

TERMS OF REFERENCE

**For developing the Information System “Energy Vulnerability
Fund”**

Introduction

Since early March 2020, the Republic of Moldova is confronting a complex health and socio-economic crisis induced by the COVID-19 pandemic. As summarized in the SEIA, the crisis is underscoring the importance of LNOB challenges in Moldova, due to shrinking incomes and expenditures, limited access to health and education, and challenges for local businesses due to supply disruptions and plummeting demand at home and abroad. According to recent IMF projections, Moldova's GDP decreased during 2020-2021 by about 3%; and as of October 29, 2021, only 14% of the population had received at least one COVID-19 vaccinations.

During the second half of 2021, these developments played out against a backdrop of the European gas crisis, when gas prices spiked above \$1000/cubic meter (5-10 times 2020 levels). Moldova's gas import contract with Russia's Gazprom expired in October 2021; and with a new negotiated contract, Gazprom will supply Moldova gas at a price of about \$450-500/1000 cubic meters. Gas tariffs for most users are expected to double or triple—at a time when the country is experiencing the fourth wave of the COVID-19 pandemic, and when heating needs are ratcheting up in the face of the on-coming winter.

Moldova is therefore facing exorbitant prices for those supplies it can obtain. For a country in which nearly two thirds of the population was living on less than \$10/day before the pandemic began, in which spending on food and energy absorb the vast majority of vulnerable household incomes, and which generates the lion's share of its electricity from gas, this price shock can have significant crisis implications. Combined with the country's on-going macroeconomic and epidemiological distress, the gas shock also poses major risks to the government's reform program, which seeks to strengthen Moldova's alignment with European and global good governance practices and is central to Moldova's hopes for achieving the SDGs.

In response to this unfolding crisis, **the Moldovan Government introduced a State of Emergency on October 22, 2021 and has requested UNDP assistance**. It is seeking to procure additional gas supplies from alternative suppliers, to switch (where possible) from gas-fired boilers to other heating sources, and to strengthen the social protection system's ability to respond to energy poverty. But following two years of pandemic-induced extraordinary budget expenditures, Moldova's fiscal space is extremely limited, and the resources required to support vulnerable population groups have to be sourced from external partners. (So far, the EU has pledged €60 million in grant financing). Moreover, in addition to its socio-economic impact, the gas price shock can deplete Moldova's natural capital and worsen health conditions, as many vulnerable households are likely to rely more on coal, firewood, and other biofuels, worsening problems of deforestation and air pollution. At same time, better targeting of vulnerable households through appropriate social protection responses can limit the impact of the gas price shock on vulnerable households.

UNDP provided assistance to the Government to create a new energy subsidy system and additional assistance is needed to create an IT platform to support this effort starting with 2022/2023 heating season.

The Energy Vulnerability Fund (EVF) of the Ministry of Labour is under development to respond to energy crisis Moldova is facing by making the energy subsidy system operational.

To ensure the efficient activity of the EVF, it is appropriate to implement an IT solution that would be able to ensure the applicability of the energy subsidy system to energy poor citizens of Moldova, as well as would provide possibilities to set up and adjust methodological and legal changes to assist the Ministry of Labour in this effort.

For this purpose, *the UNDP Moldova Digital Transformation Programme* provides financing for developing and implementing the Information System "*Energy Vulnerability Fund*" which will be procured for the

Ministry of Labour for the purpose of ensuring efficient information support for an efficient electronic energy subsidy system.

The present document provides a conceptual vision for setting up and operating an information system meant for the implementation of the EVF, including aspects related goal and objectives, principles, main characteristics, functionality and conceptual architecture, functional and non-functional requirements of the information system.

In this regard, a brief description is provided for the basic components of the future solution, pointing out the principles and functionalities to be taken into consideration when developing every component.

1. General information

Terms used in technical specifications

The main acronyms and abbreviations used in the present document are provided in Table 1.1.

Table 1.1. Abbreviations and acronyms used in the document

| No. | Abbreviation/Acronym | Description |
|-----|----------------------|---|
| 1. | PSA | Public Services Agency |
| 2. | DB | Database |
| 3. | COTS | Commercial off-the-shelf |
| 4. | ESB | Enterprise Service Bus. Line of corporate services meant to orchestrate information exchange among applications. |
| 5. | KPI | Key Performance Indicators |
| 6. | MOL | Ministry of Labour |
| 7. | QBE | Query by Example represents a method of interpellation to the database using a native text syntax. The main advantage is lack of some specific requirements for the information demand structure |
| 8. | RCFI | Register of Criminal and Forensic Information |
| 9. | SRP | State Register of Population |
| 10. | SDD | Software design document. |
| 11. | DMS | Database management system |
| 12. | IS | Information System |
| 13. | AIS MAO | Automated Information System "Management of Administrative Offences" |
| 16. | SLA | Service Level Agreement |
| 17. | SPOF | Single Point of Failure |
| | IS "EVF" | Information System "Energy Vulnerability Fund" |
| 18. | ISS | Information Subsystem |
| 19. | ITS | Information Technologies Service |
| 20. | TOGAF | The Open Group Architecture Framework (methodology for developing complex architectures providing design visions, planning, implementation and governance of ICT architectures under corporate information solutions) |
| 21. | SRS | Software Requirements Specification |
| 22. | SPOF | Single Point of Failure |
| 23. | IT | Information Technology |
| 24. | ICT | Information and Communications Technology |

| No. | Abbreviation/Acronym | Description |
|-----|----------------------|--|
| 25. | TLS/SSL | TLS Protocol or its predecessor, SSL Protocol, are cryptographic protocols which ensure safe communication between nodes of computer network for such actions as visiting web pages, e-mail, internet-fax, exchange of instant messages, and other data transfers. |

The definitions of the frequently used terms in this document are provided in Table 1.2.

Table 1.2. Definitions and terms used in the document

| No. | Abbreviation/Acronym | Description |
|-----|--------------------------|---|
| 1. | Database | Set of organized data according to a conceptual structure which describes the basic characteristics and the relation between entities |
| 2. | Credentials | Set of attributes which establish the identity and authentication of users and systems within information systems. |
| 3. | Data | Elementary information units about persons, subjects, facts, events, phenomena, processes, objects, situations, etc. presented in a form that would allow their notification, comments and processing. |
| 4. | Personal data | Any information regarding the identified or identifiable natural person (subject of personal data). In this respect, an identifiable person is a person which may be identified, directly or indirectly, especially by referring to an identification number or to one or more specific events related to its physical, physiological, psychological, economic, cultural or social identity |
| 5. | Data integrity | State of data, when they preserve their content and are interpreted univocally in case of random actions. Integrity is considered to be preserved, if data are accurate and reliable. |
| 6. | Logging | A function of registering information about events. The logs about events within information systems include details about date and hour, user, identified personal data, undertaken action. |
| 7. | Metadata | Modality of attributing semantic value to data stored in the database (data about data). |
| 8. | Information object | Virtual representation of existing material and nonmaterial entities. |
| 9. | Information resource | Set of information documented in the information system, maintained in line with the requirements and legislation in force |
| 12. | Computer/ IT system | Set of programs and equipment ensuring automated processing of data (automated component of the information system). |
| 13. | Information system | System for processing information, together with the related organization resources which supply and distribute information. |
| 14. | Software design document | Directory document of the information system, which covers the detailed description of the following vision: data structures and |

| No. | Abbreviation/Acronym | Description |
|-----|---|--|
| | | their constraints, information system architecture, which provides all the conceptual sections of the information system, the interface of the information system covering the conceptualization of all components of user interface of the information system, functionalities of the information system, which covers the detailed description of all the information system implementation scenarios. |
| 15. | Software Requirements Specification | Document that contains the detailed description of all scenarios of interaction between users and information application. |
| 16. | Information subsystem | Component part (with the possibility of functional decoupling) of a complex information system. |
| 17. | Information and Communications Technology | Common term which includes all the technologies used for exchange and manipulation of information. |
| 18. | Data accuracy | The level of data (which are stored in computer memory or in documents) compliance with the real condition of items in the respective area of the system, reflected by these data. |

References and legal aspects for developing the information system

Analyzing the normative-legislative framework in force in the Republic of Moldova, a number of acts may be pointed out, the provisions of which should be taken into consideration when developing the *IS „EVF”*. To develop, implement and operate the *IS „EVF”*, a set of normative acts was identified, being grouped depending on the applicability level, as follows:

- acts which regulate business processes related to the activity of the MOL;
- acts which regulate ICT initiatives and technologies promoted by the Republic of Moldova, to be considered when implementing the information system;
- general acts related to design, implementation and operation of an information system.

I. Acts regulating business processes in the REC activity:

The following legislative, normative and departmental acts may be delimited according to *IS „EVF”*:

1. *Labor Code of the Republic of Moldova No. 154 of 28.03.2003*, Official Gazette no. 159-162 of 29.07.2003.
2. *Law no. 158 of 04.07.2008 on Public Office and Status of Civil Servants*, Official Gazette No. 230-232 of 23.12.2008.
3. *Law No. 82 of 25.05.2017 on Integrity*, Official Gazette No. 229-243 of 07.07.2017.

II. Acts regulating the ICT initiatives of the Republic of Moldova:

While developing the *IS „EVF”*, we consider it appropriate to take into consideration and to implement the requirements and recommendations covered in the normative-legislative acts on ICT initiatives of the Republic of Moldova. The following acts should be taken into consideration to observe the electronic governance framework in force:

4. *Government Decision No. 945 of 05.09.2005 on public keys' certification centers*, Official Gazette No. 123-125 of 16.09.2005.

5. *Government Decision No. 320 of 28.03.2006 approving the Regulation on how to apply digital signature on electronic documents of public authorities*, Official Gazette No. 51-54 of 31.03.2006.
6. *Government Decision No. 7104 of 20.09.2011 approving the Strategic Program for governance technological modernization (e-Transformation)*, Official Gazette No. 156-159 of 23.09.2011.
7. *Government Decision No. 188 of 03.04.2012 on official pages of public administration authorities on Internet*, Official Gazette No. 70-71 of 06.04.2012.
8. *Government Decision No. 656 of 05.09.2012 approving the Program on Interoperability Framework*, Official Gazette No. 186-189 of 07.09.2012.
9. *Government Decision No. 1090 of 31.12.2013 on electronic governmental service of access authentication and control (MPass)*, Official Gazette No. 4-8 of 10.01.2014.
10. *Government Decision No. 128 of 20.02.2014 on common governmental technological platform (MCloud)*, Official Gazette No. 47-48 of 25.02.2014.
11. *Government Decision No. 405 of 02.06.2014 on integrated electronic governmental service of digital signature (MSign)*, Official Gazette No. 147-151 of 06.06.2014.
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. 700 of 25.08.2014 on open governmental data*, Official Gazette No. 256-260, of 29.08.2014.
14. *Government Decision No. 701 of 25.08.2014 approving the methodology for publishing open governmental data* No. 256-260 of 29.08.2014.
15. *Government Decision No. 708 of 28.08.2014 on logging governmental electronic service (MLog)*, Official Gazette No. 261-267 of 05.09.2014.
16. *Law No. 142 of 19.07.2018 on exchange of data and interoperability*, Official Gazette No. 295-308 of 10.08.2018.
17. *Government Decision No. 211 of 03.04.2019 on interoperability platform (MConnect)*, Official Gazette No. 132-138 of 12.04.2019.
18. *Government Decision No. 375 of 10.06.2020 approving the Concept of Automated Information System "Register of representation powers based on electronic signature" (MPower) and of the Regulation on how to keep the Register of representation powers based on electronic signature*, Official Gazette No. 153-158 of 26-06-2020.

The conceptualization, development and implementation of the IS „EVF“ should be carried out in line with the national standards and methodology, and the recommendations and requirements set forth in the ICT sector. Hence, the following regulations and standards should be considered:

19. *Republic of Moldova Standard MR ISO/CEI/IEEE 15288:2015, "Systems and software engineering. System life cycle processes"*.
20. *The Handbook on "Information and Communication Technologies in Parliamentary Libraries"*, Global Centre for Information and Communication Technologies in Parliament, July, 2012), https://www.usability.gov/sites/default/files/documents/guidelines_book.pdf
21. Michael O. Leavitt, Ben Shneiderman, *Research-Based Web Design & Usability Guidelines*, https://www.usability.gov/sites/default/files/documents/guidelines_book.pdf
22. *World Wide Web Consortium (W3C) Recommendations* (<http://www.w3c.org>) on quality of web pages' content, possibilities to view correctly the information, using widely used Internet explorers and compatibility with different information platforms.

23. WAI (*Web Accessibility Initiative*) Recommendations (<http://www.w3c.org/WAI>) on ensuring the possibility to use sites' resources by persons with disabilities.
24. WCAG (*Web Content Accessibility Guidelines*) Recommendations <http://www.w3.org/TR/WCAG21/>
25. W3C Recommendations (<http://validator.w3.org>) on testing WEB pages. All the WEB pages generated by the US „EVF“ will be tested in line with these recommendations.

The IS „EVF“ will not be isolated, but will interact with the information systems of other central public authorities of the Republic of Moldova. Hence, it is appropriate to use the governmental interoperability platform/ governmental service to perform data exchange with third information systems.

Additionally, the interoperability *MConnect* governmental service allows performing system-system type interaction not only among the information solutions hosted in *MCloud*, but also with information services providers hosted outside *MCloud*. In context with IS „EVF“, *MConnect* will serve as a platform/ governmental service through which the interaction will be carried out with the existing information systems so as to take over, verify and insert automatically data in the business processes of the REC.

III. General acts related to developing, producing and operating information systems:

Besides the legal and normative acts to be used as basis for developing and implementing the information solution meant for implementing the IS „EVF“, a set of normative-legislative acts should be taken into consideration, which impose organizational measures and external constraints for the operation of the information system. The following may be mentioned under this category of acts:

26. *Law No. 982 of 11.05.2000 on Access to information*, Official Gazette No. 88 art. No. 664 of 28.07.2000.
27. *Law No. 1069 of 22.06.2000 on Informatics*, Official Gazette No. 073 of 05.07.2001.
28. *Government Decision No. 735 of 11.06.2002 on special telecommunication systems of the Republic of Moldova*, Official Gazette No. 79-81 of 20.06.2002.
29. *Law No. 467 of 21.11.2003 on computerization and state information resources*, Official Gazette No. 6-12/44 of 01/01/2004.
30. *Government Decision No. 840 of 26.07.2004 on creating the telecommunication system of public administration authorities*, Official Gazette No. 130 of 30.07.2004.
31. *Technical Regulation "Software life cycle processes" RT 38370656-002:2006*; Official Gazette No. 95-97/335 of 23/06/2006.
32. *Law No. 71 of 22.03.2007 on Registers*, Official Gazette No. 70-73 of 25.05.2007.
33. *Law No. 241 of 15.11.2007 on Telecommunications*, Official Gazette No. 51-54 of 14.03.2008.
34. *Order No. 94 of 17.09.2009 of the Ministry of Information Development approving some technical regulations (the record keeping of electronic public services, provision of electronic public services, ensuring information security when providing electronic public services, determination of costs for developing and implementing automated information systems)*, Official Gazette No. 58-60 of 23.04.2010.
35. *Law No. 133 of 08.07.2011 on protection of personal data*, Official Gazette No. 171-175 of 14.10.2011.
36. *Government Decision No. 1123 of 14.12.2010 approving the requirements for ensuring personal data security when processing them within information systems of personal data*, Official Gazette No. 254-256 of 24.12.2010.

An important legal restriction to be observed is ensuring security of personal data managed via the *IS „EVF“*. The *Law No. 133 of 08.07.2011 on protection of personal data* stipulates the binding nature of ensuring confidentiality of personal data. In case of the *IS „EVF“*, this would be personal data of special category, which need the implementation of tougher protection measures.

Moreover, in line with this law, the owner of the *IS „EVF“* is obliged to register the *IS „EVF“* in the *State Register of Personal Data Operators* which is managed by the *National Center for Personal Data Protection*.

Principles for developing an information system

For the purpose of ensuring the objectives set for the *IS „EVF“*, the following general principles should be considered when designing, producing and implementing it:

- **Principle of legality:** implies setting up and operating the information system in line with the national legislation and international norms and standards recognized in the area.
- **Principle of focusing on stakeholders' needs** which implies that the information solution will supply complete functional capabilities to meet the needs of all stakeholders interested in human resources' evaluation processes.
- **Principle of decoupling the technological platform** which ensures that *IS „EVF“* will not be conditioned by selection of the technological platform based on which it will be implemented. The independence of the technological platform implies that the *IS „EVF“* will be able to be implemented and operated on a variety of technologies accessible for MOL, selecting the best technological option. Thus ensuring the rational use of available ICT resources and intelligent investments in ICT.
- **Principle of dividing the architecture by levels:** implies designing and implementing the functional components of the *IS „EVF“* in line with the interface standards between levels;
- **Principle of service oriented architecture (SOA)** which implies distribution of functional components of the information system into smaller, distinct components – called services – which may be distributed into a network and may be used together to create applications meant to implement the business functions of the information system. These components will be able to be implemented without rigid mutual dependencies and will interact through external interfaces implemented based on open and independent standards of technology. This fact provides flexibility to choosing technologies and independent life cycles for components of the *IS „EVF“*. It will also allow the stakeholders to select alternative technological options for capabilities to introduce and access data.
- **Principle of reusing existing capabilities** which implies that the *IS „EVF“* will be implemented by reusing at the level of its components the current ICT capabilities to which MOL has access. The development of new capabilities specific for the *IS „EVF“* will be performed only in case when they are missing in the current ICT architecture of MOL (preserving the SOA architecture and ensuring the possibility of reusing these capabilities by other systems, where possible). This fact implies the use of governmental platform services or of platform solutions implemented within MOL, for developing the components which are setting the *IS „EVF“*.
- **Principle of aligning to the wide-scale of ICT architecture of MOL** which implies that the place of the *IS „EVF“* in wide-scale ICT architecture is explicitly delimited from other systems. The *IS „EVF“* should be implemented applying the principle of ICT architecture established by MOL and should be able to interact with other components of the ICT architecture. At their turn, the ICT architecture principles are aligned to the principles of governmental architecture.
- **Principle of open and interoperable data model** which implies that the data model supported by the *IS „EVF“* is documented and communicated to all stakeholders. The *IS „EVF“*

should be developed based on the good standards in the area and aligned to the governmental and departmental data model (adoption of already existing taxonomy and semantics at the national and departmental levels and their enrichment to meet the specific needs in the area of HR evaluation).

- **Principle of security through design** which implies the design of the *IS „EVF“* with knowledge regarding the information security risks that may impact the good functional of the information system. The legal requirements applicable for personal data protection shall be considered when designing the *IS „EVF“* and implemented at the development stage. The *IS „EVF“* will ensure the controlled, transparent and responsible access to information.
- **Principle of integrity, completeness and accuracy of data:** implies the implementation of mechanisms which would allow preserving the content and the univocal interpretation of data in conditions of accidental influences and elimination of phenomena that would distort or liquidate them accidentally, supply of a volume of sufficient data for carrying out business functions of the information system and ensuring a high level of data compliance with the real condition of objects they represent and which are part of the Integrated Management System.
- **Principle of accessibility of public information:** which implies the implementation of procedures to ensure access of applicants to public information provided by the information solution.
- **Principle of expansibility:** stipulates the possibility of extending and completing the information system with new functions or improving the existing ones;
- **Principle of the first persons/single center priority:** implies the existence of a responsible person of high level, with sufficient rights to take decisions and coordinate activities for setting up and operating the information system;
- **Principle of scalability:** implies ensuring constant performance of the information solution when the volume of data increases and the demand for the information system goes up;
- **Principle of simplicity and convenience in use:** implies the design and implementation of all applications, technical means and program means accessible to users of the *IS „EVF“*, based on exclusive visual, ergonomic and logical principles of conception.

Destination, objectives and tasks of the information system

The information system is meant to automate the business processes for energy subsidy system for Moldova. Based on the existing legislative basis and objective needs of the MOL, the following objectives may be determined for be achieved after implementation of the *IS „EVF“*:

- development of a secure and reliable electronic energy subsidy system for Moldova;
- elimination of direct human factor in the defining the energy poverty category for citizens of Moldova;
- implementation of a reliable and efficient system of electronic management of documents, extended by a set of procedures for automation of work flows, which would ensure rapid delivery of documents and monitoring the observance of execution deadlines;
- reducing the image risks caused by delays, contradictory messages or actions due to deficit of information from decision makers;
- increase of transparency in the activity and quality of the decision-making process in the energy subsidy system of Moldova;
- supply of authentic, accurate, current and consistent information to all stakeholders involved in the relevant business processes of the *IS „EVF“*;

- reducing the response time and ensuring the information support for decision-making process;
- rapid and guaranteed access to data regardless of the location of the authorized user;
- continuous and prompt information of population regarding the business processes carried out in the *IS „EVF”* (appropriate supply of open data extracted based on the business processes automated by the *IS „EVF”*);
- standardization of data, messages and actions in institutions, subdivisions and representations with authorized access to the *IS „EVF”*;
- reducing operational costs, increasing quality and diversity of communication means.

The primary goal of the *IS „EVF”* is to develop a platform through which it would be possible to unify and centralize the national energy subsidy system for Moldova. At the same time, the information system will implement the work flows meant to conclude and process all the documents related to business events specific for human resources' evaluation.

The main advantage of the *IS „EVF”* is the fact that in future, all related energy subsidies will be carried out through electronic work flows of the *IS „EVF”* hence eliminating the need to conclude traditional hardcopy documents. All the interactions among stakeholders, including among the relevant institutions will be carried out electronically.

For anonymous users, the *IS „EVF”* will generate sets of depersonalized public data (aggregated statistics, performance indicators, etc.) which will periodically publish in an automated way in the *Open Data Portal*.

2. Architecture of the information system

The IS „EVF” should supply a web interface, accessible through an Internet explorer of wide use (*MS Internet Explorer/MS Edge, Mozilla FireFox, Opera, Google Chrome or Safari*). From functional point of view, a reliable solution will be developed to be scalable both, in case of increasing number of concurrent users, or in case of increasing volume of information managed by the system.

Because the IS „EVF” is not an isolated computing solution, but will interact with other information systems of different public authorities of the Republic of Moldova, the development information system should provide support for integration with third-parties’ information systems.

The basis of the IS „EVF” will be a client-server architecture of minimum 3 levels (which excludes direct interaction of the application with the database) based on adequate WEB technologies from time point of view. To ensure an adequate level of information security, the respective information system should allow a secured connection between the client spaces and application server to ensure a safety level for sent information (through VPN channels and TLS/SSL sessions).

The IS „EVF” will be installed and will function within the governmental service *MCloud*.

The solution of cooperating the resources for ensuring the functionality of the IS „EVF” covers 5 categories of distinct nodes:

- **MCloud** – ICT infrastructure of the common governmental technological platform, which sets up the governmental cloud (*MCloud*), which is usually hosting all the information systems of the PA in the Republic of Moldova, and where the IS „EVF” will be hosted. It should be mentioned that the IS „EVF” will consume *MCloud* governmental service. All the connections with external information systems will be mainly carried out through *MConnect* governmental interoperability platform.
- **MOL ICT Infrastructure** – - the ICT infrastructure of the *Ministry of Labour* (located outside *MCloud*), where the, IS „_____” is hosted. The IS „EVF” will not interact directly with these information systems. The interaction will be carried out through *MConnect* interoperability platform/ governmental service.
- **ICT infrastructure of PSA** – the ICT infrastructure of the *Public Services Agency* hosting the *State Register of Population*. The IS „EVF” will not interact directly with this information system. The interaction will be carried out through *MConnect* interoperability governmental service.
- **ICT infrastructure of NAC** – the ICT infrastructure of the *National Anticorruption Center* hosting the IS „EVF”. The IS „EVF” will not interact directly with this information system. The interaction will be carried out through *MConnect* interoperability governmental service.
- **Client computers** – computers from which the authorized and anonymous users (depending on their rights and roles) will access the functionalities of the IS „EVF”.

To implement a number of functionalities, the IS „EVF” will consume a number of governmental services and *APIs* provided by governmental and external information systems, as follows:

1. **Authenticate** provided by *MPass* governmental service for authenticating users through electronic or mobile signature.
2. **Sign** provided by *MSign* governmental service for applying the electronic or mobile signature on documents and forms concluded within business processes of cases.
3. **Notify** provided by *MNotify* governmental service for implementing an universal and centralized system for notifying the users of the IS „EVF”.
4. **Log** provided by *MLog* governmental service to log sensitive business events produced after the operation of the IS „EVF”.

5. **Send open data** which interacts with *Open Data Portal* (<https://date.gov.md>) for the purpose of publishing the sets of public data produced in business processes of the *IS „EVF“*.
6. **Extract identity data** provided by the *PSR* to complete the human resources profile with official identification and documentation data.
7. **Extract criminal record data** provided by *RCFI* for extracting data regarding the previous criminal record of the person.
8. **Extract administrative offence data** provided by *AIS MAO* for extracting data regarding the previous administrative offences of the person.
9. **Extract integrity record data** provided by the *IS „PAPIR“* for extracting data related to person's integrity record.

3. Stakeholders involved and roles of the IS „EVF”

Business roles of the information system

In line with the legislation in force, the following entities of the Republic of Moldova are interested or should be involved in the development and good functioning of the IS „EVF”:

- **Ministry of Labour** – as the entity responsible for implementing and ensuring the good operation of the IS „EVF”. MOL is the direct beneficiary of the IS „EVF”, and the *Ministry of Labour* together with UNDP is the co-financer of the project which will take an active part at all the stages of design, development, production and operation of the information system.
- **National Anticorruption Center** – as the public authority responsible for evaluation of institution integrity, evaluation of public agents’ integrity and issuance of integrity records requested during the subsidy process.
- **Public Services Agency** – as provider of data related to identity, identity acts and biometric data related to the candidates/citizens to benefit from energy subsidy program stored in the *State Register of Population*.
- **Electronic Governance Agency** – as the body empowered with *e-Transformation* activities. *The Electronic Governance Agency* will ensure access to the interoperability governmental service *MConnect* and access to governmental service of *MCloud* (*MPass, MSign, MLog, MNotify*) and *Open Data Portal*. As well, the *Electronic Governance Agency* will provide the infrastructure for hosting the IS „EVF” within the common governmental technological governmental service *MCloud*.
- **Information Technology and Cyber Security Service** as an entity which manages the common governmental service *MCloud* hosting the IS „EVF”, as well as hosting the platform services with which the IS „EVF” will have to get integrated.

Owner of the information system

The owner of the IS „EVF” is the *Ministry of Labour*. As the owner of the IS „EVF”, the MOL will be able to attribute roles and rights to authorized persons, to operate the information system depending on their service duties. As well, the *Ministry of Labour* through the *IT Service of the MOL* will ensure the totality of support activities, maintenance and continuous development of the IS „EVF”.

Holder of the information system

The holder of the IS „EVF” is the *Information Technology and Cyber Security Service*, because it holds the common governmental technological governmental service *MCloud* which will host the information system. The *ITCSS* will be responsible, as well, for solving the totality of technical problems related to operation of the IS „EVF”.

Administrator of the information system

The administrator of the IS „EVF” is one or more persons appointed by the *Ministry of Labour* (as a rule, employees of the *ITS*). The whole administration of the content in the IS „EVF” will be carried out by specialists from the MOL. As well, at the level of the technical infrastructure of hosting the IS „EVF”, the administration functions will be exercised by the *ITCSS*.

Registrar of the information system

The registrars of the IS „EVF” shall be the MOL.

Purchaser of the information system

The purchaser of the information system *IS „EVF“* is the UNDP Digital Transformation Programme and the Ministry of Labour.

Users and their role in the information system

Candidate – human actor with the role of candidate. This category of users will have access to the *IS „EVF“* through the public interface that will provide the following functionalities:

- receiving notifications;

System Administrator – human actor, empowered with administration of system users, setting the information system, as well as starting/stopping /restarting the information system components. If the technological environment includes sufficient capabilities to fulfil the administration works, the implementation of such works in the system is optional. This category of actors has the following distinct roles:

- has access to functionalities of the users with the role of Authorized User;
- manages the profiles of users, and their roles;
- manages the system of nomenclatures and system metadata;
- sets the flows- and templates of documents/ statistical reports;
- sets the functional parameters of the *IS „EVF“*;
- manages the applications' server;
- manages the database in production;
- generates the reports related to the information system audit and the information content of the information system database;
- makes backup copies and recovery of functionalities of the *IS „EVF“* in case of disaster.

Information Systems of the MOL:

- **IS „EVF“** (*Information System „Energy Vulnerability Fund“*) – information system meant to computerize the necessary business processes (the goal of the given technical specifications).

Information systems of public authorities in the Republic of Moldova:

- **SRP** (*State Register of Population*) – information system managed by the *PSA*, the integration with which would allow taking over and entering automatically identity data, identity acts and biometric data stored in the SRP in the individuals' profiles (including photos, specimen of handwritten signature, etc.).

Information systems and MCloud governmental services:

- **MConnect** – represents governmental service of interoperability and data exchange. The *IS „EVF“* will use the given platform for data exchange with the information systems of other public authorities.
- **ODP** (*Open Data Portal* <https://date.gov.md>) – portal of open governmental data through which the *IS „EVF“* will publish KPI indicators, statistics and public reports produced within the necessary business processes.
- **MPass** – governmental service used for access control to information systems and ensuring authentication procedures through electronic or mobile signatures.

- **MSign** – governmental service used to apply and validate the electronic signature, including mobile signature.
- **MNotify** – governmental service used to notify the authorized users of the *IS „EVF”*.
- **MLog** – governmental service used for logging all critical business events related to the information systems of the PA in the Republic of Moldova.
- **MPower** – register of representation empowerments, supplying data regarding the held mandate of authorized users to perform specific actions in the *IS „EVF”*.

4. Functional model of the information system

Data model of the information system

Analyzing the modelled area, it is possible to delimit the totality of information items to be taken into account when developing the *IS „EVF“*.

To ensure good operation of the *IS „EVF“*, it is necessary to implement the functionalities necessary for managing the following groups of information items:

- profiles.
- A. ***Contest application form***. Represents an information item through which the data related to contest application forms are stored. These applications are concluded based on some specialized forms which cover the following categories of data:
 - a) Application identifier;
 - b) Date the application was sent;
 - c) Content of the application questionnaire;
 - d) Documents annexed to the application;
 - e) Testing/evaluating forms related to the application;
- B. ***Receipt***. Represents an information item through which the data related to the receipts delivered to contest participants - confirming receipt of the request to participate in the competition.
- C. ***Document attached to evaluation case file***. Represents an information item through which the data related to the electronic copies of the documents attached to the human resource evaluation case file are stored. The following categories of data are characterizing this information item:
 - a) Document identifier;
 - b) Document name;
 - c) Document type;
 - d) Evaluation case file;
 - e) Document loading date;
 - f) Document location route;
 - g) Document related file.
- D. ***evaluation form***. Represents an information item through which the data related to the electronic forms are evaluated. The following data categories are characterizing this information item:
 - a) Form identifier;
 - b) Evaluation type;
 - c) Evaluation modality;
 - d) Evaluated person data;
 - e) Evaluation case file;
 - f) Form category (according to the classifier of electronic forms set up in the *IS „EVF“*);
 - g) Evaluation questionnaire content data;

- h) Timetable envisaged for evaluation;
 - i) Evaluation start date, hour, minute;
 - j) Evaluation end date, hour, minute;
 - k) Form sending date, hour, minute;
 - l) Electronic signature (if it is the case).
- E. **Evaluation report form / endorsement.** Represents an information item through which the data related to the electronic forms of Evaluation Reports/Endorsements concluded. The following data categories are characterizing this information item:
- a) Form identifier;
 - b) Period planned for conclusion;
 - c) Form type;
 - d) Form category (according to the classifier of electronic forms set up in the IS „EVF“);
 - e) Form data;
 - f) Electronic evaluation form related to the Evaluation Report/Endorsement;
 - g) Form sending date, our, minute;
 - h) Electronic signature (if it is the case).
- F. **Approval/rejection form.** Represents an information item through which the approval/rejection events are registered. The following data categories characterize this information item:
- a) Event identifier;
 - b) Sending date, hour, minute;
 - c) Qualifier (approval/rejection; fit/not fit; promoted/not promoted, etc.);
 - d) Informative note;
 - e) Relevant electronic form draft;
 - f) Electronic signature.

Profile

Complex information item, which defines the totality of profile information which is necessary for operating the IS „EVF“. The profiles of the information system are defined by the following categories of information items:

- A. **Individual person's profile.** Represents registration data of any individual which is the object of an evaluation case (case authorized users). As a rule, the completeness level of an individual's profile depends on his/her role and contains the following categories of data:
- a) IDNP;
 - b) Name;
 - c) Surname;
 - d) Patronymic;
 - e) Sex;
 - f) Post address (domicile/residence);
 - g) Telephone contacts;

- h) Email contacts;
- i) Held identity acts' data;
- j) Family composition data;
- k) Biometrical data;
- l) Biographic data;
- m) Person's private data;
- n) Religious peculiarities' data;
- o) Education data;
- p) Employment data;
- q) Criminal record data;
- r) Administrative record data;
- s) Integrity record data.

B. Authorized person profile. Represents profiles of authorized users of the information system, who will be involved in the business processes of the *IS „EVF“* or will need access to evaluation case file details (represents case authorized persons). The following data should be able to be managed for the profile of the authorized person:

- a) Access credentials;
- b) Reference to individual person's profile (personal and contact data);
- c) Authentication strategy/restriction (user + password, electronic/mobile signature, PI access address, etc.);
- d) Access validity period;
- e) Held roles;
- f) Profile status.

Functionalities of the information system

CU01: Receive notifications

Use case through which the users of the *IS „EVF“*, regardless of their role, will receive the notifications sent by the *IS „EVF“* in relation to the business events in which they are involved.

CU02: Manage evaluation agenda

Use case which providing all the functionalities which are necessary for the setup of the evaluation agenda. The *IS „EVF“* will provide through CU02 facilities to set up the agenda for evaluation, taking as basis the primary data provided.

CU10: Search/view data

Use case provided by the *IS „EVF“* through which the authorized users will be able to explore the stock of data to which they have access based on the role held in the information system and service duties.

In this respect, the *IS „EVF“* will provide a mechanism for searching evaluation case files and their content, using different criteria, such as:

- person's identification data;
- data related to the users authorized for the case;

- data for identifying the evaluation case;
- calendar data related to the evaluation case files;
- calendar data related to the business events' forms of evaluation case files;
- data related to business events related to the evaluation case;
- person status;
- evaluation case status;
- etc.

SI „EVF“ will display as found results:

- persons;
- evaluation plans;
- evaluation case files;
- business events of evaluation cases;
- documents attached to evaluation cases.

For every result category, the *IS „EVF“* will allow performing the following manipulations:

- for found persons: viewing person's profile, viewing evaluation cases related to the person, viewing business events' documents which are related to the evaluation case;
- for evaluation cases' files: accessing the content of the evaluation case file, generation of case file;
- for business events of evaluation cases: viewing the document related to the event, accessing the electronic form of concluding a business event, approving/rejecting the form, generating the document related to the business event;
- for evaluation plans: viewing plan, approving/rejecting the plan, generating the document related to the plan.

It is appropriate for the *IS „EVF“* to provide a mechanism for indexed search of data and presentation of results depending on the relevance of the results of the formulated query.

CU11: Generate documents and reports

Functionality accessible for authorized users of the *IS „EVF“* which allows generating pre-established and ad-hoc reports regarding the information content of the information system and activity of authorized users.

These reports are useful for producing documents and reports specific for the REC activity, analysis of the information basis of the information system, performance of authorized users' activity, in particular, and of the entities they represent, in general, hence allowing extracting some performance indicators meant to analyze business processes.

It is appropriate for the information system to integrate a solution dedicated to setup and generation of reports (reports' generator), which would be reused, as well, for setting up and extracting the standardized documents specific for business processes of the *IS „EVF“*. The documents may be generated, as well, based on some configurable templates.

CU12: Approve/reject projects

Use case available to users with decision-making role in the *IS „EVF“* through which he/she will be able to approve or reject draft electronic forms and documents specific for business cases.

The approval or rejection of the electronic form implies the conclusion of an endorsement/comment, selection of approving/rejection options and applying electronic signature of the user with decision-making role.

CU13: Generate statistics and system reports

It is a use case providing functionalities which are necessary for users at the level of *System Administrator* to generate predefined and ad-hoc statistical reports regarding the events for operating the IS „EVF“.

These reports are useful for analyzing the carried out processes, information basis of the information system, performance of authorized users' activities, allowing to anticipate information security problems.

CU14: Manage users, roles, rights

Use case providing functionalities for managing users and their credentials (including specification of users' authentication strategy). As well, the IS „EVF“ will allow the authentication and authorization of users through the *MPass* governmental service.

The information system will provide functionalities, through which the roles and rights associated to them are managed, and which subsequently will be attributed to the authorized users of the IS „EVF“. The access rights to the user interface and database entries will be defined depending on the user-related role or explicitly for every separate user.

For specific roles, the access rights to human resources evaluation case files will be attributed explicitly through business events' forms or by users with administrator role.

CU15: Manage flows and document templates/ reports

Represents a use case meant for *System Administrator* that provides the totality of functionalities available for configuring work flows, and models of standardized documents/ statistical reports necessary for printing out entry or exit documents (setting the area letterhead, footnotes, static and dynamic content, formatting, graphic aspect, etc.) and of statistical reports

CU16: Manage metadata

Use case that provides to users with the role of *System Administrator* access to functionalities which are meant to manage metadata which are necessary to set up the functioning parameters of the IS „EVF“ (classifiers, nomenclatures, constants, parameters for setting and operating the information system). The developer will use on priority basis the official classifiers of the Republic of Moldova, when necessary.

CU17: Other administration activities

Represents a use case meant for the *System Administrator*, which describes the totality of functionalities meant to manage and audit the IS „EVF“: configuration of operating parameters of the IS „EVF“, configuration of parameters to integrate with the APIs exposed by third information systems, exploration of logged events, extraction of reports from system registers to analyze and identify eventual logical or physical security problems in the IS „EVF“ etc.

The use case for administration of the IS „EVF“ will implement the totality of functionalities to ensure the viability and integrity of the information system.

CU18: Execute automated procedures

Represents a use case through which the IS „EVF“ will execute automated procedures with a certain periodicity or upon occurrence of a business event. *System Administrators* will have facilities to set up parameters for initiating and operating automated procedures.

The following can be mentioned under these procedures:

- generation of backup copies;

- data archiving;
- initiation of evaluation cases;
- erasing forms which exceeded the deadline of being under the status „Draft“;
- calculation of complex KPI necessary for generating complex statistical reports;
- other categories of automated procedures.

CU20: Log events

Use case through which the logging of business events generated by the functional components of the *IS „EVF“* will be performed. Any event generated within the business processes implemented in the *IS „EVF“* will be logged and saved in the corresponding tables of the Database.

The logging mechanism will be developed based on standards and good practices implemented in the industry. The information system will provide functionalities to set up the strategy to log business events, including: business events' categories subject to logging, calendar period (determined or undetermined) for logging) etc.

For critical or sensitive business events, the logging will be carried out in parallel using the governmental service *MLog* (example: import of data from the *SRP*, accessing data in the profile of Candidate/ receiving the candidate's file, etc.).

CU21: Send notifications

Use case which provides functionalities for notifying the authorized users of the *IS „EVF“*. Notifications will be stored in the Dashboard of authorized users, ensuring direct access to the electronic form, whose business event has generated the notification.

The *IS „EVF“* will generate and send automatically the notifications related to any business event generated by the evaluation case of the Candidate. As well, the *IS „EVF“* will generate and send automatically to users notifications about any business event which needs their involvement.

The systems will provide both, mechanisms of internal notification (integrated in the *IS „EVF“*), and integration of mechanisms for external notifications through the governmental service *MNotify*, as needed.

CU22: Data exchange between computer systems

Use case which provides the necessary functionalities *IS „EVF“* for the exchange of data with external computer systems.

This synchronization refers to the exposure or consumption of interfaces designed for the reciprocal exchange of data (reception of data from external sources, sending of data to external computer systems and bidirectional exchange of data).

Part of the integrations with external IT systems are to be implemented through the *MConnect* interoperability governmental service. Governmental services (*MPass*, *MSign*, *MLog*, *MNotify*, *MPower*, *PDD*) are to be integrated directly through the APIs exposed by them.

The integration of *IS „EVF“* with the internal IT systems of the MOL is to be carried out largely through a microservices infrastructure.

User interface of the information system

The *SI „EVF“* should provide an ergonomic and intuitive user interface, accessible to all types of users. The user interface of the information system will be accessed through an Internet browser. The *IS „EVF“* should have an intuitive, acceptable, balanced, distinct and optimized graphic design for the minimum work resolution 1360x468 for PC type computers. As well, the user interface should be responsive to resolutions for such devices as smartphones and tablets, and optimized for tactile screens.

For users' easiness, the information solution will have a system of online contextual assistance, at the level of every user interface.

Depending on the users' categories (their rights and roles), the information system will provide a personalized interface for every user category.

The SI „EVF“ will provide a user interface in Romanian language. The procedures for finding information and entries will be carried out through a simple search (specifying search ranges) or some higher complexity searches, through which a more accurate filtering of information may be carried out (QBE forms). Regardless of the nature of searched for information, the user will use the same method of interrogation and finding information for any compartment of the information product.

Additionally to the search module based on QBE principle, which will give the possibility to define visually sophisticated interrogations, the interface should provide the possibility to deepen the search results by ensuring the possibility of filtering the data in the list with search results.

The user interface of the information system should ensure the filtering of entries which meet the search criteria presented to users depending on their access rights.

There should be a possibility to filter indexed measures (classifier values, nomenclatures), by choosing the value from predefined lists. For numerical or calendar date type fields, there should be a possibility to filter by exact value of the searcher for characteristic or by search mask.

The content of any table with results or electronic form, depending in the nature of the contained information, there should be a possibility to export them in the following formats CSV, XLS/XSLX and PDF. The data export should be strictly delimited by roles. All the data export actions will be logged.

Reporting, audit and statistical system of the information system

The IS „EVF“ will have functionalities meant for audit/logging widely used in industry. It should be setup to log technical and business events. The information system will provide a mechanism to generate predefined and ad-hoc reports able to ensure an analysis or evaluation pertinent to the processes.

5. Functional requirements of the information system

Agreements on formulation of functional requirements

The requirements set in this document are marked using the following conventions:

- all the requirements are indexed with 3 values **C.X.Y**, where **C** represents the category of the requirement (CF – functional requirement) **X** represents the use case for which the functional requirement is formulated, and **Y** is the single identifier of the requirement in the use case of which it is a part.
- the binding nature is mentioned for every functional requirement: M – mandatory requirement, D – desirable to be implemented, optional requirement.

The offer provided by the *Provider* should meet all the requirements indicated as mandatory.

The offer provided by the *Provider* will obtain competitive advantage for each optional requirement assumed to be implemented.

The informative requirements are mean to provide more support information, to understand better the context of other requirements.

CU01: Receive notifications

The functional requirements of the mechanism meant to receive notification sent by the IS „EVF” to authorized users.

Functional requirements for use case CU01

| Identifier | Binding nature | Description of functional requirements |
|------------|----------------|---|
| CF 02..01. | M | IS „EVF” will notify automatically any authorized user in case of registering a business event which implies any actions from the user or which modifies the status of processes which are managed, monitored by him/her or refer to him/her. |
| CF 02.02. | M | Authorized users will receive notifications at the email address indicated in their profile in the IS „EVF”. |
| CF 02.03. | M | A copy of the notification will be displayed in the Dashboard of the authorized user in the IS „EVF” (if applicable). |
| CF 02.04. | M | The authorized user IS „EVF” will have the functionality to set up preferences for receiving notifications (on email or in Dashboard). |
| CF 02.05. | M | IS „EVF” will send the entire range of notifications meant for authorized users. |
| CF 02.06. | M | A notification sent through Email may contain an attached file (<i>example: receipt.</i>). |
| CF 02.07. | M | Users of the IS „EVF” will receive notifications through Email in HTML format or enriched Text Format. |

Use Dashboard

The functional requirements meant for the operation of the Dashboard meant for authorized users of the IS „EVF“

| Identifier | Binding nature | Description of functional requirement |
|-------------------|-----------------------|--|
| CF 09.01. | M | IS „EVF“ will provide the authorized users a Dashboard through which they will be notified about important business events and will provide rapid access to their details. |
| CF 09.02. | M | The following business events displayed on the Dashboard may be listed: <ul style="list-style-type: none"> • system notifications; • notifications regarding the need to involve the user in the activities of the work flows of the IS „EVF“ (including delay alerts); • notification regarding the forms or documents waiting to be approved by decision-making roles (including delay alerts); • notification about filling in the evaluation case file with new documents or electronic forms; • notifications on acceptance/rejection of electronic forms' drafts; • other relevant events. |
| CF 09.03. | M | The dashboard of the US „EVF“ user will display only business events relevant for the roles and data available for the authorized user. |
| CF 09.04. | M | The dashboard of the user with the role of System Administrator will display all business events related to the functionalities of the IS „EVF“ (totality of notifications displayed in the Dashboard of all the users of the IS „EVF“ and notifications dedicated exclusively to the user with role of System Administrator). |
| CF 09.05. | M | The dashboard will group business events displaying them in the form of indicators with aggregated values (<i>example: Unread system notifications – 20; Open evaluation cases – 20, Forms under work – 10; Forms sent for approval – 2; etc.</i>) which will content hypertext reference to access details. |
| CF 09.06. | M | IS „EVF“ will display detailed entries of the Dashboard in specialized windows or fields on the main page of the user's interface, which will have hypertext reference for accessing details (<i>example: opening the form which has generated the notification</i>). |
| CF 09.07. | M | When accessing the hypertext reference related to the aggregated value or detailed entry of the Dashboard, the IS „EVF“ will ensure access to detail information related to it or requested functionality (<i>example: content of the psychological evaluation test, direct approval/rejection of the forms sent for review and approval, etc.</i>). |
| CF 09.08. | M | The dashboard of the IS „EVF“ will have a specialized field (favorite) where the user will place references to the content information on which he/she works. They can be of 3 types: |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| | | <ul style="list-style-type: none"> open/closed evaluation cases; performed electronic forms (business events related to currently performed evaluation cases); reviewed electronic forms (agenda or business events related to reviewed evaluation cases). |
| CF 09.09. | D | IS „EVF“ will provide to every user the functionality of individual setup of the Dashboard aspect and content. |

5.11. CU10: Search/view data

The functional requirements related to the mechanism of searching for data stored in the database of the IS „EVF“

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 10.01. | M | IS „EVF“ will provide a mechanism to search for data and documents in the stored data content. |
| CF 10.02. | M | IS „EVF“ will provide a mechanism for indexed search of data. The search mechanism will use morphological means. |
| CF 10.03. | M | IS „EVF“ will allow defining the following search targets (the search result will display the list of): <ul style="list-style-type: none"> evaluation case files; documents contained in the evaluation case files; concluded electronic forms concluded and contained in the evaluation case files. |
| CF 10.04. | M | IS „EVF“ will provide a flexible and efficient mechanism to define search criteria. |
| CF 10.05. | M | In case of formulating too wide search criteria, or criteria which need too much time and resources for execution, the IS „EVF“ will not execute these queries, but will request the user to narrow the area of searched for values. |
| CF 10.06. | M | The search results will be ordered depending on the relevance of the search query result, alphabetically or creation date/last update. |
| CF 10.07. | M | The user will be able to define criteria for ordering or grouping the content of the list with search results. |
| CF 10.08. | M | IS „EVF“ will provide a mechanism for paging the search results meant to avoid the overloading of web explorer and data transportation channels. |
| CF 10.09. | D | The search results' entries will be marked (specific color or icon) depending on the nature or status of found informational item. |
| CF 10.10. | M | IS „EVF“ will provide the functionality of refining the search in found results. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 10.11. | M | IS „EVF“ will allow initiating some processes regarding the found results or a group of found and marked results, such as: <ul style="list-style-type: none"> • selecting the entries of search results; • initiating the creation of business event form including the results in the form or in the base of selected entries (<i>example: including a group of human resources' profiled in an evaluation plan</i>); • changing the entry's status; • multiple deletion; • multiple electronic signing; • other relevant actions. |
| CF 10.13. | M | IS „EVF“ will restrict the access to found results' details when the use who has initiated the search process does not have access to the information items requested to be accessed. |
| CF 10.14. | M | IS „EVF“ will allow exporting the table with the search results in CSV or PDF formats. |

5.12 CU11: Generate documents and reports

The functional requirements of the mechanism to extract documents and reports to be presented in a user-convenient form or for assisting the work flows and the decision-making process.

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 11.01. | M | IS „EVF“ should be able to provide a number of statistical and ad-hoc reports, for the decision-makers. |
| CF 11.02. | D | It is appropriate for the basis to generate reports to be a dedicated platform meant to set up dynamic generation of reports (<i>example: JasperReport</i>). |
| CF 11.03. | M | IS „EVF“ should provide to MOL decision-makers a predefined number of documents/reports which may be configurable and upon request, so as to ensure the production of ad-hoc reports, if needed. |
| CF 11.04. | M | IS „EVF“ will provide a set of documents to be generated based on data stored in the database of the information system, as follows: <ul style="list-style-type: none"> • application for participation in the contest; • evaluation report; • own responsibility declaration; • criminal record; • integrity record; |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| | | <ul style="list-style-type: none"> • system notification; • other relevant documents. |
| CF 11.05. | M | IS „EVF” will have predefined (editable) templates for every type of generated document necessary for the eventual update of generation rules. |
| CF 11.06. | D | IS „EVF” will allow drafting documents in electronic format, applying the digital signature of REC or MOL. |
| CF 11.07. | M | Developer will implement up to 25 documents to be generated by the IS „EVF”. The complete list of documents will be identified during business analysis. |
| CF 11.08. | M | <p>IS „EVF” will provide a set of reports to be generated based on the data stored in the database of the information system, as follows:</p> <ul style="list-style-type: none"> • Performance report of the IS „EVF” (statistical data regarding the current content of IS „EVF”) with different principles of aggregation (according to the MOL subdivision, etc.); • The performance report of the authorized user, containing statistical data and details regarding newly-opened evaluation cases, under operation cases and closed cases for a determined period of time with a different level of aggregation; • Form of evaluation case file (a synthesis of data from all business events’ forms of the evaluation case file); • Report on evaluation cases (according to subdivisions, according to time periods, according to type of evaluation, according to evaluation result); • Evaluation tally sheet; • Evaluation report/endorsement; • Extract from the Evaluation Register; • Other relevant reports. |
| CF 11.09. | M | IS „EVF” will have a mechanism for defining the set of reports and data available for every category of users, depending on their roles and rights. |
| CF 11.10. | M | A user viewing a report in the system, should be able to export it to an external editable file (XLS/XLSX și DOCX). |
| CF 11.11. | M | Implicitly, the reports will be extracted in PDF format. |
| CF 11.12. | M | The developer should implement up to 25 categories of predefined reports requested by the beneficiary, including the ones specified in CF 11.08. |
| CF 11.13. | M | IS „EVF” will log all the events for generating and printing out reports and documents. |

5.13.CU12: Approve/reject projects

The functional requirements of the component meant for REC decision-making roles to approve or reject the electronic forms concluded through the IS „EVF“.

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 12.01. | M | IS „EVF“ will provide the authorized stakeholders (REC decision-makers) a mechanism to approve or reject the drafts concluded by REC Specialists which need approval before being saved or processed. |
| CF 12.02. | M | Preventively, the following draft documents (electronic forms concluded by REC Specialists) shall be approved by decision-making roles in IS „EVF“: <ul style="list-style-type: none"> • new/modified test to be launched in production; • test to be extracted from production. |
| CF 12.03. | M | The complete list of electronic forms needing approvals from the decision-making roles will be identified in the business analysis process. |
| CF 12.04. | M | Approval or rejection implies providing a grade, selecting a status (approved or rejected), its conformation and applying the electronic signature by the user with decision-making role. |
| CF 12.05. | M | Access to the functionality for approving/rejecting the draft will be possible if the user with REC decision-making role also has empowerment (verification is done through MPower). |
| CF 12.06. | M | IS „EVF“ will use the MSign governmental service for applying the electronic signature for approving/rejecting the electronic form. |
| CF 12.07. | M | If the electronic form is approved, the IS „EVF“ will notify all relevant users regarding the approval/rejection event. |
| CF 12.08. | M | If the electronic form is rejected, the work flow will switch automatically to the previous stage (will return to concluding the form of the user who has sent it for approval) and will notify all the relevant users. |
| CF 12.09. | M | When a form is sent for approval, it can be modified only by the decision-maker who has to approve it, by repeated application of the electronic signature. |
| CF 12.10. | M | IS „zEVF“ will log all the events for approving/rejecting the draft electronic forms. |

5.14. CU13: Generate statistics and system reports

The functional requirements for the component of extracting reports for the purpose of IT audit of the IS „EVF“.

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 13.01. | M | <i>IS „EVF“</i> should provide a number of management, statistical, and ad-hoc reports for the administrative roles to have the possibility to monitor the activity and the status of the system. |
| CF 13.02. | I | The reports managed are meant for IT audit functions and do not include reports related to business event related to human resources' evaluation cases. |
| CF 13.03. | M | This reporting is necessary within the entire system, including: <ul style="list-style-type: none"> • nomenclatures and classifiers; • database entries; • user's activity; • access and security permissions. |
| CF 13.04. | M | Reports will be generated based on the following categories of logged events: <ul style="list-style-type: none"> • successful login of users; • unsuccessful login of users; • sent notifications; • actions on data (accessing, adding, modifying, eliminating). |
| CF 13.05. | M | <i>IS „EVF“</i> will allow extracting reports in an aggregate way or detailing them per specific user, central or territorial subdivision of MOL or some groups of users. |
| CF 13.06. | M | A user who views a report within the system, should be able to export it in PDF format or external editable file (XLS/XLSX, CSV, DOC/DOCX). |
| CF 13.07. | M | The developer will implement up to 10 predefined reports got IT audit, requested by MOL. The audit reports that may be generated through system means will not be implemented in the user interface of the <i>IS „EVFR“</i> . |
| CF 13.08. | D | To extract reports and statistics from the system, which are relevant for UC16, it is welcome to use platform dedicated to setting up and generating reports. |

5.15. CU14: Manage users, roles, rights

The functional requirements of the component related to managing users and setting up access to user interface and database content of the *IS „EVF“*.

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 14.01. | M | <i>IS „EVF“</i> will have a mechanism to define and manage dynamically the users, their roles and rights. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 14.02. | M | IS „EVF“ will include a default category of users created by the developer and the credentials will be provided upon delivery for the category of super-administrator . |
| CF 14.03. | M | IS „EVF“ will allow blocking/unblocking the user's access. |
| CF 14.04. | M | IS „EVF“ will provide its own solution for login through the mechanism of user_name+password, LDAP, authentication in 2 levels (2FA) and will use alternatively the MPass governmental service for authentication of users through electronic or mobile signature. |
| CF 14.05. | M | IS „EVF“ will allow specifying the modality for user to get connected to the system (electronic/mobile signature, user name + password, IP address or a combination of these). |
| CF 14.06. | M | <p>The following categories of data will be able to be managed within users' profiles:</p> <ul style="list-style-type: none"> • user name; • user surname; • email of contact; • telephone of contact; • access login; • access password; • authentication strategy (user + password, electronic signature /mobile signature, authentication in 2 levels (2FA), LDAP etc.); • activated/inactivated account; • access validity period; • users' roles; • users whom I temporarily replace; • users who temporarily replace me; • other relevant data. |
| CF 14.07. | M | IS „EVF“ will provide a mechanism to define the users' rights to access data depending in the categories or types of concluded electronic forms and cases in which the authorized user is involved. |
| CF 14.08. | M | A profile of authorized user may be deleted physically from the IS „EVF“ only if there are no logged events or entries related to it. |
| CF 14.09. | M | The mechanism of managing users' rights and roles will allow formulating the principles of access to the components of the user interface and the information content of the information system for every user, separately, or group of users. |
| CF 14.10. | M | IS „EVF“ will provide user interface and information content only based on the rights and roles held by users. |
| CF 14.11. | M | The information system will allow setting up an unlimited number of roles. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 14.12. | M | One role is defined through generic name, brief description and active/inactive status. Inactivated roles will not be displayed when setting up the access rights to the application resource or users' rights. |
| CF 14.13. | M | After being introduced and activated, the role will be available to be used in the modules for users' management (attributing users' roles) and components' management in IS „EVF“ (attributing roles that have access to components of user's interface and setting up their access modalities). |
| CF 14.14. | M | It will not be possible to delete a role, if it is attributed at least to one user or to one component of the user interface of IS „EVF“. |
| CF 14.15. | M | IS „EVF“ will provide a mechanism for registering the components of user interface (resources) for the purpose of ensuring a mechanism to define users' access rights to user interface. A component means any modular entity of the application (form, menu, menu option, field, etc.), whose detail level is enough to set up the access rights, transition of workflows or actions accessible to users. |
| CF 14.16. | M | IS „EVF“ will allow setting up the hierarchy of user interface components, having at the root level the basic modules of the application, and the subordinated levels will not be limited in depth, with the hierarchy determined by their architecture. |
| CF 14.17. | M | Any component of the user interface in IS „EVF“ will contain data regarding the generic name, brief description, actions available to users (business events they can generate), roles that have access to the user interface or actions that may be undertaken. |
| CF 14.18. | M | Any component of the user interface in IS „EVF“ will contain data regarding the status through which the data pass when managed through the component, transitions for going through the component status (setting up workflows). |
| CF 14.19. | M | IS „EVF“ will allow defining permissions related to actions a (business events) available to users with access to user interface components. The following categories of actions available to users will be set up: <ul style="list-style-type: none"> • viewing the entry; • adding an entry; • changing an entry; • deleting an entry; • workflow transition; • other relevant actions. |
| CF 14.20. | M | IS „EVF“ will allow setting up the log strategy for business events generated by each component of user interface. |

5.16. CU15: Configure flows and document templates /reports

The functional requirements of the component for setting up workflows, electronic forms meant to insert data and templates of documents, which will be populated with data and generated in the IS „EVF“.

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 15.01. | M | IS „EVF“ will have a mechanism to manage program resources (modules, electronic forms, menu options, buttons, etc.) to set up workflows and define processing rules for all scenarios related to processes of concluding and processing electronic forms related to human resources' evaluation cases. |
| CF 15.02. | M | It should be possible to manage the workflows using the graphic interface of the information system in which the user works in a usual way. |
| CF 15.03. | M | The workflows will be defined by specifying the statuses through which an electronic file can pass through and the processing steps (development stages or transitions of the workflow which may be carried out in a specific status of the form) carried out by users with specific roles. |
| CF 15.04. | M | A workflow will be implemented as a collection of activities through which would pass an electronic form concluded within business processes which are carried out sequentially. |
| CF 15.05. | M | The number of steps that may be include in a flow should not be limited. In this way, the computing solution will be adjustable to the changes in the working methodology with the documents processed within the human resource evaluation case file's procedures. |
| CF 15.06. | M | A workflow should be able to have an associated coordinator (supervisor). The coordinator should be able to receive warning messages (notifications) generated by the respecting flow rolling. The user who launches a processing form for a workflow should be able to specify who the flow supervisor is. |
| CF 15.07. | M | The developer will set up the processing flows of the electronic forms meant for concluding all the business events related to' evaluation cases. |
| CF 15.08. | M | IS „EVF“ will provide mechanisms for configuring the document templates (and reports) related to the generated documents, based on the completed electronic forms (the templates will have a well-defined structure that will allow changing the appearance and content of the extracted document). |
| CF 15.09. | M | Document templates are welcome to be configured through a reporting and configuration platform (Example: JasperReports). |
| CF 15.10. | D | All the templates of documents set up through CF 15.09 - CF 15.10 will be used when generating documents through CU11. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 15.11. | M | Upon the request of the Beneficiary, the developer will set up to 20 templates of documents to be generated by the IS „EVF“. |

5.17. CU16: Manage metadata

The functional requirements necessary for managing the metadata of the IS „EVF“ are included in table 5.16.

Table 5.16. Functional requirements for use case CU16

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 16.01. | M | IS „EVF“ will have a mechanism for managing the nomenclatures, classifiers which contain the totality of metadata meant for setting up the system and managing the processes events. |
| CF 16.05. | M | IS „EVF“ will not allow eliminating a category of metadata, if it is used at least in one entry of the database. |
| CF 16.06. | M | IS „EVF“ will provide a mechanism for having versions for the metadata values and establishing the time interval related to validity of metadata values. |
| CF 16.07. | M | The developer will ensure the update of the classifiers in automated regime, if such facilities are provided by the information systems with which the IS „EVF“ is getting integrated (<i>example: State Register of Population</i>). |
| CF 16.08. | M | IS „EVF“ will allow setting up linear and hierarchical classifiers (in which some values may have parent categories). |
| CF 16.09. | M | IS „EVF“ will provide a mechanism to export and import classifiers from the user interface in XML or CSV format. The import and export rights will be attributed to users with the role of System Administrator. |
| CF 16.10. | M | IS „EVF“ will provide a mechanism from the user interface with the role of System Administrator to set up variables of general configuration of the system |

5.18. CU17: Other administration activities

The functional requirements regarding other categories of activities to manage the IS „EVF“ are provided in table 5.17.

Table 5.17. Functional requirements for case use CU17

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 17.01. | M | IS „EVF“ should allow administrative roles to take over, display and reconfigure the operational parameters and the general system settings. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 17.02. | M | IS „EVF“ will allow the users with System Administrator role to set up access to APIs provided by external information systems with which IS „EVF“ interacts. |
| CF 17.03. | M | System Administrator will have a specialized interface to access and analyze systems logs of the IS „EVF“. |
| CF 17.04. | M | IS „EVF“ will provide an interface meant to monitor the current functioning of the information system and analyze the loading level or identify the possible operational problems. |
| CF 17.05. | M | System Administrator will be able to generate, upon request, backup copies of the IS „EVF“ and to establish the functionality of the information system based on the backup copies generated manually or automatically. |
| CF 17.06. | M | IS „EVF“ will provide the functionality of archiving and excluding historical data to be deleted according to the legislation in force. |
| CF 17.07. | M | IS „EVF“ will provide the System Administrator with all functional facilities necessary to ensure the functionality of the information solution in good conditions. |

5.19. CU18: Execute automated procedures

The functional requirements of the mechanism for executing the automated tasks necessary for operation of the IS „EVF“ are described in table 5.18.

Table 5.18. Functional requirements for the use case CU18

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 18.01. | M | IS „EVF“ will have a component of executing automated procedures (jobs) launched with a certain periodicity and at a certain point in time. |
| CF 18.02. | D | IS „EVF“ will have the functionality of setting up the automated procedures (performed action, periodicity and the moment of launching the automated procedure etc.). |
| CF 18.03. | M | IS „EVF“ will provide the mechanism for automated generation of backup copies (according to some pre-established rules) based on which it will be possible to re-establish the functionality of the information system if any security incidents occur. |
| CF 18.04. | M | IS „EVF“ will provide the mechanism for archiving old data, which are useless for current business processes of the REC and removing them from the production platform. |
| CF 18.07. | M | IS „EVF“ will automatically trigger, if necessary, the procedures of mutual data exchange with external information systems defined through CU22. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 18.08. | M | IS „EVF“ will delete automatically the electronic forms in „Draft“ status, which have exceeded the deadline of being in this status set up through CU15. |
| CF 18.09. | M | IS „EVF“ will be able to perform periodically and in a planned manner (in hours of minimum demand for the IS „EVF“) the preliminary calculation of the indicators which are necessary to generate in useful time complex statistical reports. |
| CF 18.10. | M | IS „EVF“ will publish periodically within the Data Portal public reports and KPI produced during the implemented business processes. |

5.21. CU20: Log events

The functional requirements of logging the business events produced during the operation of the IS „EVF“ are provided in table 5.20.

Table 5.1. Functional requirements of the use case CU20

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 20.01. | M | IS „EVF“ will contain a mechanism to log all the business events related to its use. |
| CF 20.02. | M | <i>System Administrator</i> will be able to set the totality of log strategies related to the business events through the use case <i>CU14</i> . |
| CF 20.03. | M | <i>SI „EVF“</i> will provide to System Administrators a mechanism to search, filter and view the details of logged events |
| CF 20.04. | M | The following categories of events will be logged: <ul style="list-style-type: none"> • user login; • user logout; • adding/changing/removing/accessing the entry; • business events specific to workflows of the IS „EVF“; • synchronization with external information systems; • generating/accessing report; • queries to database; • other specific business events. |
| CF 20.05. | M | The logged events will save the following categories of data (depending on the nature of logged events): <ul style="list-style-type: none"> • identifier of the user who has generated the event; • category of the logged event; • moment of logging the event; • module of IS „EVF“ which has generated the business event; • entry related to the business event; • action performed by the user. |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|--|
| CF 25.06. | M | IS „EVF“ will log exhaustively all the produced business events. |
| CF 25.07. | M | IS „EVF“ will log in parallel the critical business events through the logging governmental service MLog. |
| CF 25.08. | M | IS „EVF“ will provide the functionality of defining the critical business events to be logged in parallel through the MLog government service. |

5.22. CU21: Send notifications

The functional requirements of the component related to notifying the stakeholders of the IS „EVF“ are provided in table 5.21.

Table 5.2. Functional requirements for the use case CU21

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 21.01. | M | Depending on the user (the data for setting its profile), the functionality for notifying the users will apply one of the 3 notification strategies: <ul style="list-style-type: none"> • notification via Email; • notification via Dashboard of the authorized user; • both categories from above. |
| CF 21.02. | M | Depending on the configurations of the resources in the IS „EVF“, the functional component for notification will send notifications to the relevant users upon occurrence of a business event specific for the program resource. |
| CF 21.03. | M | Notification will contain reference of accessing the resource/form relevant to the business event which has generated the notification (valid for notifications stored in the user's Dashboard). |
| CF 21.04. | M | Authorized users (regardless of the roles that they have) will be able to set up the preferences of the notification means. |
| CF 21.06. | M | <i>The System Administrator</i> will have the functionality of concluding and sending notifications to explicit users or groups of users. |
| CF 21.08. | M | IS „EVF“ will notify the System Administrator about any problems related to the performance and availability of the information system. |
| CF 21.09. | M | IS „EVF“ will notify the external users through the governmental system of notification MNotify. |

5.23. CU22: Exchange data with information systems

The functional requirements of the procedures for synchronizing the data processed by the IS „EVF“ with the databases of external information systems are provided in table 5.22.

Table 5.3. Functional requirements for use case CU22

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| CF 22.01. | M | IS „EVF” will interact with external information systems to receive/supply data through APIs exposed by them (in case of nongovernmental information systems) and the interoperability governmental service MConnect (in case of information systems of PA). |
| CF 22.02. | M | The interactions among MOL internal information systems in case when the data supply/reception services are not requested by the information systems of other PA from the Republic of Moldova will be implemented through micro-services. |
| CF 22.03. | M | IS „EVF” will have a mechanism meant for mutual exchange of data between the public interface and the BackEnd component so as to provide electronic services through the public interface of IS „EVF” and to send to the public interface/announcements and public reports. |
| CF 22.04. | M | IS „EVF” will get integrated with the RCFI so as to extract criminal record of the Candidate |
| CF 22.07. | M | IS „EVF” will get integrated through the interoperability governmental service MConnect with the State Register of Population to receive specific metadata, data about persons’ identity, held identity documents, specific biometrical data, photos and specimen of handwritten signature in the process of managing the profiles of Candidates. |
| CF 22.08. | M | IS „EVF” will get integrated through the interoperability governmental service MConnect with the IS „PAPIR” to send request for getting integrity records and to receive the integrity records of the Candidates. |
| CF 22.09. | M | IS „EVF” will get integrated with the governmental service MPass for the purpose of implementing the user authentication procedures through the electronic signature and mobile signature. |
| CF 22.10. | M | IS „EVF” will get integrated with the governmental service MSign to implement the procedure of electronic signature of electronic forms/documents. |
| CF 22.11. | M | IS „EVF” will get integrated with the governmental service MLog to log critical business events. |
| CF 23.12. | M | IS „EVF” will get integrated with the governmental service MNotify to implement the mechanism of users’ notification. |
| CF 22.13. | M | IS „EVF” will get integrated with the governmental service MPower to verify the empowerments of authorized users. |
| CF 22.14. | M | IS „EVF” will get integrated with the Open Data Portal to publish public statistical data produced in the implemented workflows. |
| CF 22.15. | M | All synchronization events and in particular access to personal data through the procedures described by the functional requirements CF |

| Identifier | Binding nature | Description of functional requirement |
|------------|----------------|---|
| | | 23.03 - CF 23.14 will be logged through the internal logging mechanism of IS „EVF” and the MLog governmental service. |

6. Nonfunctional requirements of the information system

This compartment of the Terms of Reference sets forth the requirements regarding the nonfunctional characteristics that should be held by the IS „EVF”. The computing solution which is the object of the respective procurement should meet the set nonfunctional requirements mentioned below.

Conventions on formulation of nonfunctional requirements

The nonfunctional requirements set forth in this document are marked using the following conventions:

- all requirements are indexed with two values **X.Y**, where **X** represents the category of requirements described in table 6.1 and **Y** is the single identifier of the requirement in the category of which it is a part.
- there is a binding level for every requirement: **M** – mandatory requirement to be implemented, **D** – desirable requirement to be implemented, optional, and **I** – requirement of informational nature.

Table 6.1. Categories of requirements in technical specifications

| | Meaning | Interpretation |
|------|--|--|
| DEL | Deliverable requirement | Requirement refers to deliverables to be submitted by the developer of the IS „EVF”. |
| DOC | Document requirement | Requirement refers to the IS „EVF” related documentation to be delivered by the Provider. |
| GEN | General requirement | General requirements of IS „EVF” implementation. |
| GMS | Guarantee, maintenance and post-implementation support requirement | Requirement refers to characteristics of the services for operational maintenance and post-implementation development of the IS „EVF”, requested within the procurement. |
| INT | Interoperability requirement | Requirement refers to the interoperability framework of the IS „EVF”. |
| LIPR | Licensing and intellectual property requirements | Requirements refer to intellectual property rights related to the IS „EVF” and soft components necessary for the operation of the SI „EVF”. |
| PERF | Performance requirement | Requirement refers to operation performance of the IS „EVF”. |
| SEC | Security requirement | Requirement refers to aspects of ensuring information security to be met by the IS „EVF”. |

| | Meaning | Interpretation |
|-----|-------------------------|---|
| SHC | Platform requirement | Requirements for the software platform, hardware and communication channels necessary for the operation of the IS „EVF”. |
| SR | Scalability requirement | Requirement refers to the scalability properties of the IS „EVF” to increase the number of users, transactions or volume of processed data. |

The proposal submitted by the *Provider* should meet on binding basis all the requirements indicated as mandatory.

The bidders' proposals will obtain competitive advantage for every optional requirement assumed by the *Provider*.

The informative requirements are meant to provide more information, for a better understanding of the context of other requirements.

General requirements of the computer system

The general system requirements are defined by the policies and strategies developed and adopted in the Republic of Moldova. It is important to mention that these acts are based on good industry practices and include many organizational measures but also a series of technical measures. The general system requirements specific to IS „EVF” are set out in Table 6.2.

Table 6.2. Categories of specification requirements

| ID | Binding nature | Requirement |
|---------|----------------|---|
| GEN 001 | M | IS „EVF” must be developed based on the Agile methodology. |
| GEN 002 | M | All user interfaces and the content of the database will be configured in Romanian language, with the use of Romanian diacritics. |
| GEN 003 | D | The information system must be able to configure the Russian version of the user interface. |
| GEN 004 | M | IS „EVF” database data is to be stored in unicode format (example: using UTF-8). |
| GEN 005 | M | User interface elements must comply with Level A with the requirements of Web Content Accessibility Guidelines (WCAG) 2.0. |
| GEN 006 | M | The user interface for authorized users of IS „EVF” will be optimized to 1360x768 resolution by avoiding the appearance of scroll bars for user interfaces presented by the IT solution. |
| GEN 007 | M | IS „EVF” will provide adaptive user interface (will deliver responsive interface) depending on the device used by it (notebook, netbook, desktop computer, smartphone, tablet, etc.) optimized for touch screens. |
| GEN 008 | M | Data search procedures will be implemented through simple searches (specifying search strings) or more complex searches, through which more accurate filtering of information can be performed (QBE forms). Regardless of the nature of the information sought, the user will use the |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| | | same method of querying and retrieving data for any compartment of the user interface of the IT product. |
| GEN 009 | M | The user interface of the computer system must ensure the search, filtering and viewing of records that correspond to the search criteria presented to users according to their access rights. |
| GEN 010 | M | The contents of any search results table must be able to be exported in either XLS, CSV and PDF format. |
| GEN 011 | M | The IS „EVF” architecture will be designed in an integrated way, developed with the application of the best practices in the field (example: architectural principles and reference architectures aligned TOGAF 9.1). |
| GEN 012 | M | The IS „EVF” architecture must have a high level of resistance to falls, not contain single points of fall (SPOF). |
| GEN 013 | M | The IS „EVF” architecture must ensure the rational and balanced use of processing resources. |
| GEN 014 | M | The IS „EVF” will be developed based on a multilevel SOA architecture (at least 3 architectural levels (example: presentation level, business logic level and data level)). |
| GEN 015 | M | The IS „EVF” must provide web interfaces for interaction with computer systems of the MOL and other public authorities of the Republic of Moldova through microservices and MCloud. |
| GEN 016 | M | The IS „EVF” will be optimized in the minimum data transfer between the client and server computer, focusing on avoiding unnecessary requests as much as possible, implementing AJAX with JSON, minimizing the server resources required for authentication, authorization and logging procedures. |
| GEN 017 | M | The potentially variable information (example: different parameters, data storage paths, connection paths with external services, classifiers, etc.) will be configurable and will NOT require the recompilation of the solution or direct interventions in the database. |

Performance requirements

IS „EVF” should have the capacity to process in useful time the transactions performed by the users of the information system, according to the volumetric analysis of the results from the activity of the MOL and its territorial services. Table 6.3 provides the performance requirements to be met by the IS „EVF”.

Table 6.2. Performance requirements of the information system

| ID | Binding nature | Requirement |
|----------|----------------|--|
| PERF 001 | M | The response time to a transactional query of the externa user/service should not exceed 3 seconds (it does not refer to generation of reports). |

| ID | Binding nature | Requirement |
|----------|----------------|---|
| PERF 002 | M | IS „EVF“ should be able to manage up to 300 concurrent sessions (connections of authorized users and external systems) with the possibility of scalability up to 1000 concurrent sessions during the extension of the information system. |
| PERF 003 | M | The Provider will include in the guideline for administration and operation of the IS „EVF“ information regarding the processes that may decrease the performance of the IS „EVF“ and its recommendations regarding the concurrent carrying out of these processes (example: it is not recommended to roll out the process X of generating daily reports, simultaneously with the process Y of generating the backup copies). |
| PERF 004 | M | Generation of reports and accessing information for the purpose of business analyses should not influence the operational performance of the information system at the level of transactions' processing. In the documentation of the information system, there will be identified the reports with significant impact on performance and Provider will formulate recommendations for generation of the respective reports, so as not to influence the performance indicators of the IS „EVF“. |
| PERF 005 | M | The Provider will indicate in its bid the minimum values guaranteed for performance characteristics of the IS „EVF“, referring to the recommended technological platform. |
| PERF 006 | M | IS „EVF“ should have the capacity to process at least 50 000 transactions per day. |

During the use of IS „EVF“, it is possible that the number of processed transactions and competing users will increase or decrease significantly from one period to another. In order to have a rational use of processing resources, the information system must be easily scalable (up and down). Table 6.4 contains requirements on the scalability characteristics related to IS „EVF“.

Table 6.4. Information system scalability requirements

| ID | Binding nature | Requirement |
|--------|----------------|--|
| SR 001 | M | IS „EVF“ will allow the processing capacity to be increased without interrupting its operation. To this end, the system will support the horizontal expansion of processing capacity (example: adding new server nodes and balancing the load). |
| SR 002 | D | IS „EVF“ can be configured for automatic scaling of key components (lag sensitive). The scaling of the system will be done both up and down. |
| SR 003 | M | IS „EVF“ must be able to serve an unlimited number of transactions, with the condition that the appropriate allocation of data processing and storage resources is provided. Resources will be allocated horizontally (allocation of new servers, without increasing performance on existing servers). |

Software, hardware and communication channel requirements

Table 6.5 contains the software, hardware and communication technology insurance requirements for the implementation of IS "EVF".

Table 6.5. Categories of specification requirements

| ID | Binding nature | Requirement |
|-----------|-----------------------|---|
| SHC 001 | M | IS "EVF" must be able to be installed on both dedicated servers and virtualization solutions (IS "EVF" must be in accordance with the requirements for the deployment of information systems on the common government technology governmental service MCloud). |
| SHC 002 | M | It is necessary to demonstrate the virtualization capability by delivering to MOL an image of the system that can be uploaded and becomes functional with minimal configurations on one of the existing virtualization solutions available on the market. |
| SHC 003 | M | The provider will demonstrate the possibility of installing and operating IS "EVF" within the MCloud infrastructure. |
| SHC 004 | M | IS "EVF" must be accessible on communication channels of at least 512Kbps. |
| SHC 005 | D | For the development and operation of IS "EVF" it is welcome to use portable FOSS (free open source software) platforms on UNIX and WINDOWS operating systems. |
| SHC 006 | M | The Provider will explicitly indicate in the offer the software platform on the basis of which IS "EVF" is to be developed and the software platform necessary for its operation. |
| SHC 007 | M | The technologies proposed by the Provider must be accessible for at least 3 companies specialized in the development of software solutions operating on the local market of the Republic of Moldova. |
| SHC 008 | M | If the software platform for the development and operation of IS "EVF" is based on commercial IT solutions that require licensing, the Provider will include in the price offer the cost of all licenses necessary for the development and operation of IS "EVF" (the Provider must purchase on behalf of MOL all the licenses necessary for the development and operation of the IT system). |
| SHC 009 | M | If the software platform for the development and operation of IS "EVF" is based on commercial IT solutions that require licensing, the Provider will include in the price offer the delta of licensing costs in case of: <ul style="list-style-type: none"> • doubling the number of users; • doubling the number of processing units (CPU or CPU cores); • doubling the number of application server nodes/ database. |
| SHC 010 | M | IS "EVF" will use open standards for formats and communication protocols. |
| SHC 011 | M | The services exposed to the public by IS "EVF" will be technologically neutral (Operating System, Internet explorer, etc.). |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SHC 012 | M | The recommended generic program product for operation and interaction with IS "EVF" is the WEB explorer. |
| SHC 013 | M | The system will be compatible with at least 2 of the latest versions of the following web browsers: MS Internet Explorer / MS Edge, Mozilla Firefox, Google Chrome, Safari and Opera. |
| SHC 014 | M | Compatibility with MS Internet Explorer / MS Edge WEB Explorer is compulsory. |
| SHC 015 | D | IS "EVF" will incorporate a Heart-beat service that will periodically communicate the normal working state of the system. |
| SHC 016 | M | IS "EVF" will include configurable means of technical logging. |
| SHC 017 | M | The system must be able to produce at least the following levels of technical logging: info; warning; critical; error. |
| SHC 018 | M | The Provider will enumerate the means that will be used for the technical troubleshooting of the system. |
| SHC 019 | M | The Provider will prepare means to facilitate the administration of the system: <ul style="list-style-type: none"> • starting of the system components; • stopping of the system components; • restarting the system components; • creating the database backup copy; • restore the data from the indicated backup copy; • refreshing the operational memory of the system. |
| SHC 020 | M | IS "EVF" will operate in TCP / IP networks and especially HTTPS. |
| SHC 021 | M | Communication between all IS "EVF" components will be secured, using the internal interfaces of the system components for this purpose. |
| SHC 022 | M | The Provider will suggest other network services and utilities required to operate the system. |

Licensing and intellectual property requirements

MOL will hold all the necessary rights for using for undetermined period of time the information system *IS „EVF“* and of all soft components necessary for the good functioning of the *IS „EVF“*.

Table 6.6. contains the specification of requirements related to licensing and intellectual property rights related to the *IS „EVF“* and soft components necessary for the system operation.

Table 6.6. Requirements for licensing and intellectual property

| ID | Binding nature | Requirement |
|-----------|-----------------------|---|
| LIPR 001 | I | MOL ensures the following operation environments for the IS „EVF“: <ul style="list-style-type: none"> • Production environment; • Testing/training environment; • Development environment. |
| LIPR 002 | M | <i>The Provider</i> will include in its financial offer the licenses for all soft products of COTS type, which are necessary for implementation and use of the IS „EVF“ in those three environments provided to MOL. The following are included here: operation systems, database management systems, software libraries, utilities and other system soft. |
| LIPR 003 | M | The quantity of provided licenses should allow accessing and using IS „EVF“ (in any environment in which it operates) of at least 20000 nominal users, as well as unlimited by external systems. There will be no restrictions regarding the number of documents, transactions or accessing modality for the IS „EVF“ (e.g. <i>limitations in concurrent accessing</i>). |
| LIPR 004 | M | Quantity of provided licenses should allow accessing the APIs exposed by SI „EVF“ by any application and external system. |
| LIPR 005 | M | <i>The Provider</i> will transfer to MOL all the rights for developments, adjustments, setups and customizations carried out for implementing the IS „EVF“ according to requirements. They may refer to third licensed soft products or may be components developed within the project. |
| LIPR 006 | M | Any data stored in the database related to the IS „EVF“ represent the property of the MOL. Access to these data over the entire provider's contacting period, as well as afterwards, is subject to information confidentiality requirements and clauses. |
| LIPR 007 | M | <i>The Provider</i> will present its licensing model suggested for the IS „EVF“ which should be in line with the requirements LIPR 001 – LIPR 006. The <i>Provider</i> will describe the suggested licensing model, reasoning why it is the most optimal one for the MOL. Will present a comparative analysis with other licensing models provided usually for the tendered solution. |

Interoperability requirements

The interoperability of the IS „EVF“ represents the characteristic of the information system to communicate with other information applications. The system architecture sets interfaces which should exist between the IS „EVF“ and other systems of the MOL or of public authorities from the Republic of Moldova. Table 6.7 defines the requirements regarding the interoperability characteristics of the IS „EVF“ requested by MOL.

Table 6.7. Requirements of the interoperability framework of the information system

| ID | Binding nature | Requirement |
|---------|----------------|--|
| INT 001 | M | All the interfaces exposed by the <i>IS „EVF“</i> should be based on open standards. All the flows of messages between the <i>IS „EVF“</i> and external entities shall be carried out using open standards. |
| INT 002 | M | <i>IS „EVF“</i> will have the capabilities to implement the interfaces through <i>MConnect</i> . |
| INT 003 | M | <i>IS „EVF“</i> will be integrated at the implementation with the following internal systems: <ul style="list-style-type: none"> • RCFI; • <i>IS „Collaborator“</i>; • <i>IS „MAO“</i>; • Cognitrom Assessment System. |
| INT 004 | M | <i>IS „EVF“</i> will be integrated at the implementation with the following external systems: <ul style="list-style-type: none"> • MPass; • MSign; • MNotify; • MLog; • MPower; • Open Data Portal; • State Register of Population; • <i>IS „PAPIR“</i>. |
| INT 005 | M | All the interfaces provided by the <i>IS „EVF“</i> will interact with external applications instantly or in a programmed way through specialized jobs. |
| INT 006 | M | <i>IS „EVF“</i> will have the capability to define new standard interfaces to access all the key business functions of the system (example: generation of documents, generation of transactions, accessing information about business entities stored in the <i>IS „EVF“</i>). The respective interfaces should allow managing business entities by applying all the relevant business rules and using all the characteristics related to business entities. |
| INT 007 | M | <i>IS „EVF“</i> will have capabilities to define new interfaces to access external systems with use of open standards. These interfaces will be accessible under the functions of the system, when implementing the functionalities of the <i>IS „EVF“</i> . |
| INT 008 | D | <i>IS „EVF“</i> will have standard interfaces to export data within the tools of <i>Data Warehouse</i> type. |
| INT 009 | M | All the interfaces of the system should be adequately documented (example: applying model <i>Web Services Description Language</i>). |

IS „EVF” should take into account the related aspects regarding the used information technologies and initiatives in the area which are in force on the territory of the Republic of Moldova. The requirements relevant in this respect are specified in table 6.8.

Table 6.8. Requirements related to ICT related aspects and initiatives in the area

| ID | Binding nature | Requirement |
|---------|----------------|---|
| INT 010 | M | IS „EVF” will integrate with the interoperability governmental service <i>MConnect</i> to consume data from external information systems (example: extracting data from state registers). |
| INT 011 | M | IS „EVF” will use <i>MPass</i> governmental service as a mechanism for users to log in through electronic or mobile signature. |
| INT 012 | M | IS „EVF” will use <i>MSign</i> governmental service as infrastructure to use the electronic signature. |
| INT 013 | M | IS „EVF” will use <i>MLog</i> governmental service as a mechanism to log critical business events. |
| INT 014 | M | IS „EVF” will use <i>MNotify</i> governmental service as mechanism to notify users. |
| INT 015 | M | IS „EVF” will use <i>MPower</i> governmental service as mechanism to verify authorized users’ powers to perform specific actions in user’s interface. |
| INT 016 | M | IS „EVF” will integrated with Open Data Portal (https://date.gov.md) for the purpose of publishing open data produced within implemented workflows. |

Data migration and popular requirements

Table 6.9. contains the migration and popular data requirements in IS „EVF”. It should be mentioned that the acceptance of the IT system will be achieved after populating the database with the data sets provided by the MOL.

Table 6.9. Data migration and popular requirements

| ID | Binding nature | Requirement |
|---------|----------------|--|
| MIG 001 | M | MOL will prepare and deliver the necessary data and metadata sets to the population with primary data of IS „EVF”. The format of the migrated data will be agreed with the Provider. |
| MIG 002 | M | The Provider will need to convert specific values of the metadata related to the external data sets according to the MOL metadata system. |
| MIG 003 | M | The Provider will include in the technical offer its approach on the procedure for implementing the initial migration and popular procedure of the database. |
| MIG 004 | M | The Provider must provide a mechanism that will ensure the automated population of the IS „EVF” database with relevant metadata (nomenclatures, classifiers, variables of various kinds, etc.) and the |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| | | primary data sets provided by the MOL in order to consolidate the initial data stock of IS „EVF“. |
| MIG 005 | M | <p>During the implementation of the migration and popular data procedure the Provider is responsible for:</p> <ul style="list-style-type: none"> • defining the methodology used in the migration and popular data process; • elaboration of detailed migration and popular data plans; • providing software mechanisms for data migration and population; • defining the quality requirements for the migration / population data sets and processing them through the developed migration and population mechanisms; • mapping the value of metadata received from external sources (in case of divergences); • defining the criteria for reconciling migrated and populated data; • participation in the process of data cleansing and enrichment; • checking and validating the quality of the data sets to be migrated and populated; • the primary population of the IS „EVF“ database based on the data sets provided by the MOL; • identifying and resolving exceptions / errors during the migration and popular data process. |
| MIG 006 | M | <p>The Provider must propose to the MOL the data migration and population methodology. The methodology must contain the following elements:</p> <ul style="list-style-type: none"> • methodology for preparing of the data to be migrated and populated; • methodology for mapping of the migrated and populated data; • methodology for cleansing and enriching migrated / populated data and ensuring their quality; • methodology for completing the value of the data required by IS „EVF“ but which are missing in the data sets provided; • automated migration and population data procedure; • principles of reconciling migrated and populated data; • recovery plan in case of failure (for each stage of the migration and popular data process); • delivery plan of the data migration and population mechanism. |
| MIG 007 | M | <p>The Provider must prepare and deliver the detailed migration plan and initial population with data of IS „EVF“ (migration and data conversion strategy). This plan must be aligned with the IS „EVF“ implementation plan.</p> |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| MIG 008 | M | The Provider must deliver to the MOL a software solution designed to automate the initial migration and population processes with IS „EVF” data. |
| MIG 009 | M | All migration and initial population activities of IS „EVF” with primary data must be performed in the operating environment controlled by the MOL. The data will never leave the MOL's ICT infrastructure. |
| MIG 010 | M | In the migration process, the Provider will conform the security policy of the MOL. |
| MIG 011 | M | The Provider will demonstrate the correctness of the initial migration and population instrumentation with IS „EVF” data to the MOL specialists (an act of acceptance of the migration and initial population with IS „EVF” data is to be signed between the Provider and the MOL). |

Requirements for security assurance

IS „EVF” should allow adequate control over the security risks of the information to be used. The implemented security measures should be aligned to security policies approved in the MOL and shall ensure the prevention, identification, and adequate reaction to security incidents.

IS „EVF” should implement an approach of „Multi-layered security” type at the level of the system and to have the capacity to get integrated in the institutional model of the MOL for information security management (based on standard family ISO 27000).

This compartment (Table 6.10-6.16) provides the requirements for the security characteristics related to the system, related to IS „EVF”.

Table 6.3. Requirements for security architecture

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 001 | M | The architecture of the IS „EVF” should be established by applying an approach of the type „Secure by design”. |
| SEC 002 | M | The security architecture of the IS „EVF” should be documented at the technical level. |
| SEC 003 | M | The documentation will contain the description of the implemented security model, present components and the role of every component from security point of view. |
| SEC 004 | M | The documentation will contain the peculiarities for placing at the network level the components of the IS „EVF” and the recommendations of the Provider regarding the access rules to the network, to be set by MOL for secured access to all the system components (example: communication between services matrix). |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 005 | M | All the system processes related to the components of the IS „EVF“ will roll out with minimum privileges necessary for carrying out the attributed tasks. |
| SEC 006 | M | All the access credentials used by the information system should be set in administrative interfaces. IS „EVF“ will not contain hard-coded access credentials. |
| SEC 007 | M | IS „EVF“ will not contain open access credentials at the level of its components (based on data, configuration files). |
| SEC 008 | M | All the interfaces of the IS „EVF“ will be accessed applying safe login methods (example: X.509 certificate). |
| SEC 009 | M | The access to functions provided to unauthenticated users (public interface provided by IS „EVF“) should be controlled with protection means against the over-demand of the service by one or several nodes of the network. |
| SEC 010 | M | The field content in the forms filled in by the users should be valid on binding basis on the client computers and on the server. |
| SEC 011 | M | IS „EVF“ will be secured for OWASP Top 10 vulnerabilities (2017). |
| SEC 012 | M | IS „EVF“ will ensure confidentiality of data which are sent-received on communication channels. |
| SEC 013 | M | Users' actions should be registered in electronic logs. |
| SEC 014 | D | IS „EVF“ will issue a periodical signal, which indicated its functional status. |

Table 6.4. Requirements for the authentication mechanism

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 015 | M | IS „EVF“ will allow accessing its functions only after the successful authentication of the user. IS „EVF“ will provide support for at least the following authentication methods: based on login and password, Windows authentication (integration with Active Directory), two step authentication (2FA) and authentication through electronic or mobile signature (MPass). IS „EVF“ will allow the users to change individual passwords. |
| SEC 016 | M | IS „EVF“ will allow registering users and profile information related to them (example: login, password, name, surname, IDNP, Email etc.). |
| SEC 017 | M | Users' passwords should be protected. Protection method for passwords should ensure the impossibility of their wiretapping, deduction or recovery. |
| SEC 018 | D | IS „EVF“ will allow differentiated application of policies to use passwords for different groups of users. |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 019 | M | IS „EVF“ will allow blocking, deactivating or suspending users' accounts at the application level. |
| SEC 020 | M | IS „EVF“ will be integrated with the LDAP solution implemented in the MOL for internal users. When creating a new user account, the IS „EVF“ will have the option to select from the list of users available in the directory service. |
| SEC 021 | M | IS „EVF“ will be able to be integrated with external services of Identity Services Providers type. For this purpose, standards and open protocols in the area will be used (example: SAML). Authentication methods to be supported with the involvement of an external ISP are: <ul style="list-style-type: none"> • login and password; • Certificate X.509; • OTP (One Time Password). • MPass government service must be used as a ISP solution. |
| SEC 022 | M | When using mobile applications, the access will be carried out based on access credentials of an user and a unique key set in the client application configuration. Communication with the IS „EVF“ served will be encrypted. |
| SEC 023 | D | IS „EVF“ will allow the differentiated application of authentication methods, depending on accessed resources (example: implicit electronic or mobile signature for authentication of candidates, login and password for the employees of the REC, OTP for the administrative interface). |
| SEC 024 | M | IS „EVF“ will allow setting the number of simultaneous connections to be initiated by one user. |
| SEC 025 | M | IS „EVF“ will allow setting the time for expiration of users' sessions in case of inactivity. |
| SEC 026 | M | IS „EVF“ will have efficient mechanisms to prevent the unauthorized taking over of active sessions initiated by authorized users. |
| SEC 027 | M | The working session in the IS „EVF“ will be blocked upon the user's request or automatically, upon the expiry of the time set for the session. |

Table 6.5. Requirements for the authorization mechanism

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 028 | M | IS „EVF“ will allow the granular management of the access rights to all its objects and possible actions for them (example: electronic forms, menus, reports, actions to create/view/update/remove etc.). |
| SEC 029 | M | The authorization method within the system will be based on the principle „everything which is not explicitly allowed is prohibited“. |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 030 | M | IS „EVF“ will allow defining the groups of users, roles and association of users to these groups and roles. |
| SEC 031 | M | IS „EVF“ will allow providing access rights at the level of explicit user, group and role. A group of users will be able to contain more subgroups/roles. One user may be associated to one or more groups and roles, its access rights being determined cumulatively. |
| SEC 032 | M | IS „EVF“ will allow providing access rights based on business rules (example: modification of the document only if the user is author or if the operation is performed within a certain time interval, condition or context). |
| SEC 033 | M | IS „EVF“ will allow attributing temporarily the rights held by one user towards another user. This attribution will be able to be performed by keeping or suspending the rights held by users to whom these rights are delegated. |
| SEC 034 | D | IS „EVF“ will allow segregating the administrative activities (example: Administrator 1 modifies, Administrator 2 confirms). |
| SEC 035 | M | IS „EVF“ will provide views and reports regarding the set access rights. It will be possible to set parameters for them depending at least on the following criteria: group of users/roles, user login, admitted actions, etc. |
| SEC 036 | M | IS „EVF“ will have the capabilities to authenticate and authorize users through internal mechanisms, as well as through MPass governmental service. |
| SEC 037 | M | IS „EVF“ will authorize authorized users' access to sensitive compartments of the interface and data after verifying their rights through MPower. |

Table 6.16. Requirements for the mechanism of validating the entry/exit data

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 038 | M | IS „EVF“ will have an adequate mechanism for preventing the manipulation of entry data (entry data coming from authorized users, entry data coming from external applications). |
| SEC 039 | M | All the actions for modifying critical and sensitive data in the IS „EVF“ will be carried out through specialized forms and documents, according to the workflow set for these categories of documents (example: correcting data in the filled in and signed questionnaire). |
| SEC 040 | M | IS „EVF“ will carry out the complete and independent validation of data at the level of presentation, level of business logic, level of data, so as to ensure integrity, completeness and correctness of data. |
| SEC 041 | M | All the displays of data within the IS „EVF“ should be accompanied with security mark, according to a classifier set for this purpose in the IS „EVF“. |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 042 | M | Confidential data will not be stored and accessed in unsecured way in the IS „EVF“ (example: log files, caching etc.). |
| SEC 043 | M | IS „EVF“ will have mechanisms for additional protection of especially confidential data (example: concealed display of data, storage of data in encrypted form, repeated authentication or use of additional means by user, etc.). |
| SEC 044 | M | IS „EVF“ will have routine procedures to verify and detect possible corruption of data integrity relations. |
| SEC 045 | M | IS „EVF“ will have adequate mechanisms to prevent manipulation of data stored in the application. |

Table 6.7. Requirements for the log and audit mechanism

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 046 | M | IS „EVF“ will have audit components which will collect and managed in a centralized way the audit entries at the level of every information system module. |
| SEC 047 | M | The audit component will allow granular setting of audit policies. |
| SEC 048 | M | IS „EVF“ will allow establishing audit policies at the level of functional component/user interface compartment, categories of data and level of logged event. |
| SEC 049 | M | IS „EVF“ will allow establishing characteristics which are specific for events to be logged (example: produced within a certain time interval, which are in a specific status or which transit a certain status, etc.). |
| SEC 050 | M | IS „EVF“ will allow auditing any event, at the level of any object or business entity from the information system. |
| SEC 051 | M | Every audit entry will contain at least: <ul style="list-style-type: none"> • time when the event was produced; • event's subject (user identifier); • impacted object or entity; • occurred event; • IP address from where the event was initiated. |
| SEC 052 | M | Audit entries will not contain confidential data (example: passwords entered for failed authentication attempts). |
| SEC 053 | M | Errors which may occur when logging audit entries should not influence the normal functioning of the information system. |
| SEC 054 | M | The audit component will use the system clock set at the level of the operation system of the application server in which the component operates. |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| SEC 055 | M | The audit component will have a mechanism for archiving past audit entries. Parameters can be set for the archiving process (frequency, length of data, archiving format, destination, etc.). |
| SEC 056 | D | IS „EVF“ will be able to generate automatically notifications to persons responsible for producing certain security events, according to set configurations. |
| SEC 057 | D | It will be possible to integrate the audit component in the basis of open standards with solutions of SIEM type (Security Incident and Event Management) so as to take over the audit entries produced within the system, by the respective solutions. |
| SEC 058 | M | IS „EVF“ will allow fixing the historical versions of data, which will be considered to be very sensitive. |
| SEC 059 | M | The activities for changing entries' status and responsible will be logged. |
| SEC 060 | M | IS „EVF“ will have convenient tools to access and process logged events, including filtering the audit entries according to held fields and to export them in usual format. The audit tools of the information system will be used also for the purpose of importing archives with audit files for occasional analysis activities. |
| SEC 061 | M | IS „EVF“ will have safe mechanisms for protecting entered audit information integrity. |
| SEC 062 | M | Critical business events should be logged in parallel through MLog log service. |
| SEC 063 | M | IS „EVF“ will provide a mechanism to set business events which will be logged in parallel through the MLog governmental service. |

Table 6.8. Requirements for the mechanism to manage exceptions and errors

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 064 | M | IS „EVF“ will register in a centralized way all the exceptions and errors generated by its components. |
| SEC 065 | M | When an error occurs, the IS „EVF“ will display a generic error message for the user. It may contain an error code and a single identifier of the error, to facilitate the involvement of support services. |
| SEC 066 | M | IS „EVF“ will have the necessary tools for analysis and processing of entries related to exceptions and errors. |
| SEC 067 | M | IS „EVF“ will be able to generate automatically notifications to persons responsible for producing certain errors in the operation of its components. |

Table 6.16. Requirements for the resilience capabilities and continuity of the IT system

| ID | Binding nature | Requirement |
|---------|----------------|---|
| SEC 068 | M | IS „EVF” will have implemented tools for executing the procedures for automatic backup generation and historical backup management. |
| SEC 069 | M | IS „EVF” must have mechanisms to ensure the integrity of the data in the event of any component failures. |
| SEC 070 | M | IS „EVF” must have mechanisms to operatively restore availability and accessibility in the event of continuity incidents. |
| SEC 071 | M | IS „EVF” architecture must be resistant to component failures and not have single points of failure (SPOF). |
| SEC 072 | M | IS „EVF” must have mechanisms to ensure data integrity in the event of accidental drops in any of its components. |
| SEC 073 | M | IS „EVF” must have mechanisms to operatively restore the availability and accessibility in the event of continuity incidents. |

Requirements for the deployment of the IT system

Table 6.17 contains the requirements regarding the deployment mechanisms of the IS „EVF” to be implemented by the Provider. These correspond to the recent requirements for the IT systems of the central public authorities of the Republic of Moldova.

Table 6.17. Requirements for the deployment of the IT system

| ID | Binding nature | Requirement |
|---------|----------------|--|
| DEP 001 | M | IS „EVF” must be able to be installed on dedicated servers and in virtualized media. |
| DEP 002 | M | IS „EVF” must be able to provide a containerized infrastructure for deployment on relevant media (example: Docker Engine, Kubernetes). |
| DEP 003 | M | IS „EVF” must be able to initiate deployment on several media simultaneously (example: development, testing, production) initiated from scratch. |
| DEP 004 | M | The deployment of the IS „EVF” must be carried out through specialized instruments. |
| DEP 005 | M | The deployment mechanism of the IS „EVF” must be able to define the component of the container to be updated (example: new version of the platform software, updated functional mode, etc.). |
| DEP 006 | M | The deployment mechanism of the IS „EVF” must be able to manage the contents of the container. |
| DEP 007 | M | The deployment mechanism of the IS „EVF” must be able to add new components to the contents of the container. |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| DEP 008 | M | For the deployment of the IS „EVF” it is necessary that the deployment mechanism can specify in which cluster (dedicated server or cloud) the deployment must be performed. |
| DEP 009 | M | For the deployment of the IS „EVF” it is necessary that the deployment mechanism provides workflow for compiling the code or registers. |
| DEP 010 | M | The deployment mechanism of the IS „EVF” should provide functionalities for the delivery of the IT solution and performance of third party actions (example: installation of additional packages, configuration of notifications, etc.) using existing tools. |
| DEP 011 | M | The production environment of the IS „EVF” must be able to be automatically updated with the possibility of manual intervention (manual build approval). |
| DEP 012 | M | The developer will deliver to the MOL all the tools and scripts necessary for the automated deployment of IS „EVF”. |

Requirements for the documentation

IS „EVF” will be accompanied by a complete set of technical documentation comprising the compartments included in table 6.18.

Table 6.18. Requirements for the documentation of the IT system

| ID | Binding nature | Requirement |
|---------|----------------|--|
| DOC 001 | M | The Provider will prepare and publish interactive guidance materials included in the user interface of IS „EVF”. |
| DOC 002 | M | The Provider will prepare and deliver the user manual in Romanian language. |
| DOC 003 | M | The Provider will prepare and deliver the administrator guide in Romanian language. |
| DOC 004 | M | The Provider will prepare and deliver the system installation and configuration guide (which includes at least code compilation, application installation, hardware and software requirements, platform description and configuration, application configuration, disaster recovery procedures). |
| DOC 005 | M | The Provider will prepare and deliver the technical project of the delivered IT system based on which all the development / acceptance activities of the IT system (SRS and SDD) will be performed. |
| DOC 006 | M | The Provider will prepare and deliver the System Architecture documentation with the description of the models in UML language, including a sufficient level of detail of the architecture in several sections (including the logical and physical model of the data). |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| DOC 007 | M | The Provider will prepare and deliver the documentation of the consumed and exposed APIs for integration with external IT systems. |
| DOC 008 | M | The Provider will deliver all the instructions necessary for the proper operation of IS „EVF” and solution of any technical problems/ |
| DOC 009 | M | The Provider will deliver the source code for the applications and components developed within the project with the necessary comments to understand the program code. |
| DOC 010 | M | The Provider will deliver the training documentation for all roles of users of IS „EVF”. |

Requirements for warranty, maintenance and technical support of the IT system

The Provider will provide post-implementation warranty and technical support that includes the compartments included in table 6.19.

Table 6.19. Requirements for the maintenance of the IT system

| ID | Binding nature | Requirement |
|---------|----------------|--|
| GMS 001 | M | The developer will provide warranty and technical support for 12 months after the final acceptance of IS „EVF”. |
| GMS 002 | M | The guarantee and technical support will correspond to the national standard SM ISO /IEC 14764: 2015 - Software engineering. Software life cycle processes. Maintenance. |
| GMS 003 | M | The developer will provide MAI with a Help Desk service available on all the working days of the year. |
| GMS 004 | M | MOL users will be able to call the Help Desk service at a national telephone number (which corresponds to the telephone number of the Republic of Moldova). |
| GMS 005 | M | Language of communication with the Help Desk service - Romanian or Russian. |
| GMS 006 | M | MOL users will be able to alternatively report technical problems caused by ticketing mechanism, Email or instant messages. |
| GMS 007 | M | The Provider will provide documentation support for technical issues and their traceability to the MOL. |
| GMS 008 | M | The deadline for responding and remedying the reported technical problems will not exceed 8 hours from their reporting. |
| GMS 009 | M | In case of problems of major complexity, the term for their solving will not exceed 72 hours. |

| ID | Binding nature | Requirement |
|---------|----------------|---|
| GMS 010 | M | Support services will be provided remotely. If necessary, the Provider's specialists will travel to the MOL headquarters. |
| GMS 011 | M | For the provision of post-implementation support and maintenance services, the Provider will provide the MOL with an application platform, available for users of the IT system through the Internet. |
| GMS 012 | M | The application platform will be adequately secured. All interactions between the Provider and the MOL in the provision of support and post-implementation maintenance services will be performed through the respective platform. |
| GMS 013 | M | The Provider will monitor the quality of post-implementation support and maintenance services and will react to the allowed deviations in order to prevent them. |
| GMS 014 | M | The Provider will submit monthly reports to the MOL on the services provided and their level. The reports will also contain information on the actions taken by the Provider or planned, in order to improve the quality of services. |
| GMS 015 | M | The Developer will demonstrate the ability to provide post-delivery technical support in accordance with GMS 001-GMS 014 requirements. |
| GMS 016 | M | Any program errors detected during the warranty period will be remedied by the Developer free of charge and in a timely manner. |
| GMS 017 | M | In case of additional implementation requests, they will be subject to an amendment to the contract and payment of the value of the services. |
| GMS 018 | M | The Provider and the MOL will sign an SLA that will specify in detail the principles of providing warranty, maintenance and support services. |

7. Final product and delivered components

The final product (IS „EVF“) consists of software artifacts and system documentation as well as the transfer of knowledge to the owner, holder and administrator of the software solution. The artifacts related to the IS „EVF“ deliverables are specified in table 7.1.

Table 7.1. List of project deliverables

| ID | Binding nature | Requirement |
|-----------|-----------------------|--|
| DEL 001 | M | The complete source code of the modules and components required to compile the delivered program product. |
| DEL 002 | M | Software solution of the primary data migration and population in IS „EVF“. |
| DEL 003 | M | The final product packaged for easy installation into the proposed technological environment (including automated deployment scripts). |
| DEL 004 | M | Documents and reports related to the project management processes for the design, development and implementation of IS „EVF“. |
| DEL 005 | M | Technical Project (SRS+SDD). |
| DEL 006 | M | Document on the deployment and configuration of IS „EVF“. |
| DEL 007 | M | User Manual |
| DEL 008 | M | Administrator's Manual (including contingency plan). |
| DEL 009 | M | Guide for the removal of faults and current maintenance activities of IS „EVF“.. |
| DEL 010 | M | All materials related to IS „EVF“ users' training. |
| DEL 011 | M | Technical specifications for interfaces consumed and published by IS „EVF“ . |
| DEL 012 | M | Test plan and internal test results (functional, integration, performance, loading, security). |
| DEL 013 | M | SLA agreement signed with the MOL for the period of maintenance, warranty and support. |
| DEL 014 | M | All artifacts are to be delivered electronically (DVD + -R). |

In addition to the artifacts related to the deliverables will be provided a series of services necessary for the transfer of knowledge to the MOL contained in table 7.2.

Table 7.2. Knowledge transfer services related to the delivered artifacts

| ID | Binding nature | Requirement |
|-----------|-----------------------|--|
| DEL 015 | M | The Provider will develop and deliver training programs for all relevant categories of MOL users. |
| DEL 016 | M | The Provider will establish in agreement with the MOL the Plan for organizing the training sessions. |
| DEL 017 | M | The Provider will perform user training according to the training plan and programs agreed jointly with the MOL. The training will be conducted in Romanian. |
| DEL 018 | M | The Provider will train a target group of users - trainers who will provide support and continue the trainings after the production of IS „EVF“. |

| ID | Binding nature | Requirement |
|---------|----------------|--|
| DEL 019 | M | The Provider is to perform training activities for all categories of authorized users and system administrators. |
| DEL 020 | M | <p>The training and documentation phase involves ensuring the following categories of deliverables:</p> <ul style="list-style-type: none"> • training on the business use of IS „EVF“ (users with non-administrator role); training for administration and configuration IS „EVF“ (users with administrator role); • complete guides for all categories of IS „EVF“ users intended for the operation and administration of the IS „EVF“ IT system. |
| DEL021 | M | The Provider is to provide technical assistance services during the pilot period of IS „EVF“ (period of stabilization of the IT system). |
| DEL 022 | M | The Provider will assist the MOL in the acceptance testing activities of IS „EVF“. |
| DEL 023 | M | The Provider is to provide services to assist the MOL in the processes of putting IS „EVF“ into production. |
| DEL 024 | M | The Provider is to eliminate all deficiencies and errors of the IS „EVF“ identified during the stabilization period and in the acceptance test. |
| DEL 025 | M | The Provider is to provide post-implementation technical support (after putting the system into production) for a period of 12 months, including corrective, adaptive and preventive maintenance, in accordance with MS ISO / IEC 14764: 2015 - Software engineering. Software life cycle processes. Maintenance. |

8. Stages of implementing the IT system

The activities of design, development, testing and implementation of IS „EVF“ must be performed by enterprises and specialized institutions that have the necessary experience to perform the appropriate work and will include the following stages:

1. **The stage of elaboration of the IT system** - which will be divided into phases coordinated with the MOL and UNDP as follows:
 - a. The Provider analyzes the terms of reference, performs the business analysis and with the approval of the Direct Beneficiary (MOL), proposes its vision for the development of the IT system through a Technical Project (SRS and SDD) developed within 1.5 calendar months;
 - b. The Provider develops the program code and integrates the modules developed in a prototype version of IS „EVF“ (a first presentation will be made to the parties demonstrating the existence of all functionalities described in this specification) which will then be refined until the final acceptance is signed. The stage in question will not exceed 7 months;
 - c. The Provider performs the initial migration and population activities with data of IS „EVF“ (1 calendar month);
 - d. The Provider tests the system in laboratory mode (internal testing) and prepares the accompanying documentation (presents the functionalities of the system with corrections and adjustments to the objections made in the previous sub-stage, presents the set of technical documentation, etc.). The stage in question will last 3 weeks. Testing must include the following steps:
 - the totality of the test scenarios regarding the satisfaction of all the functional requirements of the computer system (*functional testing, unit testing, integration testing*) will be jointly verified;
 - *stress testing, load testing* and *security testing* scenarios are applied to the system in order to verify the degree of its compliance with the MOL expectations and the provisions of this specification;
 - based on the test results, in case of need, the required adjustments and modifications will be operated, preparing an improved version of the IT system.
 - e. The Provider performs the activities of deployment and configuration of the 3 environments of IS „EVF“ (Production environment, Testing / training environment, Development environment). The given activity will last up to 1 week.
2. **Training stage** will begin with the completion of the acceptance tests and will include the training of 2 users with the role of System Administrator, 2 trainers for the subsequent training of authorized users and up to 30 authorized users with all configured roles.
3. **Stabilization stage of IS „EVF“** will begin with the approval of the minutes of acceptance by the MOL in the presented version and the signing of the act of putting into production of the IT system. This stage will last 3 months during which the Provider will assist the MOL in the operation of IS „EVF“ and will perform activities to eliminate errors / deficiencies detected as well as optimizations in the operating parameters of IS „EVF“.
4. **Commissioning of the system** shall begin with the signing of the act of commissioning of the IT system and the beginning of its operation.

- 5. Maintenance and support guarantee stage** is the period in which the Provider assumes the obligation towards the MOL to assist it in maintaining the capacity of the IT system to provide services, as well as the modification of the product (elimination of errors and optimization of operating parameters), preserving its integrity. In the case of IS „EVF”, 12 calendar months of warranty, maintenance and technical support are required.

9. Requirements for completing offers

9.1. Requirements regarding the institutional power of Providers

The competition is open to companies specialized in providing IT services with at least 5 years of experience in the field. The companies should be legally registered entities and can ensure rapid local response (including presence of staff) to any of the contract related requests (whether through a local branch or office, through a local consortium partner or a local subcontracted consultant or company or other – all relationships to be documented through official documents and valid contracts submitted with the Proposal).

Interested entities must submit a technical and price offer containing:

- Form A: Technical Proposal Submission Form
- Form B: Bidder Information Form
- Form C: Joint Venture/Consortium/ Association Information Form
- Form D: Qualification Form
- Form E: Format of Technical Proposal
- Form F: Financial Proposal Submission Form
- Form G: Financial Proposal Form

9.2. Requirements regarding the institutional power of Provider

All discussions with the MOL representatives will be conducted in Romanian language. All related documentation, training and technical support will be done in Romanian language. All collaborators involved in the project who interact directly with the representatives of the MOL must have a perfect command of the Romanian language.

In the technical offer, the Provider will present the data regarding the personnel involved in the project and their qualification. The involvement of qualified personnel with experience in the development and implementation of information systems of similar complexity within the CPA of the Republic of Moldova is welcome.

- The persons employed in the following key positions will be explicitly presented: Project Manager; System Architect; Senior Developer; Tester; Designer.

For these positions, the CVs of the trained persons will be presented, considering that the experience of the team members should include:

1. Project Manager.

University degree in Management, Engineering, ICT or another relevant field, with the following experience:

- At least 5 (five) years of experience in project management of projects on developing IT applications/systems, services;

- Experience in a similar position in at least 2 (two) similar projects;
- Relevant experience in business process analysis;
- Ability to communicate in Romanian or Russian, and English languages;
- Having an internationally recognized certification in the field of project management, ICT audit and software architecture is an advantage (example: PRINCE2, PMP, CISA, TOGAF).

2. System Architect

University degree in Engineering, ICT, or another relevant field, with the following experience:

- At least 5 years experience in designing and conceptualizing software solutions and documenting business processes;
- Experience in a similar position in at least 3 (three) similar projects for development of information systems design and application of ICT standards and initiatives, applicable to the government sector of the Republic of Moldova;
- Knowledge of the software life cycle and certification in software architecture and business analysis processes (example: TOGAF 9, CTA, CISA, CBAP, AAC, etc.) will be a significant advantage;
- Experience in the development of IT application with GIS's component would be a strong advantage
- Ability to communicate in Romanian or Russian language.

3. Senior Developer.

University degree in Engineering, ICT, or another relevant field, with the following experience:

- At least 5 years work experience in the mentioned position;
- Participation in the given position in the implementation of at least 3 similar project (explicitly indicated in the submitted CV);
- Recognized experience / certification related to the technological stack proposed for IS „EVF”;
- Experience in the development of IT application with GIS's component would be a strong advantage
- Ability to communicate in Romanian or Russian language.

4. Tester.

University degree in Engineering, ICT or another relevant field, with the following experience:

- Experience in a similar position in at least 2 (two) similar projects (explicitly indicated in the submitted CV);
- Recognized certification in the field (example: ISTQB) will be an essential advantage.
- Ability to communicate in Romanian or Russian language

5. Designer.

University degree in Design or another relevant field with the following experience:

- At least 2 (two) years of experience in the proposed position. Experience demonstrated through the portfolio of works executed;
- Demonstrated development skill in UI /UX design;

- Ability to communicate in Romanian or Russian language.