■ Percentage and numerical analysis of the share of trained women and men by administrative and territorial units (as per Table A1.4 from Annex 1); ■ Percentage and numerical analysis of the share of certified and non-certified officials by administrative and territorial units (as per Table A1.5 from Annex 1); ■ Analysis of data on trained people by education background and by administrative and territorial units (as per Table A1.6 from Annex 1); ■ Analysis of data on trained people by professions and by administrative and territorial units (as per Table A1.7 from Annex 1); ■ Analysis of data on trained people by language skills (as per Table A1.8 from Annex 1); ■ Analysis of data on trained people by their experience in elections by administrative and territorial units (as per Table A1.9 from Annex 1); ■ Analysis of data on trained people by the position held by administrative and territorial units (as per Table A1.10 from Annex 1); ■ Analysis of data on trained people by elections they were engaged in (as per Table A1.11 from Annex 1); ■ Analysis of data on trained people by age, by administrative and territorial units (as per Table A1.12 from Annex 1); ■ Report on issued certificates (as per Table A1.13 from Annex 1).
FR 09.05.	M	A User who can view a report within the system shall be able to export it into an external editable file (DOC/DOCX, CSV or XLS/XLSX).
FR 09.06.	M	By default, the reports shall be retrieved in .PDF format.
FR 09.07.	M	Overall, the Developer shall implement up to 30 categories of predefined reports requested by the Beneficiary (including those mentioned under FR 09.04.

5.1.10. UC10: Approve/reject Forms

The functional requirements set out for the component intended for CEC Users assigned with decision-making roles to approve or reject the electronic forms produced via the *REO* are displayed in Table 5.10.

Table 5.10. Functional requirements of UC10.

Identifier	Binding level	Description of Functional Requirements
FR 10.01.	M	<i>The REO</i> shall furnish to authorised actors (<i>CEC Decision-makers</i>) a mechanism to approve or reject the electronic forms prepared by authorised users through UC01-UC03, UC05, which require approval to update the relevant data.
FR 10.02.	M	Over the business analysis, the workflows and sets of forms requiring approval shall be defined.
FR 10.03.	M	The process of approval or rejection shall include producing a note and selecting the status (<i>Approved</i> or <i>Rejected</i>).
FR 10.04.	D	<i>The REO</i> shall furnish a functionality to sign electronically the form with approval/rejection decision.
FR 10.05.	D	<i>The REO</i> shall implement <i>MSign</i> to affix the electronic signature upon the approval/rejection of the electronic form.
FR 10.06	M	When the electronic form has been approved, the <i>REO</i> shall notify all relevant Users of that form.
FR 10.07	M	Acceptance of <i>REO</i> electronic form shall trigger the processes related to that form (add an official, update the official data, etc.)
FR 10.08	M	When the electronic form was rejected, the workflow shall return to the previous stage (shall return the form to the User who sent it for a new preparation) and shall notify all relevant Users.
FR 10.09	M	At the time when a form is sent for approval it can be amended only by the Decision-maker who shall approve it by affixing repeatedly his/her electronic signature.
FR 10.10	M	<i>The REO</i> shall log all the events on electronic forms approval/rejection.

5.1.11. UC11: Generate Statistics and System Reports

The functional requirements set out for the component aimed to retrieve reports to be subject to REO auditing are displayed in Table 5.11.

Table 5.11. Functional requirements of UC11.

Identifier	Binding level	Description of Functional Requirements
FR 11.01.	M	<i>The REO</i> shall be able to provide a number of management, statistical and ad-hoc reports so that the Users assigned with administrative roles can monitor the System operation and status.
FR 11.02.	M	The reports managed via <i>UC11</i> are intended for auditing purposes and do not include any reports related to the content of REO data stock generated through UC09.
FR 11.03.	M	Such reporting is required for the entire system, including: <ul style="list-style-type: none"> ■ nomenclatures and classifiers; ■ DB records; ■ User activity; ■ access authorisations and security.
FR 11.04.	M	The reports shall be generated on the basis of the following logged events:

Identifier	Binding level	Description of Functional Requirements
		<ul style="list-style-type: none"> ■ successful authentication of Users; ■ unsuccessful authentication of Users; ■ notifications sent; ■ actions performed on data (access, add, change, delete).
FR 11.05.	M	<i>The REO shall allow for aggregated retrieval of reports or their breakdown per each specified User, Political Party/ Electoral Competitor, CEC subdivision or per certain groups of Users.</i>
FR 11.06.	M	A User who views a report within the system shall be able to export it to an external editable file.
FR 11.07.	M	The Developer shall implement up to 10 predefined audit reports requested by the <i>CEC</i> . For the audit reports that can be generated via the system means, there is no need to implement them in the REO User Interface.
FR 11.08.	M	To retrieve system reports and statistics relevant for <i>UC11</i> it is appropriate to reuse the mechanisms provided by <i>SAISE Admin</i> .

5.1.12. UC12: Manage Users, Roles, and Rights.

The functional requirements set out by User administration component and configuring the access to the *REO* User Interface and database content are mirrored in Table 5.12.

Table 5.12. Functional requirements of UC12.

Identifier	Binding level	Description of Functional Requirements
FR 12.01.	M	<i>The REO shall reuse the mechanism for defining and managing the Users, their roles and rights provided by SAISE Admin.</i>
FR 12.02.	M	User authentication shall be done through the facilities provided by <i>SAISE Admin and MPass</i> , having used one of the following strategies: User Name+Password, IP Address, electronic signature, mobile signature or <i>LDAP</i> .
FR 12.03.	M	<i>The REO shall take into account the User's authentication preference</i> (electronic signature, mobile signature, User Name+Password, IP Address or their combination).
FR 12.04.	M	User authorisation shall be done through the facilities provided by <i>SAISE Admin</i> .
FR 12.05.	M	<i>The REO shall contain a default category of Users created by the Developer and its credentials are provided upon delivery for the Super Administrator category.</i>
FR 12.06.	M	<i>The REO shall enable blocking/unblocking User's access.</i>
FR 12.07.	M	<p>Under the Users' profiles the following categories of data would be managed:</p> <ul style="list-style-type: none"> ■ User Last Name; ■ User First Name; ■ contact Email address; ■ contact phone number; ■ access login; ■ access Password; ■ authentication strategy (User+Password, electronic/mobile

Identifier	Binding level	Description of Functional Requirements
		signature, LDAP, etc.); <ul style="list-style-type: none"> ■ active/deactivated account; ■ access validity period; ■ User's roles; ■ other relevant data.
FR 12.08.	M	<i>The REO shall take into account Users' configurations in SAISE Admin regarding the access rights to data depending on the categories or types of electronic forms prepared or the prepared and accessed data.</i>
FR 12.09.	M	An authorised User account can be physically deleted only when it contains no logged events produced or data keyed in by that User.
FR 12.10.	M	<i>The REO shall take into account Users' configurations in SAISE Admin to ensure access to User Interface and IT System information content for each User individually or group of Users.</i>
FR 12.11.	M	The IT System shall enable configuring an unlimited number of roles through the facilities provided by <i>SAISE Admin</i> .
FR 12.12.	M	A role is defined by its generic name, short description and status (active/deactivated). The deactivated roles will not be displayed upon configuring the access rights to the application resources or Users' rights .
FR 12.13.	M	Once entered, activated and configured in <i>SAISE Admin</i> , <i>the REO</i> shall take into account all System configurations during its interaction with authorised Users.
FR 12.14.	M	A role could not be deleted if it is attached to at least one User or one User Interface component of <i>the REO</i> .
FR 12.15.	M	<i>The REO shall reuse the mechanism to record the User Interface components (resources) provided by SAISE Admin to define Users' access rights to User Interface.</i> By component it is meant any modular entity of the application (form, menu, menu option, field, etc.), which detail level is sufficient to configure access rights, workflows transitions and actions made available to Users.
FR 12.16.	M	Any component of REO User Interface shall contain data on its generic name, brief description, actions available to Users roles (<i>actions</i> they can generate) that have access to User interface or action component.
FR 12.17.	M	Any component of REO User Interface recorded within <i>SAISE Admin</i> shall contain data on statuses via which the managed data can go through, the route transitions of component statuses (configuration of workflow status).
FR 12.18.	M	<i>The REO shall be able to define through SAISE Admin the authorisations related to actions (actions) available to Users with access to User Interface components. The following action categories available to Users will be configured:</i> <ul style="list-style-type: none"> ■ view records; ■ add records; ■ change records; ■ delete records; ■ other relevant actions.
FR 12.19.	M	The IT System shall enable configuring the logging strategy for <i>actions</i> generated by each component of User Interface (use of <i>SAISE Admin</i> logging mechanism, <i>MLog</i> or both at the same time).

5.1.13. UC13: Manage Flows, Forms and Templates

The functional requirements set out for the component used to configure workflows, electronic forms intended for inserting the data and document templates to be populated with data and generated by the *REO* are delineated in Table 5.13.

Table 5.13. Functional requirements of UC13

Identifier	Binding level	Description of Functional Requirements
FR 13.01.	M	<i>The REO</i> shall use the mechanism for resource management provided by <i>SAISE Admin</i> to configure workflows and define the rules for their processing for all scenarios related to electronic form preparation and processing associated with the registration of electoral officials' specific actions.
FR 13.02.	M	The workflows shall be defined by specifying the statuses an electronic form may go through and the processing steps (stages or workflow development stages carried out by Users assigned with specific roles).
FR 13.03.	M	A workflow shall be implemented as a collection of activities through which a prepared electronic form goes through under the business processes carried out in a sequence.
FR 13.04.	M	The number of steps to be included in a flow shall not be limited. In this way the IT solution could be adaptable to the changes of work methodology with documents processed under the management procedure of electoral official profiles or preparation of elections (allocation of electoral officials to elections).
FR 13.05.	M	A workflow should have associated a Coordinator (Supervisor). The Coordinator shall be able to receive warning messages (notifications) generated when rolling the corresponding flow. The User who launches a form for processing through a workflow shall be able to specify who the flow Supervisor is.
FR 13.06.	D	<i>The REO</i> shall provide a mechanism to configure the electronic forms necessary to prepare the documents related to the management of electoral official profiles and allocation of electoral officials to elections (statuses and transitions thereof) and their versioning.
FR 13.07.	M	<i>The REO</i> shall provide mechanisms to configure document (and report) templates related to the documents generated on the basis of prepared electronic forms (the templates shall have a well-defined structure allowing to modify the appearance and content of the retrieved document).
FR 13.08.	M	The Developer shall configure and implement electronic forms and templates to generate the entirety of documents specific for the <i>REO</i> business processes: <ul style="list-style-type: none"> ■ Form to record an electoral official in <i>the REO</i>; ■ Form to update the recorded data of the electoral official; ■ Form to strike off the electoral official; ■ Form to plan training courses; ■ Form to configure the training course; ■ Form to enrol an electoral official into training courses; ■ Form to record the training results of the electoral official; ■ Form to assign an electoral official to elections; ■ Form to withdraw the electoral official from the position assigned during elections.

5.1.14. UC14. Manage Metadata

The functional requirements necessary to manage *the REO* metadata are displayed in Table 5.14.

Table 5.14. Functional requirements of UC14.

Identifier	Binding level	Description of Functional Requirements
FR 14.01.	M	<i>The REO</i> shall have a mechanism to manage nomenclatures, classifiers comprising the metadata intended for configuring the System and managing the <i>REO</i> business processes.
FR 14.02.	M	Where appropriate, classifiers managed by <i>the National Bureau of Statistics (CUATM, CFOJ, CFP, etc.)</i> shall be acquired in full, as well as other official classifiers managed by the Moldovan Central and Local Public Authorities.
FR 14.03.	M	The rights to carry out changes in the official classifiers shall be limited. Changes shall be made for this category of classifiers only when they are made by the CPA that manages them.
FR 14.04.	M	For the system of nomenclatures and internal metadata, the IT solution shall deliver a mechanism for their dynamic definition and administration.
FR 14.05.	M	<i>The REO</i> shall not allow deleting any category of metadata if they are used at least in on DB entry.
FR 14.06.	M	<i>The REO</i> shall be capable to reuse the system of metadata managed through <i>SAISE Admin</i> , which comprises: <ul style="list-style-type: none"> ■ REO system configurations; ■ parameters and constants necessary for <i>REO</i> operation; ■ configurations of external services accessed by <i>REO</i>; ■ official nomenclatures and classifiers of the Republic of Moldova (<i>CUATM, CFP, CFOJ, etc.</i>); ■ nomenclatures and classifiers of <i>SRV</i>; ■ nomenclatures and classifiers <i>e-Learning</i>; ■ other categories of global metadata reused by <i>SAISE</i> applications.
FR 14.17	M	There shall be the possibility to enter the values of <i>REO</i> nomenclatures and classifiers in Romanian and Russian.
FR 14.18	M	<i>The REO</i> shall provide functionality for versioning the metadata values, which shall grant the possibility to specify the calendar period during which the value is valid (to be taken into account when inserting the data, viewing the data and generating the reports).

5.1.15. UC15: Other Administration Activities

The functional requirements set out for *REO* administration activities are displayed in Table 5.15.

Table 5.15. Functional requirements of UC15.

Identifier	Binding level	Description of Functional Requirements
FR 15.01.	M	<i>The REO</i> shall allow the administrative roles to acquire, display and reconfigure the System operation parameters and settings.
FR 15.02.	M	<i>The REO</i> shall allow the Users assigned with <i>Administrator</i> role to configure the access to WEB services provided by external IT Systems the <i>REO</i> interacts with.
FR 15.03.	M	<i>The Administrator</i> shall manage <i>the REO</i> mainly through the mechanisms

Identifier	Binding level	Description of Functional Requirements
		provided by <i>SAISE Admin</i> .
FR 15.04.	M	<i>The Administrator</i> shall access and review the <i>REO</i> system logging events, including through the mechanisms provided by <i>SAISE Admin</i> .
FR 15.05.	M	<i>The Administrator</i> shall monitor <i>the REO</i> functionality, including through the mechanisms provided by <i>SAISE Admin</i> .
FR 15.06.	M	<i>The Administrator</i> shall be able to generate <i>REO</i> back-ups and restore the system functionality based on those back-ups.
FR 15.07.	M	The IT System shall provide the <i>REO Administrator</i> with all the functionalities necessary to ensure smooth operation of the IT solution.

5.1.16. UC16: Synchronise Data

The functional requirements set out for the synchronisation procedures of *REO* database with the DB of external IT Systems are displayed in Table 5.16.

Table 5.16. Functional requirements of UC16

Identifier	Binding level	Description of Functional Requirements
FR 16.01.	M	<i>The REO</i> shall use and expose external services with the Moldovan CPA and state institution external systems, as well as with CEC IT Systems.
FR 16.02.	M	<i>The REO</i> shall carry out synchronisation actions with the <i>SRV</i> to retrieve/update the identification and residence/domicile data of electoral officials.
FR 16.03.	M	<i>The REO</i> shall carry out synchronisation actions with <i>SRLE</i> to retrieve/update the registration data of <i>subjects</i> where electoral competitors work, of political parties, NGOs, etc., which have electoral officials.
FR 16.04.	M	<i>The REO</i> shall carry out synchronisation actions with the IT System <i>e-Learning</i> to retrieve data on electoral officials' training .
FR 16.05.	M	<i>The REO</i> shall carry out synchronisation actions with <i>SAISE Admin</i> to get access to CEC platform services (authentication, authorisation, logging, etc.), shared metadata of <i>SAISE</i> subsystems and relevant data provided by <i>SAISE</i> subsystems.
FR 16.06.	M	<i>The REO</i> shall carry out synchronisation actions with the platform for the generation of CEC reports to retrieve configured analytical and statistic reports.
FR 16.07.	M	<i>The REO</i> shall carry out synchronisation actions with <i>SAISE ITSS</i> in order to furnish data on the appointment of electoral officials to elections.
FR 16.08.	M	All synchronisation events and, in particular, those aimed at accessing personal data through the procedures described by functional requirements FR 16.02 - FR 16.07 shall be logged.

5.1.17. UC17: Perform Automatic Actions

The functional requirements set out for automatic processing of some transaction categories on electoral officials are mirrored in Table 5.17.

Table 5.17. Functional requirements of UC17

Identifier	Binding level	Description of Functional Requirements
FR 17.01	M	<i>The REO</i> shall review on a daily basis all transactions related to the update of Voters' identity data received from <i>SRP</i> . When receiving information on the changes in identity data, residence/domicile, ID documents, etc. related to electoral officials, <i>the REO</i> shall fill in the relevant form and perform automatic update.
FR 17.02	M	<i>The REO</i> shall review on a daily basis all transactions related to the update of Voters' identity data received from SRP . When receiving information about the death of any electoral official, <i>the REO</i> shall fill in the relevant form and strike off automatically the deceased electoral officials.
FR 17.03	M	When new information appears on trainings recorded in the IT System <i>e-Learning</i> , <i>the REO</i> shall fill in the relevant form and record automatically the trainings of relevant electoral officials.
FR 17.04	M	<i>The REO</i> shall check, create or update automatically the profile data of subjects that appoint/designate electoral competitors when reviewing data in the forms containing information on those subjects.
FR 17.05	M	The transactions processed through FR 17.01-FR 17.04 do not require approval from the decision-makers through UC06.
FR 17.06	M	<i>The REO</i> shall prepare and send a daily report to the <i>System Administrator</i> on the updates operated through FR 17.01-FR 17.04.
FR 17.07	M	All the automatic update actions shall be logged.

5.1.18. UC18: Send Notifications

The functional requirements set out for the notification component of *REO* Users are displayed in Table 5.18.

Table 5.18. Functional requirements of UC18

Identifier	Binding level	Description of Functional Requirements
FR 18.01	M	Notification of <i>REO</i> Users shall be done via the WEB platform service of CEC interoperability framework provided by <i>SAISE Admin</i> .
FR 18.02	M	Depending on the User (data for configuring his/her profile), the WEB notification service shall apply one out of three notification strategies: <ul style="list-style-type: none"> ■ notification via Email; ■ notification on the Dashboard application for Users; ■ both categories mentioned above.
FR 18.03	M	Depending on the <i>REO</i> configuration resources within <i>SAISE Admin</i> , the WEB notification service shall send a notification to relevant Users when a transition occurs within the IT application.
FR 18.04	M	The notification shall contain reference for accessing the relevant resource/form, which business event generated the notification (valid for the notifications stored in the User's Dashboard).
FR 18.05	M	The notification shall contain, where appropriate, hypertext reference, based on which it would be possible to access the form/record, which generated the notification.
FR 18.06	D	<i>The REO</i> shall notify <i>the Administrator</i> about any issues, which affect the IT System performance and availability.

5.1.19. UC19: Logging Events

The functional requirements set out for the logging component of *actions* produced within the *REO* workflows are mirrored in Table 5.19.

Table 5.19. Functional requirements of UC19

Identifier	Binding level	Description of Functional Requirements
FR 19.01	M	The logging of <i>actions</i> produced during the <i>REO</i> operation shall be done through the WEB platform service of CEC interoperability framework provided by <i>SAISE Admin</i> .
FR 19.02	M	The following categories of events shall be logged: <ul style="list-style-type: none"> ■ User authentication; ■ User logout; ■ Add/modify/delete/access a record; ■ Prepare an electronic form related to <i>REO</i> specific <i>actions</i> (add official, update the official' profile data, strike off the official, training result of an official, assign an official to elections, access personal data, etc.); ■ Approve/reject a business event form of an electoral official; ■ Generate/access a report; ■ DB query; ■ Other specific <i>actions</i>.
FR 19.03	M	The logged events shall save the following categories of data (depending on the nature of the logged event): <ul style="list-style-type: none"> ■ <i>REO</i> identifier <i>in SAISE Admin</i>; ■ identifier of the User who generated the event; ■ category of the logged event; ■ the time of event logging; ■ <i>REO</i> resource that generated the <i>actions</i>; ■ the record affected by the <i>actions</i>; ■ the action undertaken by the User.
FR 19.04	M	<i>The REO</i> shall log exhaustively all <i>actions</i> that have occurred.
FR 19.05	M	In parallel, <i>the REO</i> shall log alternatively through <i>MLog</i> service the critical <i>actions</i> for which such logging strategy has been configured in the IT Subsystem resources.

5.2. IT System Non-functional Requirements

This Section of the Terms of Reference shall set the requirements towards non-functional characteristics the *REO* shall have. The IT solution, which is the subject-matter of this procurement, shall match the non-functional requirements outlined below.

5.2.1. General and Performance Requirements

General system and performance requirements are defined in the policies and strategies developed and adopted in the Republic of Moldova. It is important to mention that the acts are based on industry best practices and cover many organisational measures, as well as a number of technical measures. The general system requirements specific for *the REO* are displayed in Table 5.20.

Table 5.20. General System Requirements Specific for REO.

Identifier	Binding level	Requirement Description
TGEN 001	M	All User Interfaces and database content shall be prepared in Romanian, using the Romanian diacritical marks.
TGEN 002	M	The User Interface elements shall comply at Level A with the requirements of <i>Web Content Accessibility Guidelines (WCAG) 2.0</i> .
TGEN 003	M	The User Interface shall be optimised for the resolution of 1360x768, having avoided the appearance of scroll bars for User Interfaces displayed by the IT solution.
TGEN 004	M	<i>The REO shall have the possibility to adjust the User Interface (it shall provide a responsive interface) depending on the device used by it (notebook, desktop PC, smartphone, tablet, etc.)</i>
TGEN 005	M	<i>The REO shall ensure compatibility with W3C XForms standard.</i>
TGEN 006	M	<i>The REO shall be optimised within the minimum data transfer between the client computer and server, with the emphasis on the maximum avoidance of redundant requests/queries, implementation of AJAX with JSON, requiring minimum server resources necessary for authentication, authorisation and logging procedures.</i>
TGEN 007	M	<i>The REO architecture shall have at least three levels (with distinctive level for data) and be service-oriented (SOA).</i>
TGEN 008	M	<i>The REO potentially viable information (parameters, data storage methods, connection methods with external services, etc.) shall be configurable and need no solution recompilation or direct intervention in the DB.</i>
TGEN 009	M	<i>The REO shall use open standards for formats and communication protocols.</i>
TGEN 010	M	<i>The services exposed to the public by the REO shall be neutral from the technological stand point (Operating System, Internet Browser, etc.).</i>

The REO specific performance requirements are delineated in Table 5.21.

Table 5.21. Performance requirements set out for the REO.

Identifier	Binding level	Description of Performance Requirements
PERF 001	M	The server average response time shall not exceed 3 seconds upon the nominal system load.
PERF 002	M	The System shall be able to manage up to 150 concurrent Users and serve concomitantly at least 100 queries.
PERF 003	M	All REO performance tests shall be carried out prior to IT solution delivery.
PERF 004	M	Performance testing shall comprise at least two components: <i>load testing</i> and <i>stress testing</i> .

5.2.2. Security and Protection Requirements

The System shall comply with the technical requirements set out for IT Systems imposed by the Moldovan Standard SM ISO/CEI 27002:2014 – Information Technology. Security Techniques. Code of practice for information security controls.

The IT solution shall meet all the Security and Protection Requirements delineated in Table 5.22.

Table 5.22. Security and Protection Requirements set out for the REO.

Identifier	Binding level	Description of Security and Protection Requirements
SR 001	M	The IT System shall guarantee full preservation and integrity of REO DB content.
SR 002	M	Access to the functions offered to non-authenticated Users is controlled with protection means against overburdening the service by one or several network hubs.
SR 003	M	All form fields completed by Users must be validated by type both for the client and for the server.
SR 004	M	The System shall be secured against <i>OWPSA Top 10 vulnerabilities</i> .
SR 005	M	The System shall ensure the confidentiality of data sent-received via communication channels.
SR 006	M	Access to the IT System shall be done in a controlled manner.
SR 007	M	Access to the functions granted to internal Users shall be done via their authentication, using User+Password, <i>Active Directory</i> or electronic or mobile signature.
SR 008	M	The Users' authentication procedures shall be implemented through the facilities provided by SAISE Admin.
SR 009	M	Users' actions shall be recorded in electronic logbooks.
SR 010	M	The System shall deliver a regular signal indicating its operating status.

5.2.3. Requirements for Software, Hardware and Communication Channels

Table 5.23 comprises the requirements set out for REO software, hardware and communication technology.

Table 5.23. Requirements set out for REO software, hardware and communications

Identifier	Binding level	Description of requirements for software, hardware and communication
SHC 001	M	The IT solution shall be developed based on the following platform constraints: <ul style="list-style-type: none"> ■ Windows Server 2012 R2; ■ IIS 8; ■ .NET 4.5, ■ MS SQL Server 2008 Enterprise R2.
SHC 002	M	There shall be the possibility to install the System on both dedicated servers and virtualisation solutions.
SHC 003	M	It is required to demonstrate the virtualisation capacity via the delivery, by the Beneficiary, of a System image, which can be uploaded and become functional with minimum configurations on one of the virtualisation solutions available on the market.
SHC 004	M	The System can be accessed via communication channels of at least 128kbps.
SHC 005	M	The technologies used to develop the <i>SAISE</i> components in place shall be used to build up the IT System.
SHC 006	M	The System is capable to be virtualised at the software-hardware level.

Identifier	Binding level	Description of requirements for software, hardware and communication
SHC 007	M	The System shall be tolerant to errors, having provided support for clustering and fail over for the whole platform and the components thereof.
SHC 008	M	It is necessary that the service parts exposed to the public are neutral from the technological standpoint.
SHC 009	M	Verification shall be done by using a set of (advanced) platforms, so that the performance parameters are similar or even better relative to the reference configuration.
SHC 010	M	The generic software recommended for operation and interaction with <i>the REO</i> represents the WEB browser.
SHC 011	M	The System shall be compatible with at least two of the widely used WEB browsers: <i>MS Internet Explorer/MS Edge, Mozilla Firefox, Google Chrome, Safari and Opera.</i>
SHC 012	M	Compatibility with WEB browser <i>MS Internet Explorer/MS Edge</i> is mandatory.
SHC 013	D	<i>The REO</i> shall incorporate a service Heart-beat, which would periodically communicate the system regular working condition.
SHC 014	M	The System shall include configurable means of technical logging.
SHC 015	M	The System shall be capable to produce at least the following levels of technical logging: <i>info; warning; critical; error.</i>
SHC 016	M	The Developer shall list the means to be used upon system technical troubleshooting.
SHC 017	M	The Developer shall prepare means, which facilitate system administration functions: <ul style="list-style-type: none"> ■ Start the System components; ■ Stop the System components; ■ Restart the System components; ■ Establish a DB back-up, ■ Restore the data based on the stated DB back-up; ■ Upgrade the System operational memory.
SHC 018	M	The System shall operate TCP/IP networks and, in particular, HTTPS.
SHC 019	M	The Developer shall suggest other network and commercial services necessary to operate the system.

5.2.4. Data Migration Requirements

The Developer is to carry out data migration, as well as DB patches in production with the aim to ensure its compatibility with the managed new information objects. The data migration requirements are displayed in Table 5.24.

Table 5.24. Data Migration Requirements.

Identifier	Binding level	Description of the Accepted Initiative
MIGR 001	M	The Developer shall devise the data migration approach/method from the current IT solution, which is used to manage the data related to electoral officials.

Identifier	Binding level	Description of the Accepted Initiative
MIGR 002	M	The category of migrated data may comprise: <ul style="list-style-type: none"> ■ Nomenclatures; ■ Classifiers; ■ Elections; ■ Electoral officials' profiles; ■ Profiles of subjects appointing/designating electoral officials; ■ Data regarding the trainings of electoral officials; ■ Data on electoral officials' engagement in elections.
MIGR 003	M	In the data migration process, <i>the Developer</i> shall be responsible for: <ul style="list-style-type: none"> ■ setting the methodology applicable for data migration; ■ devising detailed plans for data migration; ■ ensuring software tools to be used for data migration; ■ setting the quality rules for preparing the data sets for migration and implementing them at the level of tools used in the process; ■ mapping the data made available by <i>CEC</i> to <i>REO</i> data structures; ■ setting the data reconciliation criteria; ■ participating in data cleaning and enriching activities; ■ verifying and validating the quality of data sets for import; ■ importing the prepared data; ■ identifying the exemptions and errors during the import of data.
MIGR 004	M	<i>The Developer</i> shall prepare detailed plans of data population and propose them to <i>CEC</i> .
MIGR 005	D	<i>The Developer</i> shall ensure software specialised tools, such as ETL (<i>Extract Transform Load</i>) to be used in the process of data migration and shall provide full documentation for the use of those tools, ensuring the training of responsible people from <i>CEC</i> , in order to use the corresponding tools.
MIGR 006	M	In the process of data population, <i>the Developer</i> shall commit to adhere to the security policy and standards approved and applied by <i>CEC</i> .
MIGR 007	M	All relevant data sets held by <i>CEC</i> shall be migrated completely and correctly to <i>the REO</i> .

5.2.5. Aspects related to IT and Industry Initiatives

The requirements set out for the aspects related to the used IT and relevant industry initiatives currently in force in Moldova are delineated in Table 5.25.

Table 5.25. Requirements related to the IT and Industry Initiative aspects

Identifier	Binding level	Description of Accepted Initiative
INI 001.	M	<i>The REO</i> shall use as authentication mechanism the <i>MPass</i> service of the government interoperability framework intended for authentication through electronic or mobile signature and the authentication service of <i>CEC</i> interoperability framework provided by <i>SAISE Admin</i> .
INI 002.	M	<i>The REO</i> shall use as authorisation mechanism the authorisation service of <i>CEC</i> interoperability framework provided by <i>SAISE Admin</i> .
INI 003.	M	<i>The REO</i> shall use <i>MSign</i> platform service as a mechanism to affix and validate the electronic signature.
INI 004.	M	<i>The REO</i> shall use interoperability platform <i>MConnect</i> as a mechanism to

Identifier	Binding level	Description of Accepted Initiative
		interact with IT Systems of other Moldovan authorities.
INI 005.	M	<i>The REO shall incorporate as logging mechanism for critical events MLog platform service and logging service provided by SAISE Admin.</i>

5.2.6. IT System Documentation Requirements

The IT Solution shall be accompanied by a full set of IT System documentation, which comprises the sections included in Table 5.26.

Table 5.26. REO Documentation Requirement.

Identifier	Binding level	Description of REO Documentation Requirement
DOC 001	M	The Developer shall prepare and publish Interactive Guiding Materials included in the <i>REO</i> User Interface.
DOC 002	M	The Developer shall prepare and deliver the IT System Technical Design (SRS+SDD).
DOC 003	M	The Developer shall prepare and deliver User's Manual in Romanian and Russian.
DOC 004	M	The Developer shall prepare and deliver Administrator's Manual in Romanian.
DOC 005	M	The Developer shall prepare REO Testing Scenarios intended for pre-acceptance and final acceptance.
DOC 006	M	The Developer shall prepare and deliver the REO Installation and Configuration Guide (which would comprise at least guidelines on code compilation, application installation, hardware and software requirements, platform description and configuration, application configuration, procedures for recovery in case of disaster).
DOC 007	M	The Developer shall prepare and deliver REO Architecture Documentation with the sample description in UML, which would include a sufficient level of detail in terms of architecture in several blocks (including the logical and physical data sample).
DOC 008	M	The Developer shall prepare and deliver API Documentation exposed for integration with other IT Systems.
DOC 009	M	The Developer shall provide all electronic means necessary to describe and validate the interfaces in WSDL.
DOC 010	M	The Developer shall provide the source-code for the applications and components developed within the project.

5.2.7. IT System Maintenance Service

The Developer shall ensure post-delivery warranty and technical support as per the Sections included in Table 5.27.

Table 5.27. REO Warranty and Technical Support Requirements.

Identifier	Binding level	Description of Warranty and Technical Support Requirements
GMS 001	M	The Developer shall provide a 12-month warranty and technical support following the IT System acceptance.

Identifier	Binding level	Description of Warranty and Technical Support Requirements
GMS 002	M	The warranty and technical support shall be compliant with the National Standard <i>SM ISO/CEI 14764:2015 – Software Engineering. Software Life Cycle Processes. Maintenance.</i>
GMS 003	M	The Beneficiary would be able to flag the occurred technical issues via ticketing, Email or instant messages.
GMS 004	M	The Developer shall ensure support aimed to document the technical issues and their traceability for the Beneficiary.
GMS 005	M	The deadline for responding and remedying the reported technical issues shall not exceed eight working hours following their reporting.
GMS 006	M	In case of complex issues, the period for their resolution shall not exceed 72 hours.
GMS 007	M	The Developer shall demonstrate the capacity to ensure post-delivery technical support according to GMS 001-GMS 006 Requirements.
GMS 008	M	Upon the signature of REO final acceptance acts, the Developer shall sign a SLA with the CEC, specifying the mechanism for a 12-month warranty, technical support and maintenance.

6. Final Output and Delivered Components

The final product (*the REO*) is composed of software artefacts and system documentation, as well as of knowledge transfer to the system Possessor and Administrator. Artefacts related to the *REO* deliverables are displayed in Table 6.1.

Table 6.1. Artefacts delivered for the Register of Electoral Officials.

Identifier	Binding level	Artefact Brief Description
DELIV 001	M	Complete source-code of modules and components necessary to compile the delivered software.
DELIV 002	M	Final product packed for easy installation in the proposed technological environment.
DELIV 003	M	Technical design (SRS+SDD).
DELIV 004	M	Document on system configuring and deployment (guidelines for deployment).
DELIV 005	M	User's Manual.
DELIV 006	M	Administrator's Manual (including a contingency plan).
DELIV 007	M	Training documentation (intended for trainers who would train the staff in operating the IT solution).
DELIV 008	M	Scenarios of pre-acceptance and final acceptance tests.
DELIV 009	M	Technical specifications for the published and used interfaces.
DELIV 010	M	SLA to render post-implementation warranty, maintenance and technical support services.
DELIV 011	M	Totality of artefacts copied on electronic medium (CD-R or DVD+-R).

Besides the artefacts related to *REO* deliverables, all the services necessary for the knowledge transfer displayed in Table 6.2 will be provided.

Table 6.2. Knowledge transfer services related to delivered artefacts.

Identifier	Binding level	Artefact Brief Description
DELIV 012	M	Training of Users and Administrators (two system Users assigned with the role of <i>Administrator</i> , 40 system Users assigned with the role <i>REO Registrar</i>).
DELIV 013	M	Assistance during the system pilot testing period.
DELIV 014	M	Assistance in testing the system acceptance.
DELIV 015	M	Assistance in system release to service.
DELIV 016	M	Solving the deficiencies identified during the pilot period and acceptance testing.
DELIV 017	M	Post-implementation technical support (after the system release to service) for a 12-month period, including corrective, adaptive and preventive maintenance, in compliance with SM ISO/CEI 14764:2015.

7. IT System Implementation Stages

The designing, building, testing and implementation of *REO* must be done in compliance with the following schedule:

1. *REO* development stage, which shall be subdivided into the phases coordinated with the CEC as follows:
 - a. The Developer proceeds with analysing the Terms of Reference, Scope of Work and with due approval of the direct Beneficiary (CEC) proposes its vision with regards to developing the IT System bearing on a technical design composed of two documents: SRS and SDD (one month);
 - b. The Developer proceeds with developing a programme code and integrating the modules developed into a prototype version of the IT Subsystem (the first presentation to the parties shall demonstrate the existence of all functionalities described in the technical specification), which subsequently will be improved until the signature of the IT Subsystem final acceptance. The stage in question shall not exceed five months;
 - c. The Developer proceeds with testing the IT Subsystem in laboratory mode (in-house testing) and prepares the accompanying documentation (presented shall be the functionalities of the system completed with corrections and adjustments made during the previous sub-stage; also presented shall be a set of technical documentation, etc.). The duration of the stage in question shall be two weeks. The testing shall cover the following stages:
 - o applied to the system by the third party shall be stress and load testing scenarios with the purpose to **check the level of its compliance with the CEC's expectations**;
 - o the Developer shall obtain the results of *load and stress testing* based on which it shall introduce, where appropriate, all required adjustments and changes; thus, having prepared an improved version of the software product;
 - o applied by the third party to the improved version of the Subsystem shall be *stress and load testing* scenarios with the view of checking its compliance with **CEC's** expectations. Where appropriate, direct improvements shall apply until all of the traced out issues are cleared.
2. *REO* Implementation Stage shall begin with the approval of the Acceptance Protocol by CEC in the submitted version and signing the statement of delivery-acceptance in experimental operation. Implementation of the IT solution (shall last two months at most).
3. Training stage shall start concomitantly with the implementation of the IT solution and cover the training of two system Users assigned to act as *System Administrators*, 40 system Users assigned to act as *REO Registrars* from CICDE, EMD and Political Parties.
4. *REO* release to service/commissioning begins with the signature of the IT System Commissioning Statement, and its operation is started.
5. *REO* Warranty and Maintenance Stage is the period during which the system Developer is assuming the obligation relative to the CEC to grant the assistance in maintaining the capacity of the IT Subsystem to provide services, as well as in upgrading the software, while maintaining its integrity. This stage could take as long as possible depending on the contractual provisions agreed on by the Parties. In case of *REO* we believe that an initial 12-month period shall be sufficient.

Annex 1. Reports on Skills and Trainings provided to Electoral Officials

Table A1.1. Test appraisal performance of district participants, including from the gender perspective.

No.	District	Coordinator	Subject	Participants	Admitted	Rejected	Of which women	Of which men

Table A1.2. Number of women and men by each subject

Subject	Percentage ratio		Numerical ratio		
	Women	Men	Women	Men	Total
Subject 1					
...
Subject N					
TOTAL					

Table A1.3. Numerical table of people appointed for training by subject and district.

Ref.#	District	Subject1	Subject 2	Subject 3	...	Subject N
					...	
					...	
					...	
TOTAL						

Table A1.4. Percentage and numerical analysis of the share of trained women and men by administrative and territorial units.

No. d/o	District	Women %	Men %	Women	Men	Total
TOTAL						

Table A1.5. Percentage and numerical analysis of certified and non-certified officials by administrative and territorial units.

No. d/o	District	Certified %	Non-certified %	Certified	Non-certified	Total
TOTAL						

Table A1.6. Analysis of data on trained people by education by administrative and territorial units

Ref.#	District	Higher education %	Secondary specialised education %	Secondary vocational education %	Secondary general education %	School student %
TOTAL						

Table A1.7. Analysis of data on trained people by profession by administrative and territorial units.

Ref.#	District	Profession 1 %	Profession 2 %	Profession 3 %	... %	Profession N %
TOTAL						

Table A1.8. Analysis of data on trained people by spoken languages.

Ref.#	Spoken language	Number	Share %

Table A1.9. Analysis of data on trained people by their gained experience in elections by administrative and territorial units.

Ref.#	District	never %	once %	twice %	three times and more %

TOTAL					

Table A1.10. Analysis of data on trained people by the position held by administrative and territorial units.

Ref.#	District	Position 1 %	Position 2 %	Position 3 %	... %	Position M %
TOTAL						

Table A1.11. Analysis of data on people trained after the elections they participated in.

Ref.#	Elections	Number	Share %

Table A1.12. Analysis of data on trained people by age and by administrative and territorial units.

Ref.#	District	Up to 18 years old %	18-25 years old %	26-45 years old %	Over 45 years old %
	TOTAL				

Table A1.13. Report on issued certificates.

Ref.#	Certificate Number	Last Name	First Name	Date of issuance	Date of expiry
TOTAL					