TERMS OF REFERENCE

for developing the SAISE IT Subsystem "Electronic Subscription List"

Owner: Division of Information Technology and Management of Voters' Lists, Central Electoral Commission

Chisinau 2022

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Introduction

"Enhancing democracy in Moldova through inclusive and transparent elections" (EDMITE Project) is a project that sets its overall goal to achieve an enhanced transparency and inclusiveness of the electoral process in Moldova through a modernized IT system, improved legislation and intensified public participation, addressing the root causes of the current challenges hampering the further development of the democracy and the advancement of the electoral process in the Republic of Moldova.

One of the Project aims is to contribute to: (1) achieving a more accurate State Register of Voters (SRV), improving the quality and accessibility data by re-engineering the Civil Status Service (CSS) systems, fully developing the State Address Register and facilitating data exchange and interoperability between different central public institutions via governmental platform for data exchange MConnect; and (2) enhancing the inclusiveness of the electoral process through developing a remote voting tool and adjusting the State Automated Information System "Elections" (SAISE) to keep up with the technical and political developments.

The current version of SAISE contains around 8 inter-related IT applications/modules meant to ensure transparency, accuracy and trust in the electoral process. Most of the SAISE modules have been designed and developed, under the leadership of the Central Electoral Commission (CEC) and with the previous support of UNDP, in the period 2014 – 2017.

The Moldovan legal framework in force does not expressly stipulate the need to develop an IT System intended to collect signatures of Moldovan citizens on Subscription Lists in support of candidates or of referenda organised exclusively online. As a result, signatures are collected on paper followed by a digitisation procedure within the CEC, which involves the manual input of the content of subscription lists received by CEC into the "Subscription Lists" IT Subsystem to check the accuracy of collected data and validate it.

Thus, this work implies substantial efforts on the CEC side and extensive time spent on checking and validating the Subscription Lists and makes the participation of Moldovan citizens in such democratic exercises (the signatures collection in favour of candidates or referenda) cumbersome.

Given the option of electronic signatures, available through mobile devices, electronic ID cards and specialised devices supplied by the certifying authorities, and the existing legal framework that would allow and enable the collection of signatures through electronic means, it is considered reasonable and appropriate to implement such an IT Subsystem under SAISE, namely the "Electronic Subscription List" IT Subsystem ("ESL" ITSS).

The "ESL" ITSS is expected to automate the business processes related to the collection of voters' signatures necessary to initiate referenda or nominate candidates for local, parliamentary and presidential elections. To this end, the IT solution shall provide the following functionalities:

- Initiate the Subscription Lists available online (to be signed using electronic/mobile signatures) for referenda and local, parliamentary and presidential elections;
- Collect online signatures for the Electronic Subscription Lists;
- Send automatically the Subscription Lists collected online to the "Subscription Lists" ITSS;
- Generate statistical reports and documents specific for the process of signature collection through Subscription Lists and other relevant actions.

The "ESL" ITSS implementation is set to automate the processes set up by the regulatory framework currently in force (Electoral Code of the Republic of Moldova, adopted by Law No. 1381 of 21.11.1997, Law No. 101 of 15.05.2008 on the Concept of the SAISE, and CEC Decision No. 1730 of 03.07.2018 approving the Regulation on the manner of preparing, presenting and checking the Subscription Lists) by bringing a cutting-edge IT toolkit in line with the latest trends in implementing e-Governance solutions. It is set to reduce the time spent on checking the accuracy of Subscription List data by means of implementing certain procedure to synchronise the information supplied by the State Register of Voters

(SRV) and ensure the authenticity of signatures via cryptographic algorithms used for digital and mobile signatures. The electronically signed document, pursuant to the legislation in force, shall have the same value as the one with a handwritten signature, but at the same time will be much harder to falsify than handwritten signatures.

This Document is intended to develop and implement the "Electronic Subscription List" IT Subsystem and conceptualizes/defines the IT solution objectives, tasks and functions, the organisational structure and regulatory and legislative constraints, the functional and non-functional requirements necessary for the IT System development and operation, as well as expected duration of the contract/assignment and professional qualifications of the successful contractor and its key personnel.

1. General Information

"ESL" ITSS represents an IT solution identified to have immediate benefits and impact on the Central Electoral Commission (CEC) work. It is an IT solution focused mainly on covering the IT and information needs of all actors involved in the State Automated Information System "Elections" (SAISE) operation.

"ESL" ITSS is a SAISE component, representing an uncoupled module from the programmatic point of view, which implements alternative facilities aimed to collect Subscription Lists accessible to Diaspora citizens as well.

1.1. Notions used in Technical Specifications

The Acronyms and Abbreviations used in this Document are defined in Table 1.1.

Table 1.1. Acronyms and Abbreviations used in this Document.

No.	Abbreviation /Acronym	Description
1.	API	Application Programming Interface
2.	DB	Database
3.	CEC	Central Electoral Commission
4.	EMD	CEC Elections Management Division
5.	IG	Initiative Group
6.	KPIs	Key Performance Indicators
7.	ESL	Electronic Subscription List
8.	PP	Political Party
9.	SDD	Software Design Document
10.	DBMS	Database Management System
11.	ITS	IT System
12.	SAISE	State Automated Information System "Elections"
13.	SRS	Software Requirements Specification
14.	SLA	Service Level Agreement
15.	ITSS	IT Subsystem
16.	IT	Information Technology
17.	ICT	Information and Communications Technology
18.	TLS/SSL	Transport Layer Security/Secure Sockets Layer. The TSL Protocol or its predecessor, the SSL Protocol, are cryptographic protocols that ensure safe communication between two computer network hubs for such actions as visiting Web pages, e-mail, Internet-fax, exchange of instant messages and other transfers of data.

The definitions of notions/terms frequently used in this Document are displayed and explained in Table 1.2.

Table 1.2. Definitions of Notions/Terms used in this Document.

No.	Abbreviation/Acronym	Description
1.	Database	A collection of data organized as per the design structure describing the basic characteristics and relation amongst entities.
2.	Credentials	A set of symbols establishing the Users' and systems identity and authentication within information systems.
3.	Data	Elementary information units about people, subjects, facts, events, phenomena, processes, objects, situations, etc. presented in a way that enables their notification, commenting and processing.
4.	Personal Data	Any information referring to an identified or identifiable natural person (subject of personal data). To this end, an identifiable person is the one who can be identified, directly or indirectly, in particular, through referring to an identification number or to one or more specific elements describing the person physical, physiological, psychical, economic, cultural or social identity.
5.	Data Integrity	Data status when they maintain their content and are interpreted unambiguously in cases of random actions. It is deemed that the data maintained their integrity if they have not been altered or deteriorated (deleted).
6.	Logging	A function of recording the information on events. The records about events entered into the information systems include details about the date and time, User, and action carried out.
7.	Subscription List	A list containing voters' signatures who support a certain candidate in elections or initiate a Referendum;
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 material and non-material entities.
10.	Information resource	Set of documentary information in the computer system maintained as per the requirements and legislation in force.
11.	IT system	All software and hardware that ensure automatic data processing (the information system automated component).
12.	Information system	A system for information processing along with the associated organizational resources such as human and technical resources, which provides and disseminates the information.
13.	"ESL" ITSS	IT Subsystem intended to digitise the subscription list filling processes intended to support candidates in elections or initiate referenda.
14.	Software design document	IT System guiding document covering detailed description of the following approaches: data structures and their constraints, IT System architecture, which provides all its conceptual sections, interface covering the conceptualization of all user interface components, functionalities comprising detailed description of all IT System implementation scenarios.
15.	Software Requirements Specification	Document comprising detailed description of all interaction scenarios between users and the IT application.

No.	Abbreviation/Acronym	Description
16.	IT subsystem	Component (with the possibility of functional separation) of a complex IT system.
17.	Information and Communications Technology	Common term that comprises all technologies used to exchange and handle the information.
18.	Data truthfulness	The extent to which the data stored in the computer memory or in documents correspond to the real status of the system field-related objects mirrored in those data.

1.2. ITSS Development References and Legal Aspects

The processes concerning the "ESL" ITSS creation, implementation and operation shall be compliant with the field-related regulatory and legislative acts in force regarding the CEC work and the development of IT solutions intended for the Moldovan Public Authorities.

This category comprises the following legal and regulatory acts:

1. *The Electoral Code of the Republic of Moldova,* adopted by Law No. 1381 of 21.11.1997, Official Gazette No. 81 of 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. 1730 of 03.07.2018 approving the Regulation on the manner of preparing, presenting and checking the Subscription Lists*, Official Gazette No. 321-332 of 24.08.2018.
4. *Law No. 133 of 08.07.2011 on Personal Data Protection*, Official Gazette No. 171-175 of 14.10.2011.
5. *Government Decision No. 1123 of 14.12.2010 approving the Requirements aimed at ensuring personal data security during their computerised processing,* Official Gazette No. 254-256 of 24.12.2010.
6. *Government Decision No. 7104 of 20.09.2011 approving the Strategic Program for Governance Technology Upgrade (e-Transformation)*, Official Gazette No. 156-159 of 23.09.2011.
7. *Government Decision No. 128 of 20.02.2014 on Common Government Technology Platform (MCloud)*, Official Gazette No. 47-48 of 25.02.2014.
8. *Government Decision No. 656 of 05.09.2012 approving the Programme on Interoperability Framework*, Official Gazette No. 186-189 of 07.09.2012.
9. *Government Decision No. 1090 of 31.12.2013 on Government Electronic Service for Authentication and Access Control (MPass)*, Official Gazette No. 4-8 of 10.01.2014.
10. *Government Decision No. 405 of 02.06.2014 on Government Integrated Electronic Service for Electronic Signature (MSign)*, Official Gazette No. 147-151 of 06.06.2014.
11. *Government Decision No. 708 of 28.08.2014 on Government Electronic Service for Logging (MLog)*, Official Gazette No. 261-267 of 05.09.2014.
12. *Law No. 91 of 29.05.2014 on Electronic Signature and Electronic Document*, Official Gazette No. 174-177 of 04.07.2014.
13. *Government Decision No. 945 of 05.09.2005 on Centres for Certification of Public Keys*, Official Gazette No. 123-125 of 16.09.2005.

14. *Government Decision No. 320 of 28.03.2006 approving the Regulation on Affixing Digital Signatures on Electronic Documents issued by Public Authorities*, Official Gazette No. 51-54 of 31.03.2006.
15. *Law No. 467-XV of 21.11.2003 on Computerisation and State Information Resources*, Official Gazette No. 6-12/44 of 01.01.2004.
16. *Order No. 94 of 17.09.2009 issued by the Ministry of Information Development approving certain Technical Regulations (the way of keeping records of public electronic services, providing public electronic services, ensuring information security while providing public electronic services, determining the cost for developing and implementing automated information systems)*, Official Gazette No. 58-60 of 23.04.2010.
17. *Technical Regulation "Software life-cycle processes" RT 38370656-002:2006*; Official Gazette No. 95-97/335 of 23.06.2006.
18. Other laws, regulatory acts, standards in force in the area of ICT.

To conceptualise and develop the "ESL" ITSS it is appropriate to implement the principles covered by the following international guidelines and recommendations:

- *Standard of the Republic of Moldova MS 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
- *World Wide Web Consortium (W3C) Recommendations (*http://www.w3c.org*)* on the quality of web page content, possibilities to view the accurate information by using the widespread Internet browsers and compatibility with different IT platforms;
- *W3C Recommendations* (http://validator.w3.org) on WEB page testing. All WEB pages generated by the *"ESL" ITSS* shall be tested as per these Recommendations.

1.3. IT System Basic Principles

To ensure the attainment of the objectives set forth for this IT solution full account shall be taken of the following general principles in the process of designing, developing and implementing the "ESL" ITSS:

- **Principle of legality**: implies the creation and operation of IT Subsystems in accordance with the national legislation in force and with the relevant internationally recognized field-related rules and standards;
- **Principle of dividing the architecture by levels**: consists in designing independently the SAISE components ("ESL" ITSS is a SAISE component) according to interface standards between levels;
- **Principle of service-oriented architecture (SOA)**: involves dividing the application functionalities into smaller and distinct units – called services – that can be assigned within a network and can be used together to create new applications to implement the IT System business functions;
- **Principle of reliable data**: provides the input and access of data via authorized and authenticated channels only;
- **Principle of information security**: implies a proper level of integrity, selectivity, accessibility and effectiveness to secure data against losses, alterations, damages and unauthorized access;

- **Principle of transparency**: requires the design and implementation according to the modular principle, using transparent standards of information and telecommunication technologies;
- **Principle of expansibility**: stipulates the possibility of extension and completion of the IT System with new functions or improvement of the ones already in place;
- **Principle of priority of first person/single centre**: implies the existence of a senior person in charge assigned with sufficient rights to take decisions and coordinate the activities to develop and operate the IT Systems;
- **Principle of scalability**: implies the provision of a constant performance of an IT solution upon increased amount of data and IT System stress;
- **Principle of simplicity and convenience of use**: implies the design and implementation of all applications, hardware and software resources available to System users, based on exclusively visual, ergonomic and logical design principles.

In particular, for the IT System architecture the following major principles shall be complied with:

- implementing client-server WEB based solutions with authorised access to interface and data;
- providing appropriate security to protect the information and component subsystems against their unauthorized use or disclosure of personal data or of classified information;
- recognizing the information as a valuable asset and its appropriate management;
- developing and implementing functional components that enable their use for other processes or create opportunities to develop new functionalities (including some of *SAISE* functionalities already in place);
- minimizing the number of various technologies and products that offer the same or similar functionalities as per their purpose (reuse of technologies already implemented by *CEC*);
- ensuring disaster recovery ability (ensuring physical and logical security) as part of the implementation plan.

1.4. IT System Destination, Objectives and Tasks

"ESL" ITSS is set to automate the Subscription List devising processes to initiate referenda or nominate candidates to participate in elections, having computerised the process of signature collection and transmission of data on signatories exclusively through automatic uploading facilities.

This implies extensive use of modern means for collecting accurate data taken up from reliable sources (example: State Register of Voters, MPass Authentication Service) and of decisions to support election candidates or referenda through electronic signatures held by Moldovan citizens.

As a result, the activities related to the initiation of signature collection processes in support of candidates in local, parliamentary and presidential elections and referenda could be carried out alternatively through IT means, and this fact would substantially increase the number of citizens willing to affix their electronic signature of active subscription lists.

"ESL" ITSS implementation would enable CEC to streamline the processes of receiving, checking and validating the Subscription Lists.

"ESL" ITSS development and implementation would enable CEC to attain the following objectives:

- transfer the processes of initiation and implementation of signature collection procedures in favour of candidates or referenda online;
- automate the process of signature collection related to Subscription Lists intended for the initiation of referenda;
- automate the process of signature collection related to Subscription Lists in support of candidates in local, parliamentary and presidential elections;
- implement reliable procedures for checking and delivering to citizens only those Subscription Lists they have the right to sign;
- reduce the CEC labour related to digitisation and checking the Subscription Lists received traditionally in paper;

- provide *CEC* with accurate data from reliable sources, which do not require manual checking procedures;
- actively involve citizens in processes aimed to nominate candidates for local/parliamentary/presidential elections or referenda regardless of their geographical area;
- develop an efficient cooperation mechanism among the actors involved in the process of signature collection for the Subscription Lists;
- ensure control over the access to data and ensure maximum security and confidentiality of data sets and users;
- computerise the industry analysis, forecasting and research activity.

2. IT System Architecture

"ESL" ITSS shall provide a WEB interface to be accessible through widely used web browsers (MS Edge/MS Internet Explorer, Mozilla FireFox, Opera, Google Chrome or Safari). From a functional standpoint, a reliable and scalable solution will be developed for increased number of concurrent users and for increased volumes of information managed by it.

As the "ESL" ITSS is not an isolated IT solution, and it shall interact with other CEC IT subsystems or with external IT solutions, the developed application shall support its integration with other IT subsystems.

"ESL" ITSS shall be based on a client-server architecture with at least three levels (that excludes any direct application-database interaction), based on cutting-edge WEB technologies.

To ensure an appropriate level of information security, the delivered application shall enable secure connections between client stations and application server to ensure safe transmission of information (via VPN channels and TLS/SSL sessions).

The IT solution shall be developed based on the cutting-edge Internet/Intranet technologies. The interaction of all IT System actors and hubs is shown in Figure 2.1.

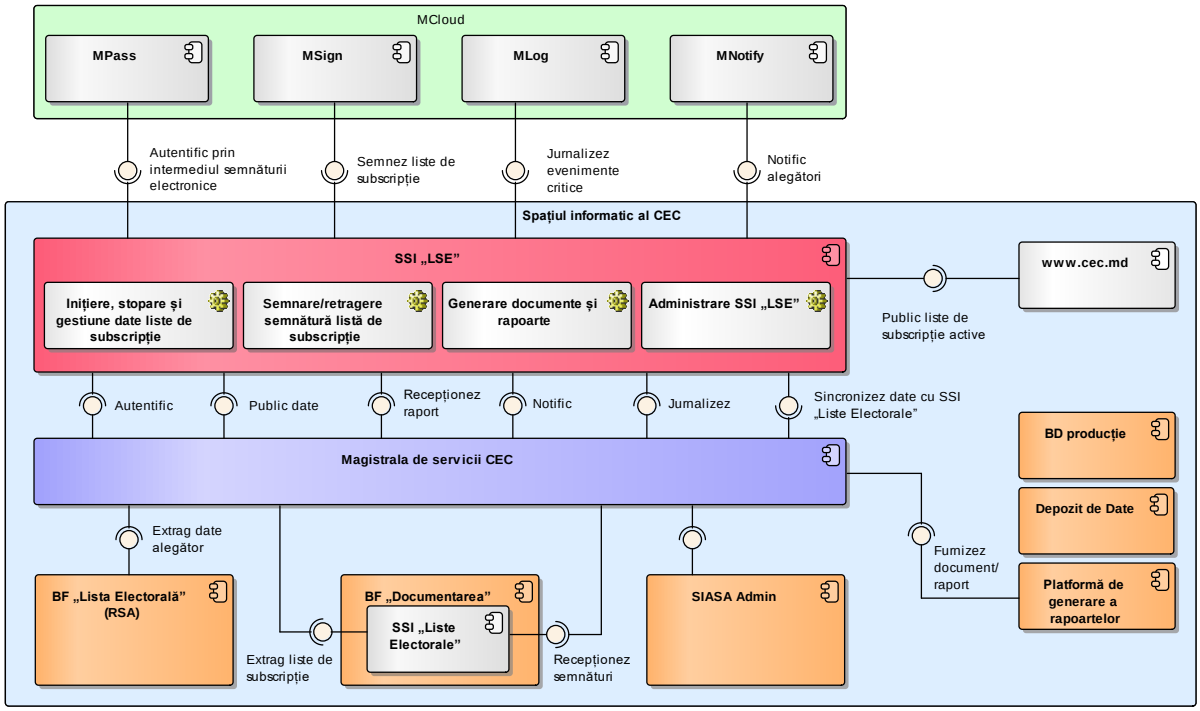

Figure 2.1. "ESL" ITSS Architecture.

As shown in Figure 2.1, the resource pooling solution to ensure the "ESL" ITSS functionality consists of three distinct types of hubs:

- CEC Data Centre – CEC ICT infrastructure that hosts the "ESL" ITSS and has a range of IT solutions installed "ESL" ITSS will interact with. Only the "ESL" ITSS and its integration means with the "Voters' Lists" ITSS will be implemented under these Specifications;
- M-Cloud – the ICT infrastructure of the common government technology platform that makes up the government cloud (MCloud), which hosts a series of IT Systems (MPass, MSign, MLog and MNotify) to be integrated with the "ESL" ITSS;
- Client computers – computers from where Users (depending on their assigned rights and roles) will access the "ESL" ITSS functionalities.

To access and use the "ESL" ITSS, client computers shall use at least two of major web browsers (compatibility with Microsoft Internet Explorer/Microsoft Edge is mandatory) as client application. The interface and functionalities delivered to each User will depend on the User's level, its rights and roles.

Regardless of the User's access level, all connections with the "ESL" ITSS shall be performed exclusively via secure connections (VPN or TLS/SSL).

To implement a number of functionalities, the "ESL" ITSS will use a series of services provided by SAISE ITSSs through the CEC interoperability framework, namely:

1. WEB Service "Authenticate" provided by SAISE Admin with the aim to deliver a universal and centralised authentication mechanism for SAISE Users.
2. WEB Service "Authorise" provided by SAISE Admin with the aim to deliver a universal and centralised authorisation mechanism for Users (providing functionalities and data accessible to them), regardless of the used SAISE application.
3. WEB Service "Notify" provided by SAISE Admin with the aim to implement a universal and centralised notification mechanism for Users, regardless of the used SAISE application.
4. WEB Service "Logging" provided by SAISE Admin with the aim to implement a universal and centralised mechanism for logging the business events generated by the activity of authorised Users under the used SAISE applications.
5. WEB Service "Retrieve Voter's Data" provided by the SAISE Admin FB "Voters' List" (State Register of Voters) with the aim to retrieve identification and residence data of voters who sign the Subscription Lists.
6. WEB Service "Send Document/Report" provided by CEC Reporting Platform demanding statistical reports implemented for "ESL" ITSS.
7. WEB Service "Retrieve Subscription Lists" provided by the "Subscription Lists" ITSS for receiving the parameters of recorded Subscription Lists, for which the electronic signature mechanism is to be implemented under this Project.
8. WEB Service "Receive Signatures" provided by the "Subscription Lists" ITSS to dispatch the data related to Subscription Lists filled and signed online. This Service is to be implemented under this Project.

"ESL" ITSS will interact directly with a number of MCloud platform services as follows:

1. WEB Service "Authenticate via Electronic Signature" that interacts with the government platform service MPass used to implement the authentication procedures of users via Electronic or Mobile Signatures.
2. WEB Service "Sign Subscription Lists" that interacts with the government platform service MSign intended to affix and validate the Electronic Signature, including the Mobile Signature affixed on subscription forms or to remove the subscription.
3. WEB Service "Log Critical Events" that interacts with the government platform service MLog intended to log the "ESL" ITSS sensitive business events.
4. WEB Service "Notify Voters" that interacts with the government platform service MNotify intended to notify the users outside the CEC on "ESL" ITSS business events relevant for them.

In its activity, the "ESL" ITSS will expose one interaction interface with external IT Systems as follows:

1. WEB Service "Active Public Subscription Lists" to interact with the CEC Official WEB page to publish active Subscription Lists.

3. Stakeholders and IT System Roles

3.1 IT System Business Roles

The following entities are interested or shall be involved in the process of "ESL" ITSS development and operation:

- CEC 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 administration and operation of SAISE, including the "ESL" ITSS;
- UNDP "Enhancing Democracy in Moldova through Inclusive and Transparent Elections" (EDMITE) Project as an institution that would finance and monitor the "ESL" ITSS development and implementation activities;
- E-Government Agency as a body empowered to develop and implement the e-Transformation policy, MCloud and MConnect interoperability framework used to enable the "ESL" ITSS interaction with platform services (MPass, MSign, and MLog);
- State-owned Enterprise "Information Technology and Cyber Security Service" as an entity that administers MCloud, which provides platform services implemented under the "ESL" ITSS.

3.2 IT System Possessor

The CEC shall be the IT System Possessor. The role of system Possessor mirrors the administrative matter related to the CEC full competences, which are necessary for IT System continuous administration and development.

As the "ESL" ITSS Possessor, the CEC would be able to assign roles and rights of access to User's interface and data to its employees, depending on their job duties.

3.3 IT System Owner

The CEC shall be the IT solution Owner that would provide the technical infrastructure to host the "ESL" ITSS.

In the long run, the possibility of hosting certain components of "ESL" ITSS outside the CEC Data Centre has to be considered as well. One of such solutions could be the common government platform M-Cloud. This should be done after the appropriate certification of MCloud by the Information and Security Service of the Republic of Moldova.

3.4 IT System Purchaser

The "ESL" ITSS will be purchased by the UNDP "Enhancing Democracy in Moldova through Inclusive and Transparent Elections" (EDMITE) Project on behalf of the CEC. Although CEC is the direct Beneficiary of the IT solution, the Consultants contracted by the UNDP "Enhancing Democracy in Moldova through Inclusive and Transparent Elections" Project will be involved in all "ESL" ITSS development stages, its commissioning and final acceptance.

3.5 IT System Users and their Roles

Human roles or information systems that interact with "ESL" ITSS are displayed in Figure 3.1. As can be seen in this Figure, four categories of human actors and five categories of information systems would be interacting under this application.

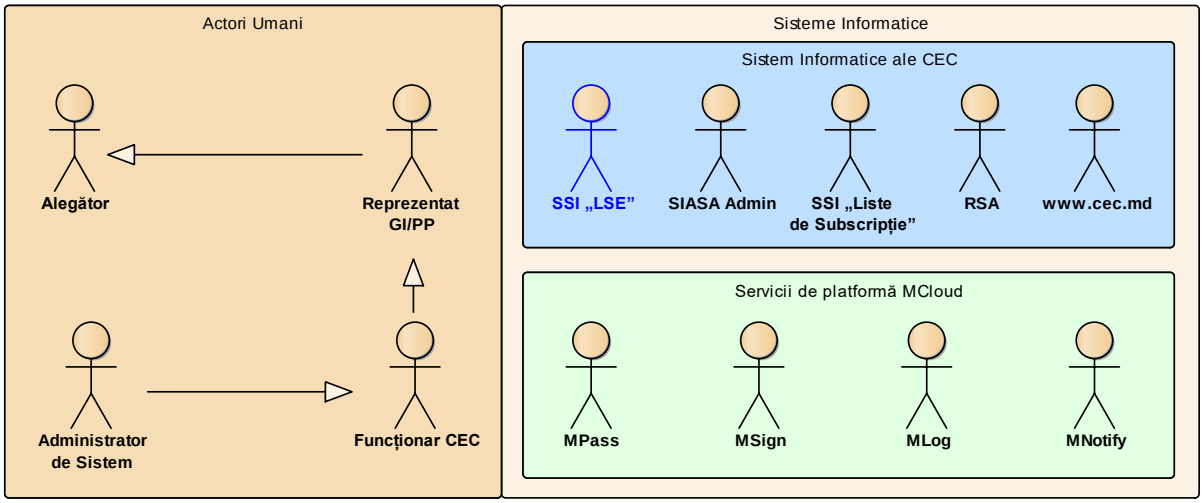

Figure 3.1. "ESL" ITSS Actors.

1. Voter - - represents the role assigned by "ESL" ITSS to citizens with voting rights who shall authenticate themselves in "ESL" ITSS via Electronic or Mobile Signature (using the platform service MPass) to sign Subscription Lists or perform other actions as follows:
    - sign the Subscription Lists submitting questions for referendum;
    - sign the Subscription Lists nominating candidates for local, parliamentary and presidential elections;
    - cancel the signatures affixed on Subscription Lists intended for referenda or nominating candidates for local, parliamentary and presidential elections;
    - view the events related to the interaction with "ESL" ITSS (signing and withdrawing the signature from the Subscription Lists);
    - receive notifications.
2. IG/PP Representatives – representatives of Initiative Groups or Political Parties who submit questions to be subject to voting during referenda or nominate candidates for local, parliamentary and presidential elections. These users shall have access to the following functionalities:
    - access all functionalities available to users with Voter's role;
    - retrieve statistical reports and documents related to the Subscription Lists collected on behalf of the represented Initiative Group/Political Party;
3. CEC Official – represents the CEC Elections Management Division Authorised Users who interact with "ESL" ITSS to exercise their job duties. These users shall have access to the following functionalities:
    - access all functionalities available to users with Voter's role;
    - access all functionalities available to users with IG/PP Representative role;
    - initiate Electronic Subscription Lists;
    - stop the subscription for relevant lists;
    - monitor the subscription process;
    - search and view the data.
4. System Administrator – human actor empowered to ensure "ESL" ITSS functionality under appropriate conditions. If the technological environment includes sufficient abilities to carry out administration works, then their implementation in the system is optional. This category of actors has got access to the following functionalities:
    - use unconditionally all functionalities of the IT System, except for amending the logging files;

- manage the "ESL" ITSS nomenclatures, classifiers and metadata;
- manage the "ESL" ITSS users' roles and rights through SAISE Admin mechanisms;
- configure the "ESL" ITSS resources, roles, transitions and workflows through SAISE Admin mechanisms;
- start/suspend the "ESL" ITSS operation;
- monitor the "ESL" ITSS functioning process;
- ensure information security;
- administer DB;
- manage interconnection interfaces with external and internal IT Systems.

"ESL" ITSS implementation involves interaction of the following IT Systems:

1. "ESL" ITSS – SAISE ITSS, which represents the objective of these Specifications and will digitise the processes of initiating the Subscription Lists and collecting Voters' signatures (electronic signing of Subscription Lists).
2. CEC official WEB page where the data and access references to active Subscription Lists shall be published.
3. SAISE – State Automated Information System "Elections" (SAISE) developed pursuant to Law No. 101 of 15.05.2008, which computerises the CEC electoral processes. As the "ESL" ITSS utilises a large part of common metadata of other SAISE ITSSs or resorts to their services, its integration with the following SAISE ITSSs is envisaged:
    - SAISE Admin – SAISE ITSS that provides authentication, authorisation, logging and notification services. Likewise, the "ESL" ITSS resources, statuses and transitions will be configured through SAISE Admin, as well as workflow rules, the managed or absorbed metadata, etc.;
    - "Subscription Lists" ITSS – SAISE ITSS of FB "Documentation" from where the data shall be taken up to initiate Subscription Lists and to where the data about the citizens who signed electronically the Subscription Lists shall be dispatched;
    - State Register of Voters – an ITSS to keep records on Moldovan voters, intended to collect, store, update and analyse the information about the Moldovan citizens who reached their majority and are not limited in their civil rights. The "ESL" ITSS shall take up all data related to voters – citizens of the Republic of Moldova from this ITSS to automatically fill the Subscription List.
4. External IT Systems represent all external IT Systems the "ESL" ITSS interacts with, namely:
    - MPass – platform service used to control access to IT Systems and ensure authentication procedures via Electronic or Mobile Signatures;
    - MSign – platform service used to affix and validate the Electronic Signature, including the Mobile Signature;
    - MLog – platform service used to log all critical business event related to IT Systems owned by Moldovan Public Authorities;
    - MNotify – platform service used to notify the "ESL" ITSS Authorised Users.

4. IT System Functional Model

4.1. IT System Information Objects

Having reviewed the modelled area (computerisation of management processes carried out by electoral officials), a data model can be defined to be taken into account in the process of "ESL" ITSS development. Figure 4.1. displays all information objects (and the relationship amongst them) to be used as foundation for designing and developing the "ESL" ITSS.

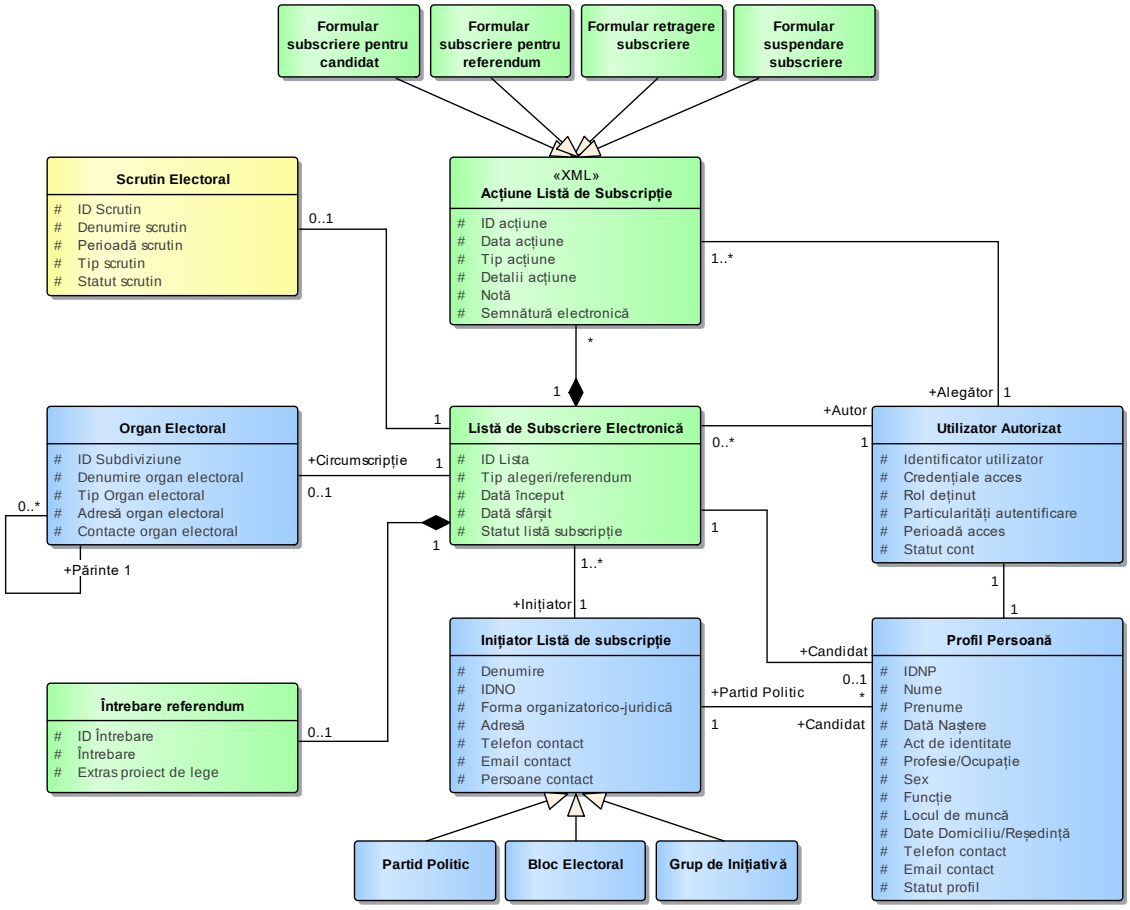

Figure 4.1. "ESL" ITSS Data Model.

To ensure the "ESL" ITSS operation under appropriate conditions it is necessary to implement the functionalities used to manage the following groups of information objects:

- Profiles;
- Subscription Lists;
- Elections.

1. Profiles

A complex information object that defines all profiles of natural and legal persons recorded in the *"ESL" ITSS*. This information object supposes there are three profile categories as follows:

A. *Natural Person Profile*. It represents the registration data for any natural person involved in the "ESL" ITSS processes, regardless of his/her role (CEC Officials, Voters, IG/PP Representatives and System Administrators). As a rule, the completeness level of the Natural person profile depends on his/her role and covers the following categories of data:

a) IDNP;
b) Last Name;

c) First Name;
d) Birth Date;
e) ID Document;
f) Profession/Occupation;
g) Gender;
h) Job Position;
i) Work Place;
j) Domicile/Residence Data;
k) Telephone Number(s);
l) Email;
m) Profile Status;
n) Other relevant data.

B. *Authorised User Profile*. It represents the profiles of IT System Authorised Users to be involved in "ESL" ITSS business processes or to have access to "ESL" ITSS data. The following data shall be managed for the Authorised User's profile:

a) User Identifier;
b) Access Credentials;
c) Reference to the Natural Person Profile (personal and contact data);
d) Roles held;
e) Authentication Approach/Restrictions (user+password, electronic/mobile signature, IP address, etc.);
f) Access Validity Period;
g) Profile Status.

C. *Electoral Body*. This information object shall record the infrastructure components of elections (polling stations, electoral constituencies, etc.) from where it is necessary to retrieve those electoral constituencies for which candidates are nominated. This information object is characterised by the following data:

a) Electoral Body Identifier;
b) Electoral Body Name;
c) Hierarchically Superior Electoral Body;
d) Electoral Body Type;
e) Electoral Body Address;
f) Electoral Body Contact Data;
g) Electoral Body Status.

D. *Subscription List Initiator's Profile.* It represents the profiles of subjects who designate persons as candidates for local, parliamentary and presidential elections. The following data shall be managed for the Subscription List Initiator's Profile:

a) IDNO;
b) Name of the Subject;
c) Organisational and Legal Form;
d) Mailing Address;
e) Telephone Number(s);
f) Email;
g) Contact Person(s) (and their Contact Info).

Subjects who can initiate Subscription Lists may be of two types: Political Parties (including Blocs and Movements) or Initiative Groups officially registered with the *CEC*.

2. Subscription Lists

The Subscription List is an "ESL" ITSS key information object through which it is envisaged to collect online signatures in favour of a candidate/nominee or a question proposed for referendum. The following categories of data shall be managed under the Subscription List:

- Subscription List Identifier:
- Type of Elections or Referendum;
- Signature Collection Starting Date;
- Signature Collection Ending Date;
- Question proposed for Referendum (if a Referendum is initiated);
- Proposed Candidate (if a Candidate is nominated);
- Electoral Constituency;
- Elections;
- Voters' Signatures;
- Withdrawal of Voters' Signatures;
- Voters' List Status.

The Subscription List shall be filled with data from the following subordinated entities:

A. *Question for referendum*. This information object shall record the Question to be subject to Referendum or the draft law to be subject to Referendum, having managed the following categories of data:

    a) Question Identifier;
    b) Question Content;
    c) Draft Law Summary/Extract.

B. *Subscription List Action*. This information object shall record all actions carried out by users for an Electronic Subscription List (signing the Subscription List for a candidate, signing the Subscription List for a referendum, withdrawing the signature affixed previously on the Subscription List, suspending the signature collection procedure). The user's action shall be recorded in a XML file signed electronically to comprise the following categories of data:

    a) Action Identifier;
    b) Form Type (Affixing/Withdrawing a Signature);
    c) Voter;
    d) Subscription List;
    e) Action details;
    f) Action related Note;
    g) Electronic Signature affixed on the Form.

3. Elections

An information object that defines the elections for which the candidate mentioned in the Subscription List is nominated and contains the following categories of data:

- Elections Identifier;
- Name of Elections;
- Period of Elections;
- Type of Elections;
- Status of Elections.

4.2. IT System Functionalities

Use Case Diagram presented in Figure 4.2 displays the functionalities provided by "ESL" ITSS to actors having access thereto.

As per the scheme described in Figure 4.2., the IT System actors shall have access to 16 Use Cases providing the following functionalities:

UC01: Use Dashboard

It represents the functionality through which the "ESL" ITSS Authorised User will be notified to view and access rapidly all business events related to his/her interaction with the IT Subsystem and job duties (System Notifications, Workflow Events, etc.).

Likewise, the Authorised User shall have direct access, through Dashboard, to functionalities relevant for the notified business events (direct access to the electronic form to be considered, direct approval of electronic forms received for consideration and approval, etc.).

The "ESL" ITSS User Interface Home Page will serve as Dashboard where all user-related elements and notifications will be posted. Likewise, this Use Case shall provide functionalities to configure the notifications for Subscription Lists that the Voter might be interested to sign.

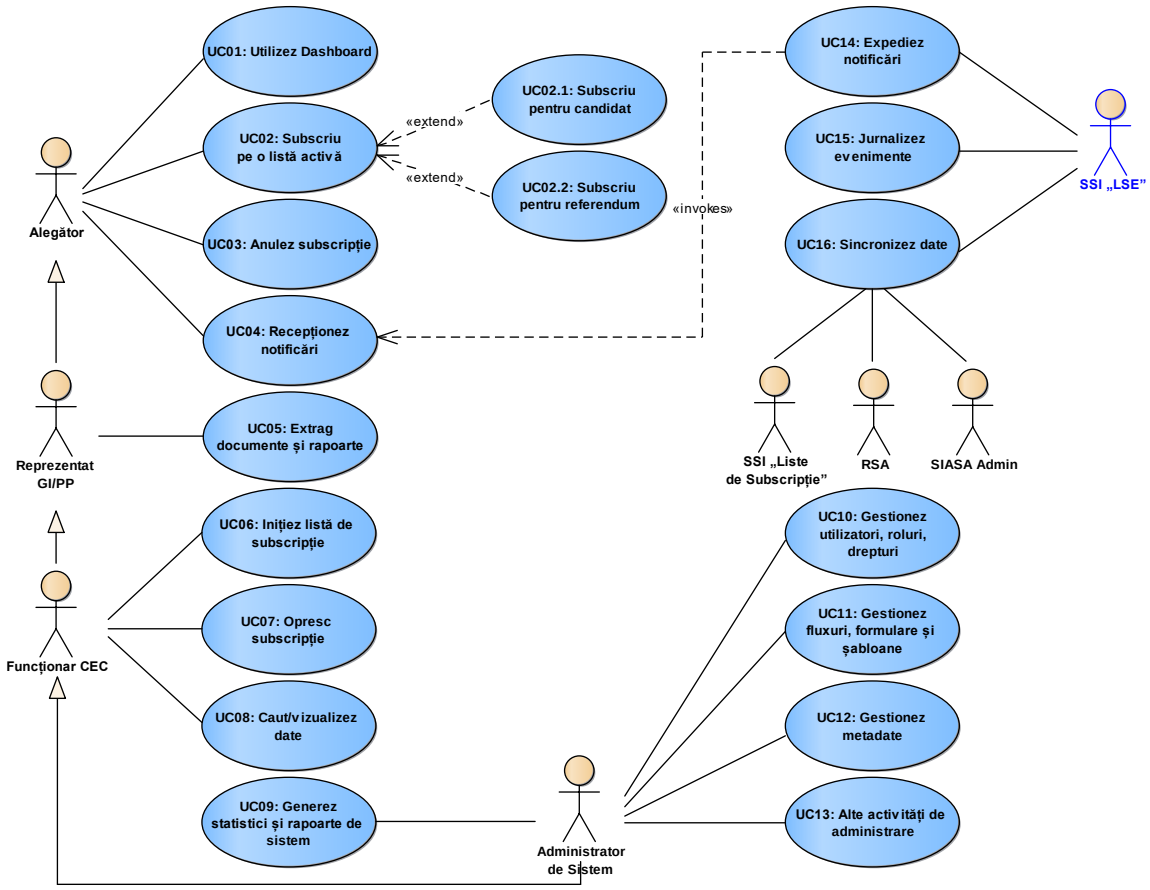

Figure 4.2. "ESL" ITSS Functionalities

UC02: Subscribe on an Active List

This is a complex Use Case to provide all electronic forms required to record Voters' actions concerning active Subscription Lists (for which signatures are collected). Taking into account the specificity of these actions, in the context of "ESL" ITSS, this Use Case will be implemented via the following Use Cases:

- **UC02.1**: Subscribe for a candidate. The Voter may use this functionality to sing the subscription form of an Electronic Subscription List intended to nominate a candidate for local, parliamentary or presidential elections;
- **UC02.2**: Subscribe for referendum. The Voter may use this functionality to sing the subscription form of an Electronic Subscription List intended to initiate an advisory, constitutional referendum, etc.

UC03: Cancel Subscription

A Use Case that shall provide the electronic form necessary to record Voters' actions on withdrawing the signature from the Subscription List. This involves cancelling the signature affixed previously and deleting the Voter from the Electronic Subscription List.

UC04: Receive Notifications

A Use Case through which the "ESL" ITSS Authorised Users will receive notifications sent by the IT Subsystem through Email or to an "ESL" ITSS Compartment intended to view and access the notifications of Authorised Users.

"ESL" ITSS will ensure automatic generation and dispatch via Email of notifications related to actors involved in the "ESL" ITSS activity. The Authorised User will have functionality for individual configuration of notification receipt preferences.

UC05: Retrieve Documents and Reports

This functionality shall be available to categories of Authorised Users assigned with the role of IG/PP Representative and CEC Official through which it would be possible to retrieve standard documents and statistical reports based on the "ESL" ITSS DB stock content.

Documents and reports are to be configured and retrieved on the basis of CEC reporting platform. The set of documents in paper will be provided to process and approve the Subscription Lists received by CEC, as well as reviewing and assisting the decision-making process related to Subscription Lists.

UC06: Initiate Subscription List

A Use Case that shall provide the CEC Officials with facilities to initiate Electronic Subscription Lists. This process involves synchronisation with the current IT solution – "Subscription Lists" ITSS in order to take up the data necessary to initiate the process of collecting the votes to transfer the process in online environment.

UC07: Cease Subscription

A Use Case that shall provide the CEC Officials with the functionalities to forcedly cease the process of signature collection through Electronic Subscription Lists when the candidate withdraws, the referendum initiative is withdrawn, as well as the decisions of competent bodies or dispatch the collected signatures to the "Subscription Lists" ITSS.

UC08: Search/View Data

A Use Case provided by "ESL" ITSS through which the Authorised Users would be able to explore the data stock they have access to due to their role assigned under the IT System and job duties. To this end, "ESL" ITSS will offer a searching mechanism, using different criteria, such as:

- **identification data of Subscription Lists;**
- **Voter's identification data;**
- **data related to "ESL" ITSS Authorised Users;**
- **data related to Voters' actions;**
- **identification data of Subscription List's initiators;**
- **data interval;**
- **data on Elections;**
- **data on administrative and territorial units (ATUs);**
- **electoral constituency;**
- **status of** Subscription Lists.

"ESL" ITSS will post as found results:

- **Subscription Lists;**

- **Voters' actions;**
- **Voters' profiles**;
- Profiles of S**ubscriptio**n Lists' initiators.

In addition, it would be advisable that the "ESL" ITSS delivers a mechanism for indexed search of data with full text searching options and present the results depending on their relevance.

UC09: Generated Statistics and System Reports

A Use Case that provides all functionalities accessible to System Administrator users enabling them to generate predefined and ad-hoc administrative reports on "ESL" ITSS operation events.

These reports are useful for reviewing the deployed processes, the ITSS information base, Authorised Users' activity performance, allowing to anticipate information security issues.

To a large extent, these functionalities will be provided by SAISE Admin. "ESL" ITSS shall be able to take up all relevant data supplied by the logging mechanism covered by SAISE Admin.

UC10: Manage Users, Roles, Rights

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

Likewise, this Use Case shall provide the functionalities necessary to define the access rights of users to user interface components and clarify the behaviour of the latter during the interaction with Authorised Users.

To a large extent, these functionalities will be provided by SAISE Admin. "ESL" ITSS shall be able to take up all rules and resource configurations and their transitions, users, roles, and business events accessible to them through SAISE Admin.

UC11: Manage Flows, Forms, and Templates

This is a Use Case intended for ITSS Administrators, which implements the functionalities available to them to configure workflows, electronic forms and standard document models used for each type of incoming and outgoing document (configure the areas of headers, footnotes, static and dynamic contents, formatting, graphical appearance, etc.).

A document template shall comprise beacons through which it would be possible to populate it with the info content retrieved from the DB.

To a large extent, these functionalities will be provided by SAISE Admin. "ESL" ITSS shall be able to implement all rules and configurations for workflows, electronic forms and document templates specified through SAISE Admin.

UC12: Manage Metadata

A Use Case that provides all functionalities intended for the System Administrator through which the latter shall manage all nomenclatures, classifiers and configurations, which together form the "ESL" ITSS metadata system.

UC13: Other Administration Activities

This is a Use Case intended for System Administrators, which describes all functionalities accessible to them to manage and audit the "ESL" ITSS. To a large extent, these functionalities will be provided by SAISE Admin and the System Administrator shall reuse them for "ESL" ITSS administration.

Use Case UC15 will implement all functionalities to ensure the ITSS viability and integrity.

UC14: Send Notifications

A Use Case through which the "ESL" ITSS Authorised Users shall be notified (in-house messaging or Email) on the occurrence of business events affecting them.

The users will receive notifications through certain facilities provided by "ESL" ITSS user interface and Email messaging. "ESL" ITSS will ensure functionality to directly access the business event details (electronic form of notified business event) from the notification.

The notification platform service of CEC interoperability framework and government notification service MNotify shall be used to implement the notification mechanism.

UC15: Log Events

A Use Case through which all business events generated by "ESL" ITSS functional components will be logged. Any event generated under the business processes implemented by "ESL" ITSS shall be logged and saved in the DB corresponding tables.

"ESL" ITSS shall periodically synchronise the data logged through the logging platform service of CEC interoperability framework provided by SAISE Admin. "ESL" ITSS will apply the logging approach of business events in its SAISE Admin resource configuration functions.

For critical business processes, "ESL" ITSS will implement logging procedures through government logging service MLog.

UC16: Synchronise Data

A Use Case through which "ESL" ITSS will launch, upon request or automatically with some regularity, certain synchronisation procedures with third party IT Systems to update "ESL" ITSS data or dispatch the signatures collected through "ESL" ITSS. Following on from that, it is expected to implement the following synchronisation categories:

- SRV (State Register of Voters) with the purpose to take up the data on identification and documenting the people who sign the Electronic Subscription Lists;
- SAISE Admin in order to reuse SAISE platform services, accessing the SAISE ITSSs common set of metadata;
- "Subscription Lists" ITSS with the purpose to take up the primary/baseline data necessary to initiate the Electronic Subscription Lists and dispatch the signatures collected through Electronic Subscription Lists.

All data synchronisation processes with third party IT Systems shall be logged, including through government logging service MLog.

4.3. IT System Workflows

The workflows to be implemented under the "ESL" ITSS are of low complexity and to a large extent involve actions to sign electronic forms intended to support a candidate, questions proposed for referendum or signature withdrawal.

It is expected to implement the following workflows:

- Initiate a Subscription List – workflow through which the actions aimed to initiate Subscription Lists are carried out, the list parameters are defined, relevant data are taken up from external sources (example: "Subscription Lists" ITSS), the process of signature collection is launched, and the potentially interested Voters are notified;
- Sign the Subscription List – workflow through which Voters may access the relevant Subscription List and affix their signature. This workflow involves automatic absorption of Voters' identification data from the SRV to automatically fill the form content to be signed electronically by Voters;

- Withdraw a signature from the Subscription List – workflow through which Voters can cancel their signature affixed previously on Subscription Lists;
- Cease subscription– workflow through which CEC Officials will close the electronic signature collection process when the candidate/ referendum initiative withdraws/is withdrawn or when the deadline for signature collection expired;
- Dispatch the collected signatures – workflow through which CEC Officials will dispatch the data collected through Electronic Subscription Lists towards the "Subscription Lists" ITSS.

4.4. IT System User Interface

"ESL" ITSS shall provide an ergonomic and intuitive user interface in Romanian and Russian to be accessible to all types of users through a WEB browser optimised for the 1360x768 resolution. The IT Subsystem shall have an amiable, intuitive and responsive graphical design compatible with all used devices (PC, notebook, tablet, smartphone).

Upon conceptualising the user interface due account shall be taken of CEC best practice implemented in the applications: SRV, FB "Voting", etc. To ensure user-friendliness, the IT solution shall have a contextual help system online for user interface intended for users assigned with Voter's role.

The "ESL" ITSS users shall have at least four basic access levels to user interface (sets of rights and roles assigned to them, as well as the optimal number of access groups to be configured by the IT System Administrator through the mechanisms provided by SAISE Admin):

- Access level for Voters – a level for citizens with voting rights who will have a specialised interface to affix their electronic signature on Electronic Subscription Lists, cancel subscription or view the history of interaction with "ESL" ITSS. This type of users will be authenticated via electronic or mobile signature (using MPass);
- Access level for representatives of Initiative Group/Political Party – a level for authorised persons of Initiative Groups or Political Parties who collect signatures in support of candidates in local/parliamentary/presidential elections or referenda, and will use the user interface facilities provided by "ESL" ITSS to monitor the process of collecting electronic signatures. This type of users will be authenticated via electronic or mobile signature (using MPass).
- Access level for CEC Official – a level for CEC authorised persons who will use the facilities provided by "ESL" ITSS user interface to exercise their job duties (initiate Electronic Subscription Lists, retrieve reports and documents specific for the signature collection process, monitor the process of collecting electronic signatures, cease the process of signature collection and dispatch the data towards the "Subscription Lists" ITSS). This type of users will be authenticated via User Name+Password or Active Directory;
- Access level for System Administrators – a level for users having the highest access level to the IT System resources. System Administrators shall authorise their access via User Name+Password or Active Directory. This level, due to the assigned role to ensure appropriate operation of the IT solution, will ensure access to all user interface functionalities and the DB content provided by user interface.

The procedures for information and records retrieval will be carried out through simple searches (specifying searching series) or through more complex searches, through which more precise filtering of information can be achieved (QBE forms). Regardless of the type of searched information the user will apply the same type of query and information retrieval for any software compartment.

In addition to the searching manner carried out based on QBE principle, which would enable defining sophisticated visual query, the interface shall provide the possibility to fine tune the search results by ensuring the possibility to filter the data in the list of search results.

The IT System user interface shall ensure filtering the records corresponding to the search criteria provided to users depending on their access rights.

Indexed values (values from Classifiers, Nomenclatures) shall have the option to be filtered by picking up 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 characteristic sought (example: 20.05.2020 - all records with the specified date) or by logical criteria (example: <31.05.2020 – all records with the date older than 31.05.2020, >01.01.2020 – all records with the date more recent than 01 January 2020).

Also, there should be the possibility to filter the result according to the mask (for example, filtering by IDNP) as per the model: 098121224* - all records that begin with the series of characters "098121224", *ARU - all records that end with the series of characters "ARU" or *PARTID* - all records that comprise the series of characters "PARTID" in their contents.

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

4.5. IT System Reporting, Audit and Statistical Mechanism

"ESL" ITSS should have implemented industry widely used functionalities intended for auditing/logging. This is configurable for logging technical and business events. The IT Subsystem shall provide a mechanism to generate predefined and ad-hoc reports capable to ensure a pertinent review or assessment of signature collection processes through Electronic Subscription Lists.

"ESL" ITSS shall deliver a mechanism intended for dynamic generation of diverse reports, granting the possibility to configure the parameters for report generation.

"ESL" ITSS reporting system shall define four reporting categories:

- Documents generated on the basis of a predefined template – a template should be created for each type to be populated with document relevant information (example: Subscription List for a candidate, Subscription List for referendum, receipt, etc.);
- Performance indicators – this is a set of KPIs on which basis it is envisaged to assess the process of signature collection for Electronic Subscription Lists, the IT System functioning performance, the Registrars work performance, etc.;
- Monitoring reports – this is a category of reports intended for users assigned with administrative roles used to assess how Authorised Users interact with "ESL" ITSS. This category of reports will organise and post the content of logged files, on which basis the IT System vulnerabilities could be anticipated and reviewed;
- Performance reports – this a category of static reports (implemented, as a rule, physically in the IT System content) oriented towards the "ESL" ITSS audit and information analysis. The Developer shall integrate at least ten categories of such reports, which lay-out would be delivered at the time of conducting business analysis.

The reporting mechanism peculiarities are described in a series of compartments of this Document, namely:

- Compartment 5.1.5 (Functional Requirements for Use Case UC05: Retrieve Documents and Reports);
- Compartment 5.1.9 (Functional Requirements for Use Case UC09: Generate Statistics and System Reports);
- Compartment 5.1.10 (Functional Requirements for Use Case UC10: Manage Flows, Forms, and Templates).

5. IT Subsystem Requirements

1.5. 5.1. IT Subsystem Functional Requirements

5.1.1. UC01: Use Dashboard

The functional requirements for Dashboard operation intended for "ESL" ITSS Authorised Users are displayed in Table 5.1.

Table 5.1. Functional Requirements for Use Case UC01.

Identifier	Binding level	Description of Functional Requirements
FR 01.01.	M	"ESL" ITSS shall deliver Dashboard to Authorised Users through which the latter will be notified about important business events and have rapid access to event details.
FR 01.02.	M	The following categories de business events posted on Dashboard can be listed: ■ System notifications; ■ Notifications on active Subscription Lists the Voters could be interested in; ■ notifications on the need to involve the user in the "ESL" ITSS workflows (example: ending the period of signature collection); ■ events related to signature affixing; ■ events related to signature withdrawal; ■ authentication events in the "ESL" ITSS; ■ other relevant events.
FR 01.03.	M	The "ESL" ITSS user Dashboard will post just business events relevant for users' roles and available data.
FR 01.04.	M	Dashboard will group all business events, having posted them as indicators with aggregated values (example: Unread System Notifications – 10; Subscription Forms – 10; Forms for Signature Withdrawal – 2; Active Subscription Lists, Completed Subscription Lists, etc.) to comprise hypertext reference to access the details.
FR 01.05.	M	"ESL" ITSS will post detailed Dashboard records in specialised windows or areas on the user interface Home Page to comprise hypertext reference to access the details.
FR 01.06	M	Upon accessing the hypertext reference related to aggregated value or detailed record of Dashboard, "ESL" ITSS will ensure access to detailed information or required functionality (example: content of the Subscription List form, content of the Subscription List signing form, etc.).
FR 01.07.	M	"ESL" ITSS shall deliver facilities to search /filter the records related to the list of events posted on Dashboard.
FR 01.08.	M	"ESL" ITSS shall deliver facilities to configure the categories of Subscription Lists to be notified to the Voter on the time of initiation (example: candidates nominated or referenda submitted by certain Political Parties).

Identifier	Binding level	Description of Functional Requirements
FR 01.09.	D	"ESL" ITSS will provide each user with functionality for individual configuration of Dashboard appearance and content.

5.1.2. UC02: Subscribe on an Active List

The functional requirements set for the electronic form preparing component intended to sign the Subscription Lists are displayed in Table 5.2.

Table 5.2. Functional Requirements for Use Case UC02.

Identifier	Binding level	Description of Functional Requirements
FR 02.01.	M	SSE "LSE" shall provide electronic forms intended for Voters to affix their electronic signature on Subscription Lists.
FR 02.02.	M	Electronic forms will be implemented to record the following events related to signing the Subscription Lists: ■ for local referendum; ■ for republican referendum; ■ for constitutional referendum; ■ for nominating a mayoral candidate; ■ for nominating a candidate for the position of local/district/municipal councillor; ■ for nominating a candidate to perform the duties of Member of Parliament; ■ for nominating a candidate for country President.
FR 02.03.	M	SSE "LSE" will display only Active Subscription Lists to the Voter, which the latter has the right to sign (the Voter's domicile address will be taken account for).
FR 02.04.	M	The Voter will have functionality to search relevant Subscription Lists (by IG/PP, type of Subscription List, ATU, etc.)
FR 02.05.	M	The electronic form intended for signing the Subscription List will be initiated from the Subscription List electronic form ("ESL" ITSS will post the Subscription List header and the option to launch the signing process).
FR 02.06.	M	The Voter will not be able to view the registration data of other Subscription List Signatories.
FR 02.07.	M	Once the option of signing the Subscription List has been launched, the "ESL" ITSS shall open the form prefilled with the following data: ■ Data describing the Subscription List objective (header of Subscription Lists included in Annexes 1-2, which contain the data explaining for what the Voter signs); ■ The required option (sign the Subscription List).
FR 02.08.	M	"ESL" ITSS shall provide the Voter with the possibility to fill a note related to the decision to sign the Subscription List (it is not binding to fill it).
FR 02.09.	M	SSE "LSE" shall check the admissibility for the Voter to sign the Subscription List (example: the Voter has not signed other Subscription

Identifier	Binding level	Description of Functional Requirements
		Lists).
FR 02.10.	M	Should there be a conflict in affixing the signature on a Subscription List, "ESL" ITSS would suggest options to view the signature representing the conflict object to be withdrawn through UC03.
FR 02.11.	M	For withdrawing the signature from the Subscription List the Voter shall affix his/her Electronic Signature on the electronic form to withdraw his/her signature from the Subscription List (prepared through FR 03.01-FR 03.05).
FR 02.12.	M	Should there be no conflict, the "ESL" ITSS shall provide functionality to sign the electronic form intended to record the event of signing the Subscription List.
FR 02.13.	M	MSign shall be used as a mechanism to sign the electronic form intended to record the event of signing the Subscription List.
FR 02.14.	M	Once the Electronic Signature has been affixed, the "ESL" ITSS shall calculate the HASH value of the signed electronic form and save it to be used by UC05.
FR 02.15.	M	Any electronic form intended to record the event of signing the Subscription List shall have an associated document template to be configured through UC11 and populated with the data contained in the form.
FR 02.16.	M	After having signed the electronic form intended to record the event of signing the Subscription List, the "ESL" ITSS will send a notification to the Voter comprising a receipt on fulfilling his/her request.
FR 02.17.	M	"ESL" ITSS shall mandatorily log all events related to the signature of Subscription Lists through MLog.

5.1.3. UC03: Cancel Subscription

The functional requirements for the component intended to withdraw the Voters' signature from the Subscription List are displayed in Table 5.3.

Table 5.3. Functional Requirements for Use Case UC03.

Identifier	Binding level	Description of Functional Requirements
FR 03.01.	M	"ESL" ITSS will deliver functionality to withdraw the Voter's signature from the Subscription List.
FR 03.02.	M	The Voter's signature can be withdrawn from the Subscription List only on the basis of a specialised electronic form signed electronically by the Voter.
FR 03.03.	M	The electronic form intended for withdrawing the signature from the Subscription List will be activated from the Subscription List electronic form ("ESL" ITSS will post the Subscription List header and the record on signing the Subscription List by the Voter.
FR 03.04.	M	Once the option to withdraw the signature has been activated, the "ESL" ITSS shall open the form prefilled with the following data:

Identifier	Binding level	Description of Functional Requirements
		■ Data describing the Subscription List objective (the Subscription List header included in Annexes 1-2); ■ Details of the signing event to be cancelled; ■ The requested option (cancel the signature affixed on the Subscription List).
FR 03.05.	M	"ESL" ITSS shall provide the Voter with the possibility to fill a note about the reason for withdrawing the signature from the Subscription List (this is not binding).
FR 03.06.	M	To withdraw his/her signature from the Subscription List the Voter shall affix his/her Electronic Signature on the electronic form for withdrawing the signature from the Subscription List (prepared through FR 03.01-FR 03.05).
FR 03.07.	M	MSign shall be used to sign the electronic form intended to withdraw the signature from the Subscription List.
FR 03.08.	M	After signing the form to withdraw the signature from the Subscription List the "ESL" ITSS will send a notification to the Voter containing the receipt on fulfilling his/her request.
FR 03.09.	M	"ESL" ITSS shall log mandatorily all events related to the withdrawal of signatures from Electronic Subscription Lists through MLog.

5.1.4. UC04: Receive Notifications

The functional requirements for the mechanism intended to receive notifications sent by "ESL" ITSS to Authorised Users are displayed in Table 5.4.

Table 5.4. Functional Requirements for Use Case UC04.

Identifier	Binding level	Description of Functional Requirements
FR 04.01.	M	"ESL" ITSS will automatically notify any Authorised User when a business event involves his/her action or changes the status of processes managed, monitored by him/her, or which may affect him/her.
FR 04.02.	M	The Authorised Users will receive notifications on their Email indicated in their profile from "ESL" ITSS and the Electronic Signature.
FR 04.03.	M	A copy of the notification will be posted in a dedicated space of user interface.
FR 04.04.	M	The Authorised User will have functionality to configure the preferences for receiving notifications on their Email.
FR 04.05.	M	"ESL" ITSS will send the whole range of notifications intended for Voters regarding the relevant electronic subscription lists: ■ notification on receiving the Voter's signature for the Subscription List; ■ notification on withdrawing the Voter's signature from the Subscription List; ■ notification on Subscription Lists the Voter may be

Identifier	Binding level	Description of Functional Requirements
		interested to sign (based on configurations stated in UC01); ■ notification on the expiry of the deadline for signing the Subscription Lists for which the Voter might be interested; ■ other relevant notifications.
FR 04.06.	M	"ESL" ITSS will send the whole range of notifications intended for CEC Authorised Users: ■ notification on launching the process of signature collection through the Electronic Subscription List; ■ notification on the expiry of the deadline for signature collection for Electronic Subscription Lists; ■ notification on suspending the process of signature collection for Subscription Lists (carried out through UC07); ■ notification on the need to dispatch the collected signatures to "Subscription Lists" ITSS; ■ other relevant notifications.
FR 04.07.	M	"ESL" ITSS will send the whole range of notifications intended for Authorised Users of Initiative Groups /Political Parties: ■ notification on launching the process of signature collection through the IG/PP Electronic Subscription List; ■ notification on the expiry of the deadline for signature collection for the IG/PP Electronic Subscription Lists; ■ notification on suspending the process of signature collection for IG/PP Subscription Lists (carried out through UC07); ■ other relevant notifications.
FR 04.08.	M	Where appropriate, a notification shall contain hypertext reference to access the object concerned (example: electronic form).
FR 04.09.	M	Where appropriate, a notification may enclose files generated on the basis of business event details that generated it (example: receipt, receiving/withdrawing the signature.

5.1.5. UC05: Retrieve Documents and Reports

The functional requirements of the mechanism for the retrieval of documents and reports to be provided by "ESL" ITSS are displayed in Table 5.5.

Table 5.5. Functional Requirements for Use Case UC05.

Identifier	Binding level	Description of Functional Requirements
FR 05.01.	M	"ESL" ITSS will use the CEC reporting platform to generate all statistical documents and reports.
FR 05.02.	M	"ESL" ITSS shall provide functionality to generate the following documents: ■ Subscription List to initiate a referendum (as per the sample presented in Annex 1); ■ Subscription List to nominate a candidate as per the

Identifier	Binding level	Description of Functional Requirements
		sample presented in Annex 2);
FR 05.03.	M	Upon the generation of documents specified in FR 05.02 all signatures cancelled through UC03 will be ignored.
FR 05.04.	M	In the Compartment with Voter's signature on the Subscription List "ESL" ITSS will insert the HASH value of the subscription electronic form signed electronically by the Voter through UC02.
FR 05.05.	M	A generated document should be saved in a PDF file.
FR 05.06.	M	"ESL" ITSS shall be able provide a number of management, statistical and ad-hoc reports so that the administrative roles are able to monitor the System work and status.
FR 05.07.	M	"ESL" ITSS will provide a set of reports intended for processing or retrieving data on CEC interaction with electoral candidates throughout the election campaign: ■ the Subscription List resulting report with aggregation by ATU principle and by gender; ■ the Authorised User performance report presenting the summary of his/her interaction with "ESL" ITSS (for Voter and CEC Official roles) for the calendar period, types of Subscription Lists and specific events; ■ IG/PP performance report presenting the summary of data related to the initiated Subscription Lists (for the calendar period, types of lists, administrative and territorial division, etc.).
FR 05.08.	M	User who generates a report within the "ESL" ITSS shall be able to export it in an editable external file (DOC/DOCX, CSV or XLS/XLSX).
FR 05.09.	M	By default, the reports will be saved in PDF format.
FR 05.10.	M	Overall, the Developer will implement up to 15 categories of predefined documents and reports requested by the Beneficiary (including the ones mentioned in FR 05.02 and FR 05.07).
FR 05.11.	M	"ESL" ITSS shall log all events related to documents and reports retrieval (including through MLog).

5.1.6. UC06: Initiate Subscription List

The functional requirements for the component intended to initiate Subscription Lists are displayed in Table 5.6.

Table 5.6. Functional Requirements for Use Case UC06.

Identifier	Binding level	Description of Functional Requirements
FR 06.01.	M	"ESL" ITSS shall deliver an electronic form intended to initiate a Subscription List.
FR 06.02.	M	The Electronic Subscription List will absorb automatically the data from the "Subscription Lists" ITSS through UC16 necessary to configure the

Identifier	Binding level	Description of Functional Requirements
		Electronic Subscription Lists (data from the Subscription List header included in Annexes 1-2).
FR 06.03.	M	To initiate a Subscription List (activate the process of signature collection) the corresponding electronic form shall be signed by the CEC Official.
FR 06.04.	M	MSign will be used as a mechanism to sign electronically the electronic form intended to initiate the Subscription List.
FR 06.05.	M	Prior to affixing the electronic signature and initiating the Subscription List "ESL" ITSS will validate the electronic form content intended for the initiation of Subscription Lists. A Subscription List shall be activated only after its content has been validated and signed.
FR 06.06	M	Upon initiating a Subscription List the "ESL" ITSS will publish relevant data and the access reference to the Subscription List initiated on the CEC official WEB page (through UC19).
FR 06.07	M	Upon initiating a Subscription List the "ESL" ITSS will notify all relevant users (potentially interested Voters and the IG/PP initiator of the Subscription List).
FR 06.08	M	"ESL" ITSS shall log mandatorily all events related to the initiation of Electronic Subscription Lists through MLog.

5.1.7. UC07: Cease Subscription

The functional requirements for the component intended to complete or suspend the process of subscription of Voter's signatures are displayed in Table 5.7.

Table 5.7. Functional Requirements for Use Case UC07.

Identifier	Binding level	Description of Functional Requirements
FR 07.01.	M	"ESL" ITSS will cease automatically the process of signature collection for Subscription Lists when the period of signature collection expires (the option for signing/withdrawing the signature will be not accessible anymore, while the reference will be removed from CEC official WEB page).
FR 07.02.	M	"ESL" ITSS shall provide functionality to dispatch the Subscription List signatory data for which the period of signature expired to "Subscription Lists" ITSS through UC16 (the HASH value of the electronic form signed by Voters will be inserted instead of signature).
FR 07.03.	M	"ESL" ITSS shall provide functionality to export the Subscription List signatory data for which the period of signature expired in standard CSV/XLSX format (the HASH value of the electronic form signed by Voters will be inserted instead of signature).
FR 07.04.	M	"ESL" ITSS shall provide functionality to suspend the process of signature collection on the Subscription List when the candidate withdraws, the referendum initiative is withdrawn, the decision of the body empowered to suspend the process of signature collection, etc.

Identifier	Binding level	Description of Functional Requirements
FR 07.05.	M	The process of signature collection on the Subscription List can be suspended only when a specialised electronic form is prepared, which contains: ■ Data describing the Subscription List objective (the Subscription List header included in Annexes 1-2); ■ Reason for suspending; ■ Document that underlines the suspension; ■ Electronic Signature of CEC Official.
FR 07.06.	M	MSign will be used as a mechanism for electronic signing of the electronic form intended for suspending the process of signature collection on the Subscription List.
FR 07.07.	M	When the electronic form for suspending the process of signature collection on Subscription Lists has been approved, List "ESL" ITSS will notify all Subscription List relevant users (the Voters who signed and the IG/PP initiator of the Subscription List).
FR 07.08.	M	"ESL" ITSS shall log mandatorily all completing or suspending events related to the process of signature collection on Electronic Subscription Lists through MLog.

5.1.8. UC08: Search/View Data

The functional requirements necessary to define the data search queries in the "ESL" ITSS data stock and manage the obtained results are displayed in Table 5.8.

Table 5.8. Functional Requirements for Use Case UC08.

Identifier	Binding level	Description of Functional Requirements
FR 08.01.	M	"ESL" ITSS shall provide a mechanism for searching and viewing the data and documents in the data stock content.
FR 08.02.	D	"ESL" ITSS shall provide a mechanism for indexed search of data. The mechanism will make use of morphological means.
FR 08.03.	M	"ESL" ITSS will enable defining the following search targets (the search result will post the list of): ■ Subscription Lists; ■ Voters' actions; ■ Voters' profiles; ■ Profiles of Subscription List initiators.
FR 08.04.	M	"ESL" ITSS shall provide a flexible and advanced mechanism to define the search criteria.
FR 08.05.	M	"ESL" ITSS will enable using at least the following search parameters: ■ Subscription List identification data; ■ Voter's identification data; ■ data related to "ESL" ITSS Authorised Users; ■ data related to Voters' actions; ■ identification data of Subscription List initiators;

Identifier	Binding level	Description of Functional Requirements
		■ data interval; ■ Elections data; ■ ATU data; ■ Electoral constituency; ■ Status of Subscription Lists. ■ other relevant criteria.
FR 08.06.	M	When the search criteria wording is too wide or when they require too much time and resources "ESL" ITSS will not perform the queries, asking instead to narrow the area of searched values.
FR 08.07.	M	The search results will be ordered depending on the query result relevance, in alphabetical order or by the date of creation/last update.
FR 08.08.	M	The user will be able to define criteria for ordering and grouping the content of the list comprising the search results.
FR 08.09.	M	To avoid overloading the WEB browser and data transmission channels "ESL" ITSS will provide a mechanism for paging the query results.
FR 08.10.	D	Search result records will be marked (in specific colours or icons) depending on the nature or status of the found information object.
FR 08.11.	M	"ESL" ITSS shall provide functionality to fine tune the search in the found results.
FR 08.12.	M	In the search results "ESL" ITSS will post only the data that match the user area of competence (his/her roles and rights).
FR 08.13.	M	"ESL" ITSS will restrict access to details of found results when the user who launched the search process does not have access to the requested information objects to be accessed.
FR 08.14.	M	"ESL" ITSS will enable exporting the table with search results in CSV, RTF or PDF format.

5.1.9. UC09: Generated Statistics and System Reports

The functional requirements for the reports retrieval component for the purpose of "ESL" ITSS auditing are displayed in Table 5.9.

Table 5.9. Functional Requirements for Use Case UC09.

Identifier	Binding level	Description of Functional Requirements
FR 09.01.	M	"ESL" ITSS shall be able to provide a number of management, statistical and ad-hoc reports, so that the administrative roles can monitor the System work and status.
FR 09.02.	M	The reports managed through UC08 are intended for the IT audit functions and do not include reports on the "ESL" ITSS data stock content generated through UC05.
FR 09.03.	M	This reporting is necessary for the whole System, including: ■ nomenclatures and classifiers; ■ DB records;

Identifier	Binding level	Description of Functional Requirements
		■ user activity; ■ access and security permits.
FR 09.04.	M	The reports will be generated on the basis of the following categories of logged events: ■ successful authentication of users; ■ failed authentication of users; ■ notifications sent; ■ actions on data (access, add, change, delete).
FR 09.05.	M	"ESL" ITSS will enable retrieving aggregated reports or their detailing per ATU, Initiative Group, Political party, etc.
FR 09.06.	M	The user who views a report within the "ESL" ITSS shall be able to export it in an external editable file.
FR 09.07.	M	The Developer will implement up to ten predefined IT audit reports requested by CEC. For audit reports that can be generated through the System means there is no need to implement "ESL" ITSS user interface.
FR 09.08.	M	To retrieve UC08 System relevant reports and statistics the mechanisms provided by SAISE Admin will be reused.

5.1.10. UC10: Manage Users, Roles, Rights.

The functional requirements for the user administration component and configuration of access to "ESL" ITSS user interface and DB content are mirrored in Table 5.10.

Table 5.10. Functional Requirements for Use Case UC10.

Identifier	Binding level	Description of Functional Requirements
FR 10.01.	M	To define and manage users, their roles and rights "ESL" ITSS will reuse the SAISE Admin mechanism.
FR 10.02.	M	Authentication of users will be done through the facilities provided by SAISE Admin and MPass, using one of the following approaches: user name+password, IP address, electronic signature, mobile signature or LDAP.
FR 10.03.	M	"ESL" ITSS will take account of user authentication preference or rule (electronic signature, mobile signature, user name+password, IP address or a combination thereof).
FR 10.04.	M	User authorisation will be done through the facilities provided by SAISE Admin.
FR 10.05.	M	"ESL" ITSS will comprise a default user component created by the Developer and its credentials will be handed to the category of **super-administrator** upon delivery.
FR 10.06.	M	"ESL" ITSS will enable locking/unlocking users' access.
FR 10.07.	M	Under the user profiles the following categories of data will be managed: ■ User Last Name;

Identifier	Binding level	Description of Functional Requirements
		■ User First Name; ■ Email; ■ Telephone number(s); ■ Access login; ■ Access password ; ■ Authentication approach (user name+password, electronic signature/mobile signature, LDAP, etc.); ■ Enabled/disabled account; ■ Access validity period; ■ User's roles; ■ Other relevant data.
FR 10.08.	M	"ESL" ITSS will take account of user configurations in SAISE Admin on access rights to data depending on the categories or types of electronic forms prepared or data prepared and accessed.
FR 10.09.	M	A user account can be physically deleted only when there are no logged events produced by the deleted user or data entered by him/her.
FR 10.10.	M	"ESL" ITSS will take account of user configurations in SAISE Admin to ensure access to user interface and IT System content for each individual user or group of users.
FR 10.11.	M	The IT Subsystem will enable configuring an unlimited number of roles through the facilities provided by SAISE Admin.
FR 10.12.	M	A role is defined by a generic name, brief description and enabled/disabled status. Upon configuring the access rights to application resources or users' rights the disabled roles will not be posted.
FR 10.13.	M	Once introduced, activated and configured in SAISE Admin, "ESL" ITSS will take account of all its configurations while interacting with the Authorised Users.
FR 10.14.	M	A role cannot be deleted if it is attached at least to one user or one component of "ESL" ITSS user interface.
FR 10.15.	M	"ESL" ITSS will reuse the mechanism for recording the user interface components (resources) provided by SAISE Admin aiming to define the user's access rights to user interface. By a component it shall be understood any application modular entity (form, menu, menu option, field, etc.) which detailing level is sufficient to configure the access rights, workflow transitions and actions accessible to users.
FR 10.16.	M	Any component of "ESL" ITSS user interface will contain data on the generic name, brief description, actions available to users (business events they can generate), roles having access to user interface or action.
FR 10.17.	M	Any component of "ESL" ITSS user interface recorded in SAISE Admin will comprise data on statuses through which data managed by this component may go, the component status transitions (workflow status

Identifier	Binding level	Description of Functional Requirements
		configuration).
FR 10.18.	M	"ESL" ITSS will be able to define through SAISE Admin the permits related to actions (business events) available to users with access to user interface components. The following categories of actions available to users will be configured: ■ view records/entries; ■ add records/entries; ■ change records/entries; ■ delete records/entries; ■ other relevant actions.
FR 10.19.	M	"ESL" ITSS will enable configuring the logging approach for business events generated by each user interface component (using SAISE Admin logging mechanism, MLog or both).

5.1.11. UC11: Manage Flows, Forms, and Templates

The functional requirements for the configuration component of workflows, electronic forms intended for inserting data and configuring document templates to be populated with data and generated by "ESL" ITSS are displayed in Table 5.11.

Table 5.11. Functional Requirements for Use Case UC11.

Identifier	Binding level	Description of Functional Requirements
FR 11.01.	M	"ESL" ITSS will use the resource management mechanism provided by SAISE Admin to configure workflows and define the rules for their deployment for all scenarios related to electronic form preparation and processing, which match the business specific events of Electronic Subscription Lists.
FR 11.02.	M	The workflows will be defined by specifying the status through which an electronic form may go and the processing steps (stages or transitions covered by the electronic form) undertaken by the users assigned with specific roles.
FR 11.03.	M	A workflow will be implemented as a set of activities through which an electronic form prepared under sequentially unrolled business processes may go.
FR 11.04.	D	The number of steps to be included in a workflow shall not be limited. In this way the IT solution will be adaptable to any change in the work methodology with documents processed under the signature collection processes through Electronic Subscription Lists (example: statuses through which an electronic subscription list may go).
FR 11.05.	M	A workflow should be able to have associated a Coordinator (Supervisor). The Coordinator shall be able to get alerting messages (notifications) generated by the rolled workflow. The user who launches a form to be processed within a workflow shall be able to state who the workflow Supervisor is.
FR 11.06.	D	"ESL" ITSS will provide a mechanism to configure the electronic forms

Identifier	Binding level	Description of Functional Requirements
		necessary to prepare the documents for managing the Electronic Subscription Lists (their statuses and transitions) and the versioning thereof.
FR 11.07.	M	"ESL" ITSS will use the CEC reporting platform to configure document templates afferent to the documents generated on the basis of prepared electronic forms (the templates will have a well-defined structure to enable changing the appearance and content of the retrieved document).
FR 11.08.	M	The Developer will configure and implement electronic forms and templates to generate all documents specific for "ESL" ITSS business processes: ■ Form to configure the Electronic Subscription List; ■ Form to sign the Electronic Subscription List; ■ Form to withdraw the signature from the Electronic Subscription List; ■ Form to suspend the process of signature collection; ■ Other relevant forms.

5.1.12. UC12. Manage Metadata

The functional requirements necessary to manage the "ESL" ITSS metadata are included in Table 5.12.

Table 5.12. Functional Requirements for Use Case UC12.

Identifier	Binding level	Description of Functional Requirements
FR 12.01.	M	"ESL" ITSS will have a mechanism to manage nomenclatures, classifiers containing all metadata intended for configuring the System and managing the "ESL" ITSS business processes.
FR 12.02.	M	Where appropriate, classifiers managed by the National Bureau of Statistics (CUATM, CFOJ, CFP, etc.) and other official classifiers managed by CPAs and LPAs of the Republic of Moldova will be absorbed in full.
FR 12.03.	M	The rights to operate changes in official classifiers shall be limited. Changes shall be operated for this category of classifiers only when they are operated by the CPA that administers them.
FR 12.04.	M	The IT solution will deliver a mechanism to define and ensure dynamic administration of in-house nomenclatures and metadata.
FR 12.05.	M	"ESL" ITSS will not be enabled to delete a category of metadata if it is used at least by one DB record/entry.
FR 12.06.	M	"ESL" ITSS will be capable to reuse the system of metadata administered through SAISE Admin, covering: ■ "ESL" ITSS system configurations; ■ parameters and constants necessary for the "ESL" ITSS operation; ■ configurations of external services accessed by the "ESL" ITSS;

Identifier	Binding level	Description of Functional Requirements
		■ official nomenclatures and classifiers of the Republic of Moldova (CUATM, CFP, CFOJ, etc.); ■ SRV nomenclatures and classifiers; ■ nomenclatures and classifiers of the "Subscription Lists" ITSS; ■ other categories of global metadata reused by SAISE applications.
FR 12.17	M	The values of "ESL" ITSS nomenclatures and classifiers should be entered in Romanian and Russian.
FR 12.18	M	"ESL" ITSS shall provide functionality for versioning the metadata values, which provide the possibility to specify the value validity timeframe (to be taken into account when inserting the data, viewing the data and generating reports).

5.1.13. UC13: Other Administration Activities

The functional requirements for "ESL" ITSS administration activities are displayed in Table 5.13.

Table 5.13. Functional Requirements for Use Case UC13.

Identifier	Binding level	Description of Functional Requirements
FR 13.01.	M	"ESL" ITSS shall enable the administrative roles to take over, post and reconfigure the system operation parameters and settings.
FR 13.02.	M	"ESL" ITSS will enable the users assigned with System Administrator roles to configure the access to WEB services provided by external IT System the "ESL" ITSS interacts with.
FR 13.03.	M	The System Administrator will mainly administer the "ESL" ITSS through the mechanisms provided by SAISE Admin.
FR 13.04.	M	The System Administrator will be able to access and review the "ESL" ITSS logs, including through the mechanisms provided by SAISE Admin.
FR 13.05.	M	The System Administrator will be able to monitor the "ESL" ITSS functionality, including through the mechanisms provided by SAISE Admin.
FR 13.06.	M	The System Administrator will be able to generate "ESL" ITSS back-ups and restore the ITSS functionality on the basis of those back-ups.
FR 13.07.	M	"ESL" ITSS shall provide the System Administrator with all functionalities necessary to ensure the IT solution operation under appropriate conditions.

5.1.14. UC14: Send Notifications

The functional requirements for the "ESL" ITSS users' notification component are displayed in Table 5.14.

Table 5.14. Functional Requirements for Use Case UC14.

Identifier	Binding level	Description of Functional Requirements
FR 14.01	M	Notification of "ESL" ITSS users shall be done through the platform service of CEC interoperability framework provided by SAISE Admin and government notification service MNotify.
FR 14.02	M	Depending on user's profile configuration data, the notification service will apply one out of three notification approaches: ■ notification via Email; ■ notification on "ESL" ITSS user interface; ■ both approaches.
FR 14.03	M	Depending on "ESL" ITSS resource configurations in SAISE Admin, the notification service shall notify the relevant users when a business event specific for the IT application resource occurs (example: the signature has been withdrawn from the Subscription List).
FR 14.04	M	The notification will comprise a reference for resource accessing /the form of relevant business events that generated the notification (valid for the notifications stored on user interface).
FR 14.05	M	The notification will comprise a hypertext reference, where appropriate, to be used for accessing the form/record/entry that generated the notification.
FR 14.06	D	"ESL" ITSS will notify the System Administrator on all issues affecting the ITSS performance and availability.

5.1.15. UC15: Log Events

The functional requirements for the logging component of business events produced under the "ESL" ITSS workflows are mirrored in Table 5.15.

Table 5.15. Functional Requirements for Use Case UC15.

Identifier	Binding level	Description of Functional Requirements
FR 15.01	M	All business events produced during the "ESL" ITSS operation shall be logged through "ESL" ITSS internal mechanisms, platform service of CEC interoperability framework provided by SAISE Admin and MLog
FR 15.02	M	The following categories de events shall be logged: ■ user authentication; ■ user logout; ■ add/change/delete/access a record/entry; ■ initiate a Subscription List; ■ cancel the Subscription List; ■ sign the Subscription List; ■ withdraw signature from the Subscription List; ■ "ESL" ITSS events (changing metadata, user notification, managing users and their rights, etc.); ■ generate/access a report; ■ DB queries; ■ other specific business events.
FR 15.03	M	The logged events will save the following categories of data

Identifier	Binding level	Description of Functional Requirements
		(depending on the nature of the logged event): ■ "ESL" ITSS identifier in SAISE Admin; ■ identifier of the user who generated the event; ■ category of logged event; ■ time of logging the event (using the official timestamp) ; ■ "ESL" ITSS resource that generated the business event; ■ record/entry affected by the business event; ■ action performed by the user.
FR 15.04	M	"ESL" ITSS shall log exhaustively all business events produced through in-house logging mechanisms.
FR 15.05	M	"ESL" ITSS shall log in parallel all critical business events (for which the logging approach has been configured in the ITSS resources) through the logging service provided by SAISE Admin.
FR 15.06	M	"ESL" ITSS shall log in parallel all critical business events (for which the logging approach has been configured in the ITSS resources) through the government logging service MLog.

5.1.16. UC16: Synchronise Data

The functional requirements of "ESL" ITSS DB synchronising procedures with external IT System databases are displayed in Table 5.16.

Table 5.16. Functional Requirements for Use Case UC16.

Identifier	Binding level	Description of Functional Requirements
FR 16.01.	M	"ESL" ITSS shall use and expose interaction services with CEC ITSSs.
FR 16.02.	M	"ESL" ITSS shall perform synchronisation actions with SAISE Admin to access CEC platform services (authentication, authorisation, logging, etc.), common metadata of SAISE ITSSs and relevant data provided by SAISE ITSSs.
FR 16.03.	M	"ESL" ITSS shall perform synchronisation actions with CEC reports generation platform to retrieve documents, configured analytical and statistical reports.
FR 16.04.	M	"ESL" ITSS shall perform synchronisation actions with the SRV to retrieve/update Voters' identification, documentation and residence/domicile data who subscribed on Electronic Subscription Lists.
FR 16.05.	M	"ESL" ITSS shall perform synchronisation actions with "Subscription Lists" ITSS to receive the primary/baseline data necessary to initiate Electronic Subscription Lists and dispatch the data on Electronic Subscription List Signatories.
FR 16.06.	M	"ESL" ITSS shall perform synchronisation actions with CEC Official WEB page (https://www.cec.md) to publish access details to active Electronic Subscription Lists.
FR 16.07.	M	All synchronisation events, especially the ones related to accessing personal data through the procedure described by functional

Identifier	Binding level	Description of Functional Requirements
		requirements FR 16.02 - FR 16.06 shall be logged.

1.6. 5.2. IT System Non-functional Requirements

This ToR compartment sets forth the requirements on "ESL" ITSS non-functional features. The IT solution subject to this procurement has to correspond to the non-functional requirements outlines below.

5.2.1. General and Performance Requirements

The general system and performance requirements are defined by the policies and strategies developed and adopted in the Republic of Moldova. It is worth mentioning that these acts are stemming from the industry best practices and comprise many organizational measures, as well as a series of technical measures. The general system requirements specific for "ESL" ITSS are displayed in Table 5.17.

Table 5.17. The ITSS General System Requirements

Identifier	Binding level	Description of Requirements
TGEN 001	M	All User Interfaces and DB content shall be prepared in Romanian, using the Romanian diacritical marks.
TGEN 002	M	The User Interface elements shall comply with the Web Content Accessibility Guidelines (WCAG) 2.0 at Level A.
TGEN 003	M	The User Interface shall be optimised to 1360x768 resolution, avoiding the appearance of scrollbars for User Interfaces displayed by the IT solution.
TGEN 004	M	"ESL" ITSS shall have the possibility to customise/tailor the User Interface (it will deliver a responsive interface) depending on the device used by it (notebook, PC, smartphone, tablet, etc.).
TGEN 005	M	"ESL" ITSS shall ensure compatibility with W3C XForms standard.
TGEN 006	M	"ESL" ITSS shall be optimized in terms of minimal transfer of data between the client computer and server, with a special emphasis on avoiding to the extent possible the useless/redundant requests, implementation of AJAX with JSON, minimising the load of server resources necessary for authentication, authorisation and logging procedures.
TGEN 007	M	"ESL" ITSS shall have an architecture of at least three levels (with distinct level for data) based on SOA services.
TGEN 008	M	The potentially variable information of "ESL" ITSS (parameters, methods of data storage, methods of connection with external services, etc.) shall be configurable and not require solution recompilation or direct interventions into the DB.
TGEN 009	M	"ESL" ITSS shall use open standards for formats and communication protocols.
TGEN 010	M	The service parts displayed to the public by "ESL" ITSS shall be technologically neutral (Operating system, Internet browser, etc.).

Performance requirements specific for the "ESL" ITSS are displayed in Table 5.18.

Table 5.18. IT Subsystem Performance Requirements.

Identifier	Binding level	Description of Performance Requirements
PERF 001	M	The average time for server response shall not exceed three seconds upon the system nominal load.
PERF 002	M	The System shall enable concurrent activity for at least 500 users and concurrent servicing of at least 300 queries.
PERF 003	M	Prior to IT solution delivery, all "ESL" ITSS performance tests shall be conducted.
PERF 004	M	Performance testing shall include at least two components: system load testing and system stress testing.

5.2.2. Security and Protection Requirements

The IT Subsystem shall comply with the technical requirements imposed on IT Systems by the Moldovan Standard MS ISO/CEI 27002:2014 – Information Technology. Security Techniques. Code of best practices for information security management.

The IT solution shall comply with all Security and Protection Requirements displayed in Table 5.19.

Table 5.19. IT Subsystem Security and Protection Requirements.

Identifier	Binding level	Description of Security and Protection Requirements
SR 001	M	The IT System shall guarantee full storage and integrity of "ESL" ITSS DB content.
SR 002	M	Access to functions granted to unauthorised and non-authenticated Users shall be monitored using protection means against overstressing the service by one or several network hubs.
SR 003	M	All fields of forms filled in by Users must be validated by type on both client computer and server.
SR 004	M	The System shall be secured against OWASP Top 10 vulnerabilities.
SR 005	M	The System shall ensure confidentiality of data transmitted-received via communications channels.
SR 006	M	Access to the IT System shall be monitored.
SR 007	M	Access to functions for in-house Users shall be granted by their authentication, using User + Password or Active Directory (for CEC administrative roles) and electronic or mobile signature (for all ITSS roles).
SR 008	M	User authentication procedures shall be implemented via facilities offered by SAISE Admin and MPass.
SR 009	M	All Users' actions shall be entered into electronic logs.
SR 010	M	The System shall make a periodic sound signal that tells about its functional status.

5.2.3. Software, Hardware and Communication Channel Requirements

Table 5.20 contains all assurance requirements for software, hardware and communications technology laid down for "ESL" ITSS.

Table 5.20. Assurance Requirements for ITSS Software, Hardware and Communications Technology.

Identifier	Binding level	Description of Requirements for Software, Hardware and Communications Technology Solutions
SHC 001	M	The IT solution shall be developed based on the following platform constraints: ■ Windows Server 2012 R2; ■ IIS 8; ■ .NET 4.5, ■ MS SQL Server 2017 Enterprise R2.
SHC 002	M	"ESL" ITSS shall have the possibility to be installed on both dedicated servers and on virtual solutions.
SHC 003	M	It is necessary to demonstrate the capacity of virtualization via the delivery of a system image to the Beneficiary that could be uploaded and become operational with minimum configurations on one of the virtualization solutions available on the market.
SHC 004	M	"ESL" ITSS should be accessible through communication channels of at least 128kbps.
SHC 005	M	To develop the IT Subsystem it is envisaged to apply the technologies used in the process of developing the existing components of SAISE.
SHC 006	M	"ESL" ITSS shall be capable to be virtualized at the software-hardware level.
SHC 007	M	"ESL" ITSS shall be tolerant to errors by offering support for clustering and fail over for the whole platform and own components.
SHC 008	M	It is required that the service parts exposed to the public be technologically neutral.
SHC 009	M	Verification shall be done through using a set of (modern) platforms expecting that the performance parameters are similar or even better than the benchmarking configuration parameters.
SHC 010	M	WEB Explorer is the generic software recommended for operation and interaction with "ESL" ITSS.
SHC 011	M	The IT Subsystem shall be compatible with at least two the most recent versions of the following WEB browsers: Microsoft Internet Explorer/MS Edge, Mozilla Firefox, Google Chrome, Safari, and Opera.
SHC 012	M	Compatibility with WEB MS Internet Explorer/MS Edge is binding.
SHC 013	D	"ESL" ITSS shall incorporate a Heart-beat service to periodically communicate the system normal work status.
SHC 014	M	"ESL" ITSS shall include configurable means for technical logging.
SHC 015	M	"ESL" ITSS shall be able to produce at least the following levels of technical logging: info; warning; critic; error.

Identifier	Binding level	Description of Requirements for Software, Hardware and Communications Technology Solutions
SHC 016	M	The Developer shall list the means to be used for system troubleshooting.
SHC 017	M	The Developer shall prepare means that facilitate the system administration functions: ■ starting the system components; ■ stopping the system components; ■ restarting the system components; ■ making the DB back-up, ■ restoring the data from the aforementioned back-up, ■ refreshing the system operating memory.
SHC 018	M	The IT Subsystem will operate in TCP/IP networks and, especially, in HTTPS.
SHC 019	M	The Developer shall suggest other network services and utilities necessary for system operation.

5.2.4. Information Technology related Matters and Industry Initiatives

The requirements put forward regarding the information technology related matters and industry initiatives in force on the territory of the Republic of Moldova are laid down in Table 5.21.

Table 5.21. Requirements regarding Information Technology related Matters and Industry Initiatives.

Identifier	Binding level	Accepted Initiative Description
INI 001.	M	"ESL" ITSS will use platform service MPass as an authentication mechanism to authenticate via Electronic or Mobile Signature and the authentication mechanism provided by SAISE Admin.
INI 002.	M	"ESL" ITSS will use the authorisation service provided by SAISE Admin as authorisation mechanism.
INI 003.	M	"ESL" ITSS will use platform service MSign as a mechanism for affixing and validating the electronic signature.
INI 004.	M	"ESL" ITSS will incorporate platform service MLog as critical event logging mechanism, as well as the logging service provided by SAISE Admin.

5.2.5. IT System Documentation Requirements

The IT solution shall be accompanied by an IT System full package of documentation comprising the compartments displayed in Table 5.22.

Table 5.22. "ESL" ITSS Documentation Requirements.

Identifier	Binding level	Description of Documentation Requirements
DOC 001	M	The Developer shall prepare and publish **Interactive Guidance Materials** included in the "ESL" ITSS User's Interface.

Identifier	Binding level	Description of Documentation Requirements
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 the "ESL" ITSS **Testing Scenarios** intended for its pre-acceptance and final acceptance.
DOC 006	M	The Developer shall prepare and deliver the **Guide on "ESL" ITSS Installation and Configuration** (to include at least guidelines for code compilation, installation of application, hardware and software requirements, platform description and configuration, application configuring, and disaster recovery procedures).
DOC 007	M	The Developer shall prepare and deliver the **"ESL" ITSS Architecture Documentation** with the description of models in UML language, to include a sufficient level of details in terms of Architecture in several cross-sections (including the data logical and physical models).
DOC 008	M	The Developer shall prepare and deliver **API documentation** exposed to be integrated with other IT Systems.
DOC 009	M	The Developer shall deliver the **Source Code** for applications and components developed under the Project.

5.2.6. IT System Maintenance Requirements

The Developer shall ensure post-delivery warranty period and technical support comprising the compartments included in Table 5.23.

Table 5.22. "ESL" ITSS Warranty and Technical Support Requirements.

Identifier	Binding level	Description of Warranty and Technical Support Requirements
GMS 001	M	The Developer shall offer warranty and technical support for 12 months following the IT System acceptance.
GMS 002	M	The warranty and technical support shall meet the National Standard MS ISO/CEI 14764:2015 – Software Engineering. Software Life Cycle Processes – Maintenance.
GMS 003	M	The Beneficiary shall report all technical issues that could occur through a ticketing mechanism, E-mail or instant message.
GMS 004	M	The Developer shall ensure support to document the technical issues and their traceability for the Beneficiary.
GMS 005	M	The deadline for response and remedying the reported issues should be eight working hours at most following their reporting.
GMS 006	M	For major complexity issues the remediation period shall not exceed 72 hours.

Identifier	Binding level	Description of Warranty and Technical Support Requirements
GMS 007	M	The Developer shall prove its ability to provide post-delivery technical support in compliance with the requirements of GMS 001-GMS 006.
GMS 008	M	Upon signing the "ESL" ITSS final acceptance acts, the Developer shall sign with CEC a SLA, which would detail the mechanism for rendering warranty, technical support and maintenance services for "ESL" ITSS over 12 months.

6. End-product and Delivered Components

The end-product ("ESL" ITSS) is composed of software artefacts and system documentation, as well as of knowledge transfer to the system Possessor and Administrator. "ESL" ITSS-related artefacts are displayed in Table 6.1.

Table 6.1. Artefacts delivered for "ESL" ITSS.

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 (for all roles except for System Administrator).
DELIV 006	M	Administrator's Manual (including a contingency plan).
DELIV 007	M	Training documentation (intended for trainers who would train the users in operating the IT solution).
DELIV 008	M	Pre-acceptance and final acceptance testing scenarios.
DELIV 009	M	Technical specifications for the published and used interfaces.
DELIV 010	M	SLA for rendering post-implementation warranty, maintenance and technical support services.
DELIV 011	M	All artefacts copied on electronic medium (CD-R or DVD+-R).

In addition to the artefacts related to "ESL" ITSS deliverables, all services necessary for knowledge transfer displayed in Table 6.2 shall 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 System Administrator role, four system users assigned with the EMD Official role and 40 users assigned with PP user role).
DELIV 013	M	Assistance during the IT Subsystem pilot testing period.
DELIV 014	M	Assistance in IT Subsystem acceptance testing.
DELIV 015	M	Assistance in putting the IT Subsystem in production.
DELIV 016	M	Solving the deficiencies identified during the pilot period and acceptance testing.
DELIV 017	M	Post-implementation technical support (after putting the system in production) for a 12-month period, including corrective, adaptive and preventive maintenance, in compliance with MS ISO/CEI 14764:2015.

7. IT Subsystem Implementation Stages

The overall contract duration for "ESL" ITSS designing, building, testing and implementation shall not exceed that of six months (excluding the 12-month warranty and maintenance period), and be done in compliance with the following schedule:

1. **"ESL" ITSS development stage**, which shall be subdivided into the phases coordinated with the CEC as follows:

    a. The Developer proceeds with considering the Terms of Reference, Scope of Work and with due approval of the direct Beneficiary (CEC) proposes its vision with regards to developing the information 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 integration of 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 Specifications), which subsequently will be improved until signing the IT Subsystem final acceptance. The stage in question shall not exceed four months;

    c. The Developer proceeds with testing the IT Subsystem in laboratory mode (in-house testing) and prepares a set of accompanying documentation (presented shall be the functionalities of the system complete with corrections and adjustments made during 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 procedure is bound to comprise the following stages:

        - applied to the IT Subsystem shall be stress and load testing scenarios with the purpose of checking the level of its compliance with the CEC expectations;
        - the Developer shall obtain the results of load and stress testing based on which, if necessary, shall introduce all required adjustments and changes, thus, preparing an improved version of the software product;
        - applied to the improved version of IT Subsystem shall be stress and load testing scenarios with the view of checking its compliance with CEC expectations. If necessary, direct improvements shall apply until all of the traced out problems are cleared.

2. **The "ESL" ITSS implementation stage** shall begin once the acceptance protocol has been approved by CEC in the submitted variant and the statement of acceptance in experimental operation has been signed. The IT solution implementation shall last for maximum two months.

3. **The Training Stage** shall start concomitantly with the implementation of the IT solution and cover training of two system users assigned with System Administrator roles, four system users assigned with the EMD Official roles and 40 users assigned with PP user roles.

4. **The "ESL" ITSS commissioning** shall begin with signing the IT System Commissioning Statement and starting its operation.

5. **The "ESL" ITSS Warranty and Maintenance Stage** is the period during which the Developer shall undertake relative to CEC to assist in maintaining the IT System capacity 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 "ESL" ITSS we believe that an initial 12-month period shall suffice.

8. Project Organization Requirements

In order to organize the contract assignment, the Bidder shall appoint a Project Manager in charge of the team. The latter shall comprise at least the following key professionals holding the following minimum qualifications:

1. **Project Manager (1 person) –** responsible for the co-ordination of the whole ICT Consultancy mission and for ensuring the quality of the deliverables:
   - University degree in Management, Engineering, ICT or another relevant field to the proposed assignment (Pre-Bologna System)/Master's Degree (Bologna System) or higher;
   - At least 5 (five) years of experience in project management of projects on developing IT applications/systems, services, etc;
   - Experience in a similar position in at least 2 (two) similar software development projects using agile approach;
   - Proven certification in Project Management (Prince, PMI, etc.) would be an asset;
   - Experience in managing projects for public authorities would be an advantage;
   - Proficiency in Romanian and English languages.
2. Senior Software Developer / Technical Lead (at least 1 person)
   - University degree in Computer Science or another relevant field to the proposed assignment (Pre-Bologna System)/Master's Degree (Bologna System) or higher;
   - At least 5 (five) years of experience in software development;
   - Participated in at least 2 (two) software development projects in the last 3 years using agile approach;
   - At least 3 years of experience in software development using C#, Entity Framework, ASP.NET MVC, SQL Server and a dependency injection framework;
   - Certifications in any technology from the required technology stack mentioned above is an asset;
   - Proficiency in Romanian and English languages.
3. Software analyst (at least 1 person)
   - University degree in Computer Science or another relevant field to the proposed assignment (Pre-Bologna System)/Master's Degree (Bologna System) or higher;
   - At least 5 (five) years of experience in software development;
   - Participated in at least 2 (two) software development projects in the last 3 years using agile approach;
   - Experience in implementing projects for public authorities would be an asset;
   - Certifications in any technology from the required technology stack (i.e. C#, Entity Framework, ASP.NET MVC, SQL Server and a dependency injection framework) would be an advantage;
   - Proficiency in Romanian and English languages.

The proposal shall include the suggested management organizational structure, with the argumentation of the choice, proving its appropriateness relative to the assignment objectives and implementation environment. The Project Manager shall be assigned at least with the following duties within the Project:

- ensure proper Project risk management, the quality of deliverables and control the progress achieved at each assignment phase;
- ensure control of interdependency of assignment components to minimize any stagnation risk;
- ensure efficient communication within the team and the stakeholder structure by setting, at least, progress reporting on a weekly basis;
- ensure adequate management transparency through accurate documentation of all management matters.

The Bidder shall submit as part of its Proposal the Project initiation draft documents to include the following (at the very least):

1. Organizational structure envisioned for the assignment;
2. Assignment Plan;
3. Communication Plan;
4. Quality Plan;
5. Progress monitoring process;
6. Deliverables acceptance plan;

When subcontracting the activities for producing certain deliverables, the Bidder shall submit the Work Packages related to those activities. The Work Package structure shall contain: the date, responsible person, overall description, description of deliverables that are part of the Work Package concerned, methods employed to check the quality, the level of resources to be allocated, the beginning and the ending dates, constraints, the reporting manner.

The Work Packages to be subcontracted shall be signed and submitted by both the Offeror and the proposed Subcontractor.

Annex 1. Subscription List for Referendum

_____

tipul referendumului

LISTA DE SUBSCRIPŢIE nr. 000000

Primăria satului (comunei)/oraşului (municipiului) _____, raionul/municipiul/UTA Găgăuzia _____

Întrebarea preconizată a fi supusă referendumului: _____

Extrasul din Proiectul de lege (după caz) _____

_____

Nr. curent	Numele susţinătorului referendumului	Prenumele susţinătorului referendumului	Data naşterii	Domiciliu	Actul de identitate	Data semnării	Semnătura susţinătorului referendumului	Notă

Annex 2. Subscription List for a candidate

_____

tipul alegerilor

LISTA DE SUBSCRIPŢIE nr. 000000

_____ _____ 20___

Pentru funcția electivă: _____ Profesia (ocupația): _____

Numele și prenumele candidatului: _____ Funcția: _____

Anul nașterii: _____ Locul de muncă: _____

Domiciliul: _____ Apartenența politică _____

Primăria satului (comunei)/orașului (municipiului): _____, raionul/municipiul/UTA Găgăuzia _____

Circumscripția uninominală: _____ nr. _____

Nr. curent	Numele susținătorului referendumului	Prenumele susținătorului referendumului	Data nașterii	Domiciliu	Actul de identitate	Data semnării	Semnătura susținătorului referendumului	Notă