

Section 5. Terms of Reference

Development of the e-Day software system

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Terms and abbreviations

This section lists and defines the terms and abbreviations used in this document.

Term / abbreviation	Meaning
BESV	Electoral Bureau of Voting Section (from Romanian language)
CEC	Central Electoral Commission
CECE	Council of Electoral Circumscription (from Romanian language)
DBMS	Database Management System
EDMITE	Enhancing democracy in Moldova through inclusive and transparent elections
FR	Functional Requirement
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
HTTPS	Secure HTTP
IDNP	National personal identification number
I	Informative (used to highlight Informative sections/requirements)
ID	Identity
IIS	Internet Information Services - a Web server from Microsoft.
IS	Information System
JPEG	Joint Photographic Experts Group - commonly used method of compression for digital images
M	Mandatory (used to highlight mandatory sections/requirements)
MCloud	Moldova e-Government Cloud solution
MLog	Moldova e-Government platform journaling and audit service
MNotify	Moldova e-Government platform notification service
MPass	Moldova e-Government platform identity and authentication service, mpass.gov.md
MSign	Moldova e-Government electronic signatures service, msign.gov.md
NCPDP	National Center for Personal Data Protection of Moldova
NFR	Non-functional requirement

O	Optional (used to mark Optional requirements)
OS	Operating system
OWASP	Open Web Application Security Project®, owasp.org
PDF	Portable Document Format
SAISE	State Automated Information System "Elections"
SDLC	Software Development Lifecycle
SQL	Structured Query Language
SRD	Software requirements document (description)
TOR	Terms of Reference
UC	Use Case
UI	User Interface, mostly the Web based User Interface
USB	Universal Serial Bus
VPN	Virtual Private Network
XSS	Cross Site Scripting

1. Introduction

1.1 Background

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

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

The current version of SAISE contains around 13 inter-related IT applications/modules meant to ensure transparency, accuracy and trust in the electoral process. Most of the SAISE modules have been designed and developed, under the leadership of the Central Electoral Commission (CEC) and with the previous support of UNDP, during 2014 – 2017. In its current phase (2020 – 2023), the Project shall continue its strategic support to the CEC for further modernizing its IT governance and electoral administration, leading to a complete IT architecture, sustainable across all electoral cycles. Adhering to the CEC Strategic Development Plan for 2020 – 2023 and the SAISE Development Roadmap, the Project shall focus its interventions on the conceptualization, piloting and implementation of IT solutions for increased SAISE cybersecurity, automation of polling stations’ activity and development of an electoral data warehouse as a hub for transparency in elections.

In 2021 the Project committed a comprehensive audit of the SAISE. Based on the audit conclusions, a detailed ICT transformation plan was developed. A key priority of the new SAISE concept is its sustainability and technical readiness for the envisioned modernization and automation of electoral processes. The elaborated Transformation Plan/Roadmap underlines the necessity to focus on the following future changes: 1) Improve the use of the electronic documents; 2) Automatization of the territorial electoral bodies and consequentially digitalization of the workflows related to the circulation of electoral materials; 3) Enabling of services for the contestants (digitalization of the workflow and enable self-services for submitting documents and checking status); 4) Digitalization of the records keeping on seats/mandates; 5) Enabling Voter’s personal office (voter’s access to a broad range of information Ex.info about oneself); 6) Enhancing overall cyber security of the system others.

1.2 Objective and Expected Outputs

The e-Day Module facilitates processes during the election day and assists with voter ballot receipts, voter participation and preliminary statistics about an election cycle within specific circumscriptions or at national level. The e-Day Module is initialized and prepared for operation within SAISE.

With that being said, the project intends to contract an experienced IT systems development Company (hereinafter “the Consultant”) to support the Central Electoral Commission (the Beneficiary) in the development and implementation of the e-Day 2.0 software enhancements as further detailed in the specifications included in this Terms of Reference. Thus, the following results shall be provided by the engaged company within the current assignment:

- Fully functional framework with all functionalities developed and deployed according to the requirements defined in this Term of Reference. The company shall deliver compilable and documented source code (including third-party tools and libraries, licenses, where applicable and automation scripts).
- Technical and End-user documentation developed according to the Client’s documentation requirements defined in this Term of Reference.
- Training sessions and training materials developed according to the Client’s training requirements defined in this Term of Reference.

This Software Requirements Document (SRD) in question presents a list of enhancements to be introduced to the e-Day system already operational within the CEC. The document refers to the system with these enhancements as "e-Day 2.0".

The updates will focus on the automation of the following:

- electoral processes at the level of polling stations including but not limited to:
- developing electronic electoral lists and excluding paper-based lists;
- developing electronic report of the polling stations;
- necessary adjustments related to cybersecurity of the Module functioning and related processes.

The driving factors for e-Day 2.0 enhancements are:

1. the very high workload in the voting section¹ during election day especially in voting section in foreign countries where voting section workers have to manually write down each voter's identity data before they are offered to sign on paper regarding their receipt of the voting ballot.
2. the long time and costs for delivering paper documents from voting sections and territorial circumscriptions. Again, these are much worse for voting sections in foreign countries.
3. the proven practice of electronic documents use in Moldova.

¹ The term "voting section" instead of "polling station" is used throughout this document since it more closely matches a direct translation from Romanian and will be better understood by local stakeholders.

e-Day 2.0 capabilities will:

- first pilot digital processes for a subset of voting sections and territorial circumscriptions and documents during the election day.
- based on piloting outcomes e-Day 2.0 will be used in local elections (where only a few electoral circumscriptions are involved).
- afterwards, e-Day 2.0 will be possible to use during subsequent general elections. CEC will decide on its full roll-out depending on confidence and readiness of local electoral organizations in the use of electronic tools.

Of note is that as envisioned, e-Day 2.0 will be based on a mixture of digital and paper-based processes and documents. In case the digital option does not succeed in a voting section or circumscription the electoral organization will fall back on paper-based processes during the election day.

1.3 Legal and normative context

e-Day 2.0 development and operation shall comply with:

1. Statute no. 1381 of 21-11-1997 (Electoral code);
2. CEC Regulation no. 137 of 14 Feb 2006 regarding Central Electoral Commission (CEC) activity;
3. CEC Regulation no. 1734 of 3 July 2018 regarding activity of Electoral Bureau of Voting Sections (BESV);
4. CEC Regulation no. 1702 of 19 July 2018 regarding activity of Electoral Circumscription Councils (CECE);
5. CEC Regulation regarding Observer statute and observer accreditation procedure no. 332 of 24 Oct 2006;
6. Law no. 101/2008 regarding approval of Concept of State Automated Informational System "Elections" (SAISE);
7. Law no. 982/2000 regarding access to information;
8. Law no. 133/2011 regarding personal data protection;
9. Law no. 142/2018 regarding data exchange and interoperability;
10. Government Decision. 1123/2010 on Requirements for securing personal data during their processing by informational systems;
11. Government Decision no. 201/2017 on Minimal mandatory requirements of cybernetics security;
12. Republic of Moldova standard SMV ISO CEI 15288:2009, "Systems and software engineering. System life-cycle processes";
13. Technical Regulation "Software life-cycle processes" RT 38370656-002:2006.

Since most of the focus of this document covers election day functions at CECE and BESV levels especial consideration shall be given to BESV and CECE regulations mentioned above. Of note is that these regulations are authored and implemented by CEC and as such adjustments to them can be made in order to enable e-Day 2.0 facilities be integrated into electoral processes.

Besides the public references above CEC internally is guided by an integral SAISE vision of the CEC.

2. e-Day 2.0 architecture

This section presents the high-level system architecture. It will:

- preserve the proven e-Day 1.0 functions and capabilities
- extend the e-Day 2.0 capabilities with a series of election day electoral records including their PDF representation.
- enable the capture of voter signatures as images to avoid time consuming manual voter registration
- extend the CEC administrative console of e-Day with functionality to configure opening hours of voting sections and to review statistics and actual electoral records submitted by other users.

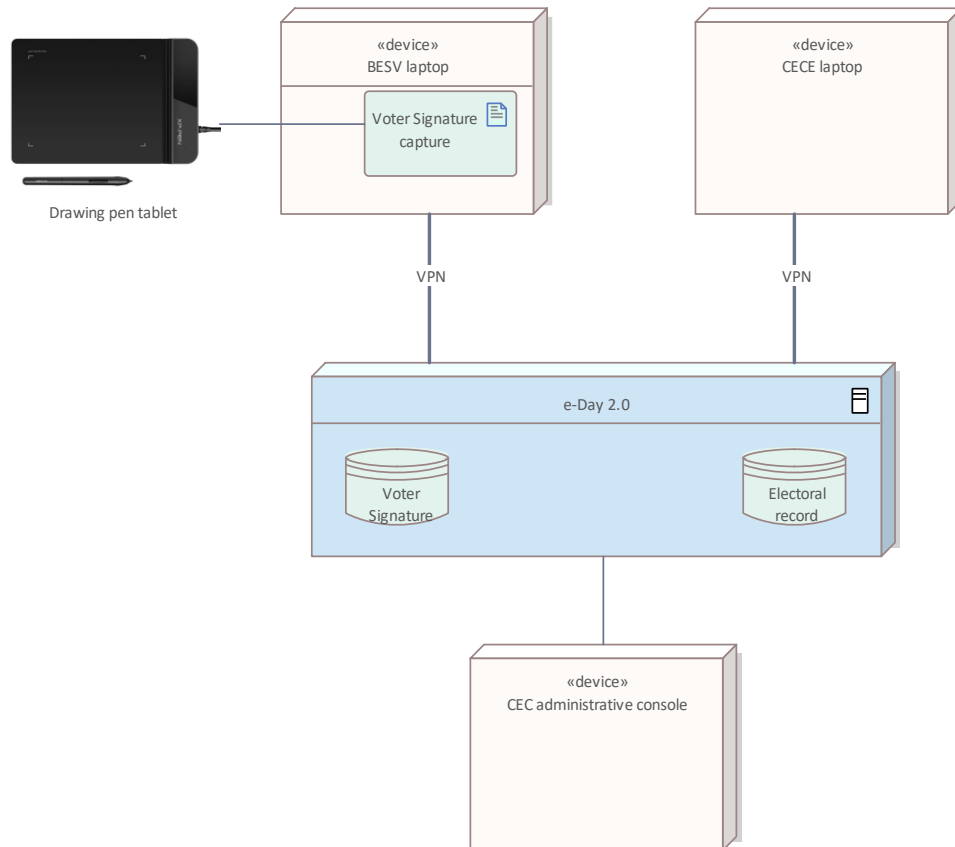


Figure 1: e-Day 2.0 architecture

e-Day 2.0

e-Day uses a high-availability/load-balanced configuration with replicated:

- web server
- application server
- mirrored database

Technologically e-Day uses:

- operating system: Microsoft Windows Server
- web layer: IIS (version provided by OS)
- app layer: .Net framework version 4.x
- DBMS: Microsoft SQL Server

«server»

Servers are virtualized and run in MCloud. Client connections are over secure VPN.

More details will be made available to the selected vendor.

Drawing pen tablet

The signature capture device represents a:

- Plug'n'Play USB driverless device that works on Windows and Linux
- 4 x 3 inch Drawing Pen Digital Tablet
- Battery-free stylus does not require charging

For example, XP-PEN G430S & PN01 Battery-Free Stylus.

Important: This is a sketch tablet using the stylus to draw on the computer screen. This should not be confused with a tablet running iOS or Android with a sensor in its display.

3. Use Cases

Use Cases are the mechanism of meaningfully presenting requirements regarding system services, functions and use. Actors represent roles and external systems that the system interacts with.

For context the section starts with

- Actors that depict the human users but also other systems that interact with this platform
- Information objects that depict the important informational items that the system operates with.
- Use Cases that depict how users and other systems interact in a scenario in order to achieve a stated outcome.

Use cases are grouped in a few general groups and packaged below as follows:

- voting section functions
- circumscription functions
- administrative functions carried out at CEC level

3.1 Actors

Actors section depicts different end user roles interacting with the system but also other systems it integrates with. Generalization links between actors highlight roles that are mostly of the same type with some notable exception in the context of this system.

The diagram below highlights the Human actors, the third party systems to integrate with but also the system itself and systems listed for context.

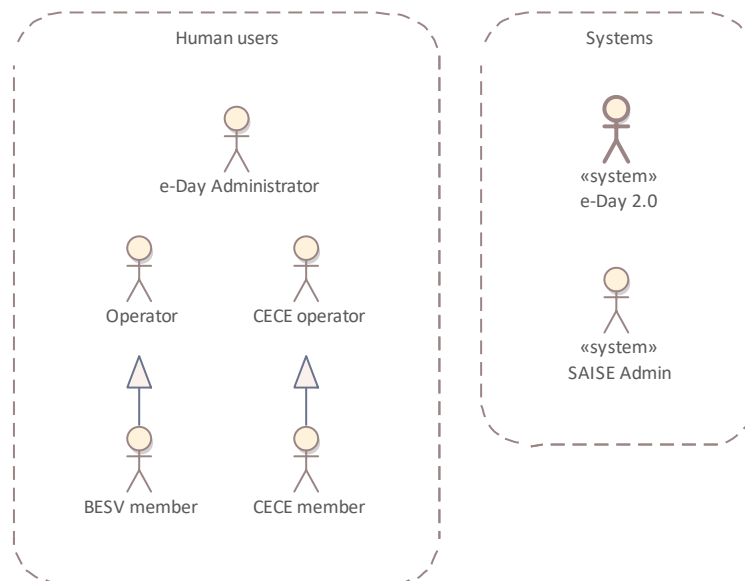


Figure 2: Actors

BESV member

BESV is a team and most of its actions and decisions are deliberative. While an appointed member of the team will prepare the decision and examine the supporting documents most of the outcomes are approved by BESV President and Secretary or all the members.

BESV members delegate one member or somebody more knowledgeable to represent the BESV as an Operator of e-Day.

CECE member

CECE is a team and most of its actions and decisions are deliberative. While an appointed member of the team will prepare the decision and examine the supporting documents most of the outcomes are approved by CECE President and Secretary or all the members.

CECE members delegate one member or somebody computer savvy to represent the CECE as an Operator of e-Day.

CECE operator

Operators are appointed users of e-Day. They represent a CECE.

Operators can be one of the Members of the electoral organization they represent or somebody computer savvy appointed by it.

Operator credentials (designated user names and passwords) are managed in SAISE Admin. These credentials are pre-populated in the e-Day database when the system is being readied for elections.

e-Day Administrator

CEC representative appointed by CEC to carry out configuration and initial setup of system data and permissions.

Operator

Operators are appointed users of e-Day. They represent a BESV.

Operators can be one of the Members of the electoral organization they represent or somebody computer savvy appointed by it.

Operator credentials (designated user names and passwords) are managed in SAISE Admin. These credentials are pre-populated in the e-Day database when the system is being readied for elections.

e-Day 2.0

«system»

This system - e-Day 2.0.

This actor is used to facilitate/streamline the context/requirements within a Use Case.

SAISE Admin

«system»

Existing SAISE Admin system used to plan and prepare elections of all types.

3.2 Information objects

This section depicts the main information objects that the system operates with and their relationships. The dark red elements depict informational objects that will be added by this project while the remaining ones already exist (but might require refinements).

Details of each informational object and further relationships will be clarified during system development.

Important: The diagram depicts the relationships and key attributes of the informational objects. These are not explicitly listed in the text but vendors shall account for them in their solutions and estimates. CEC can provide details of relationships and key attributes shown on the diagram on request.

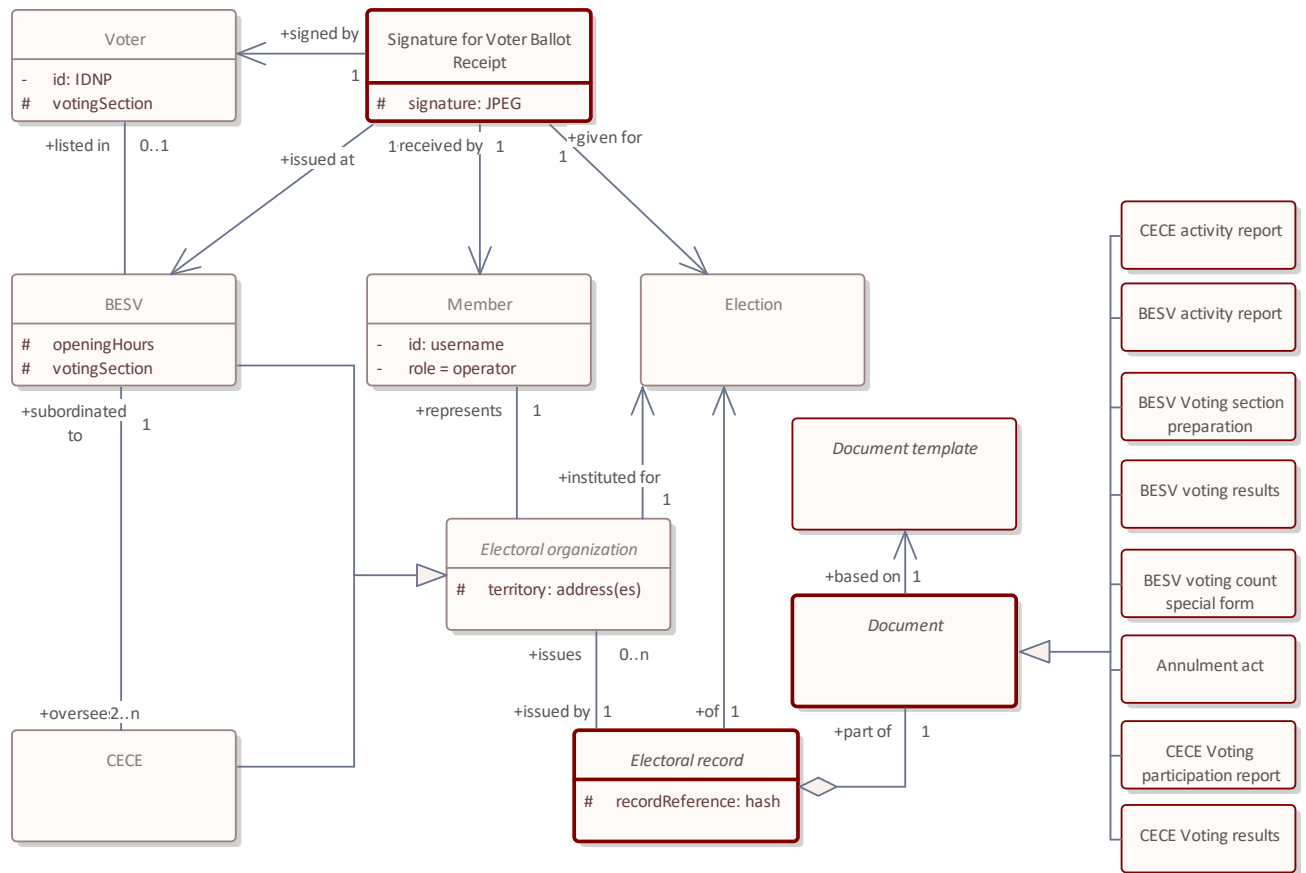


Figure 3: Information objects

Signature for Voter Ballot Receipt

Electronically captured (picture) of the voter signature regarding their confirmation of receipt of a voting ballot for this election.

Electoral record

A specific type of electoral record compatible with the electoral process/activity carried out by an electoral organization (CECE or BESV) and also the electronic document it produces.

Document

Document at this time are visual PDF representation of electoral records. This enables capture of the document content, its signature but also displays uniformly across many devices and applications. Documents in this format are ready to be electronically signed as supported by MSign (and once signed they become legally binding replacements for paper variants).

Document template

Document templates follow closely the paper based document formats as defined by CEC and referenced by the corresponding CECE and BESV regulations.

All types of documents have their specific document template. Templates can be adjusted and all future documents based on the template will implement the new format. Existing draft and final documents are not affected by document template changes.

Electoral organization

The generic depiction of electoral organizations such as BESV, local and regional CECE but also CEC.

BESV

Electoral Bureau of a Voting Section (acronym in Romanian).

This is an electoral organization that works within one voting section jurisdiction.

BESV are instituted during elections by CECE in territories that require multiple voting sections. When a territory has a single voting section the CECE itself carries out BESV responsibilities too.

CECE

CECE depicts a record regarding an individual regional CECE.

Each of the CECE has a number of members and oversees a number of BESV.

Annulment act

Annulment act for unused temporary voting certificates

BESV activity report

BESV activity report issued by a voting section at the end of its mandate - usually on the night/day immediately after election day.

Its electronic structure and template will be coordinated with CEC during development.

BESV voting count special form

BESV voting counts special form

BESV voting results

BESV voting results meeting minutes

BESV Voting section preparation

Meeting minutes regarding voting section preparation

CECE activity report

CECE report is produced by CECE at the end of its mandate.

The electronic structure and template will be coordinated with CEC during development.

CECE Voting participation report

Voting participation report aggregated at CECE level (from data of subordinated BESV).

CECE Voting results

Voting results meeting minutes at CECE level aggregated data from subordinated BESV.

Election

Any of the local or general elections or referenda.

It should be noted that multiple elections can take place in an election day - local council(s), mayors, parliament etc. This diagram does not reflect this detail.

Member

CECE and BESV members are appointed by the regional or local CECE accordingly. Initially the system is configured with authorized operators who represent a BESV/CECE.

Voter

Voter represents a particular eligible voter for this election cycle. Voters and the list assignments to voting sections are already present in e-Day, including the checks whether the voter is allowed to vote at a specific voting section/BESV.

3.3 Voting section

This section depicts the e-Day 2.0 functionality targeting the BESV (i.e. voting section processes). Operators are assigned by BESV and given the credentials for the system.

UC100: e-Day 1.0 BESV functionality

«informative»

This Use Case designates the existing functionality of e-Day - depicted as "e-Day 1.0".

Note that ALL the e-Day 2.0 scope Use Cases extend the existing e-Day 1.0 functionality.

UC101: Voting section preparation meeting minutes

At the start of the voting day BESV drafts and submits meeting minutes regarding Voting section preparation.

The paper format of meeting minutes of Voting section preparation is provided in BESV Regulation annex 9.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa%209_%20BESV_procesul-verbal%20privind%20preg%C4%83tirea%20sec%C5%A3iei%20de%20votare.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

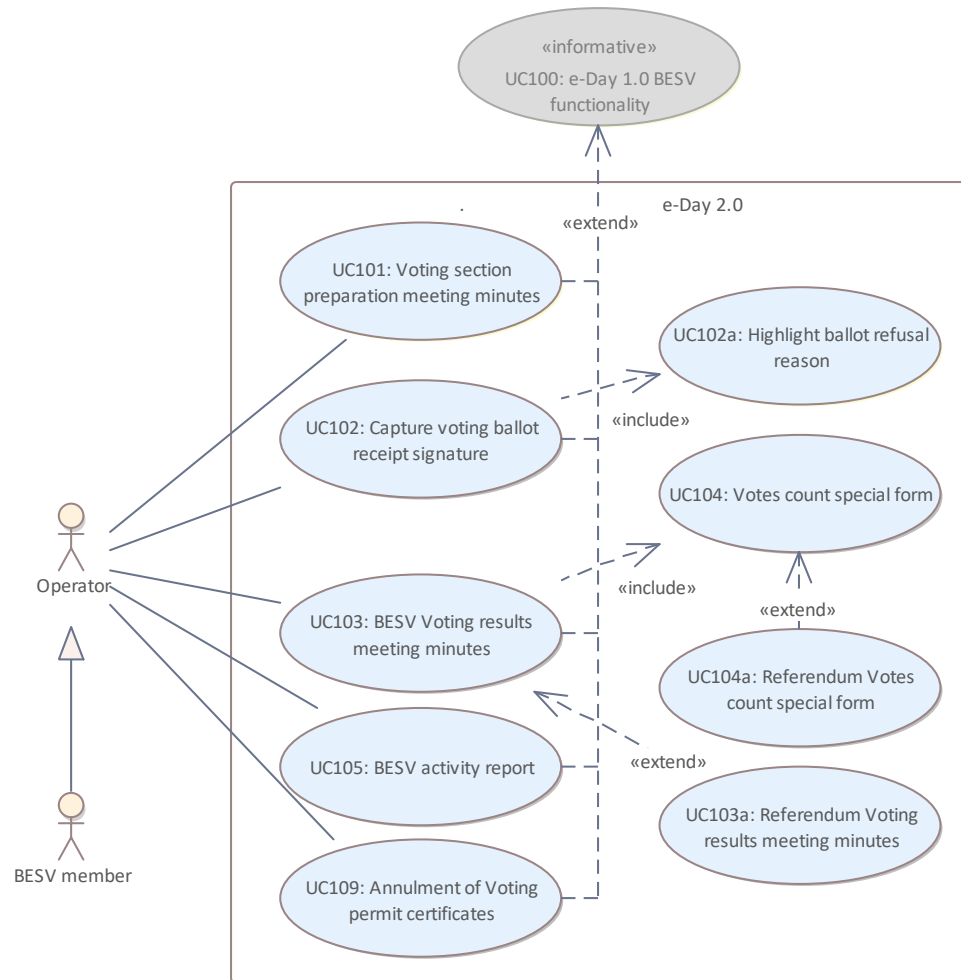


Figure 4: Voting section

Constraints

- User represents a BESV
- Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to Voting section preparation
2	System presents Voting section preparation form and pre-populates it with election, BESV data <i>Alternate 2a: Draft of electoral record available continues at 2</i> <i>Alternate 2b: Electoral record is complete continues at 7</i>
3	User, following voting section preparation steps adds the corresponding information to the form
4	System highlights progress made according to mandatory data fields required in the meeting minutes
5	User submits form as complete <i>Alternate 5a: User persists draft of electoral record continues at 5</i>

6	System validates mandatory data has been provided and is valid.. System integrates provided data in the document template and prepares also the PDF version of the document.
7	System previews the PDF resulting document to user
8	User reviews the document and confirms <i>Alternate 8a: Draft electoral record has errors continues at 3</i>
9	System persists the submitted record and the PDF copy. System marks the electoral record as final.
10	System logs event
11	System informs user of result

Draft of electoral record available

Step	Action
1	System populates the form with previously persisted draft values
2	/continue at step 2 of basic path/

User persists draft of electoral record

Step	Action
1	System validates provided data to be correct. Note that at this stage some mandatory values might still be missing.
2	System persists draft record
3	System logs event
4	/continue with step 5 of basic path/

Electoral record is complete

Step	Action
1	/continue to step 7 of basic path/

Draft electoral record has errors

Step	Action
1	User rejects data due to errors
2	System gets user confirmation to reject the document. System discards PDF document and marks the record as draft
3	/continue with step 3 of basic path/

UC102: Capture voting ballot receipt signature

BESV captures voter signatures for receipt of voting ballot.

Current processes are work intensive and time consuming, especially in voting sections in foreign countries where besides checking voter ballot records the BESV personnel manually list the voter in paper extended voter lists and request voters paper signature.

The current use case enables capture of signatures using a pen and sketch pad device that produces an image of the signature persisted in the system.

Constraints

- Election is open (running)
- User represents a BESV

Basic Path

Step	Action
1	User navigates to (existing) voter validation function of e-Day
2	System presents a clear and ready voter identity capture form. System sets focus in IDNP field
3	User scans/captures voter personal identifier (IDNP) from their identity document (ID card or passport)
4	System validates IDNP is accurate and checks its voter lists <i>Alternate 4a: Voter IDNP invalid or not on voter lists continues at 3</i>
5	System "green-lights" voter as allowed to be issued a ballot <i>Alternate 5a: Voter "red-lighted" as NOT allowed to receive a ballot continues at End</i> <i>Alternate 5b: Voter already received a ballot continues at End</i>
6	System enables voter signature capture to authorize (paper) voter ballot release
7	User checks voter is green-lighted and instructs voter to use electronic pen and sign on the attached sketch-pad
8	Voter provides their signature using electronic pen and sketchpad
9	User visually matches provided signature with identity card/document signature, confirms in e-Day signature captured and issues Voter a (paper) voter ballot
10	System captures signature confirmation, persist voter ballot release event (including date/time, voting section and user) and also persists the captured signature
11	System notifies user that voting ballot receipt signature has been persisted in the system
12	User acknowledges and continues at step 2 of basic path (above)

Voter IDNP invalid or not on voter lists

Step	Action
1	System notifies user that "Voter ID is bad or not allowed to vote in this election"
2	User reviews the notification informs the voter and checks if the provided IDNP is accurately captured

Voter already received a ballot

Step	Action
1	System notifies user that Voter has been issued a voter ballot at what date/time and what voting section
2	User reviews system alert, reviews IDNP accuracy and if accurate considers notifying BESV president regarding the issue
3	User resumes processing other voters in queue after issue sorted
4	/continue with step 2 of basic path/

Voter "red-lighted" as NOT allowed to receive a ballot

Step	Action
1	<include> UC102a: Highlight ballot refusal reason

UC102a: Highlight ballot refusal reason

When a ballot cannot be released to a voter e-Day 1.0 presents a generic message.

As part of the voting ballot receipt process this is enhanced to include a clarification what is the reason to refuse the release of a ballot to a person with provided IDNP.

For example, the following reasons can be considered:

- not a local voter - for local elections when the voter is not on the local CECE/BESV voter list
- already voted - when a ballot has been released to this voter in a BESV.
- voting rights removed - when there is a judicial decision which prohibits the person to vote that applies in current election cycle
- deceased - when identifier is allocated to a person declared to be deceased
- too young - when IDNP belongs to a person not old enough to participate in this elections
- etc.

The full list of possible reasons, their codes and the messages to display will be coordinated with CEC during development.

UC103: BESV Voting results meeting minutes

Once all votes are counted BESV prepares meeting minutes of Votes results.

The paper format of the document is given in BESV Regulation annex 12.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa%2012%20_BESV%20si%20Anexa%2012a%20BESV%20_model%20PV%20birou%20final.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- User represents a BESV
- Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to Voting results
2	System prepares Voting results form based on form template, election and electoral competitors. System prepopulates the form with election and BESV specific data. <i>Alternate 2a: BESV voting results ready continues at 7</i> <i>Alternate 2b: BESV voting results draft continues at 2</i>
3	User provides voting count values and additional form information
4	System performs voting count checks and highlights remaining votes or discrepancies
5	User confirms voting count numbers <i>Alternate 5a: User saves draft continues at 2</i>
6	System validates that all cross-checks for voting count fields are ok. System integrates the numbers in a voting result PDF document according to template.
7	System prompts user to review voting results form and resulting PDF

8	User reviews content of voting results form and its PDF representation and confirms accuracy <i>Alternate 8a: Draft BESV voting results errors continues at 3</i>
9	System persist voting results record and its PDF document. System marks electoral record as final.
10	System journals persisted results into its logs
11	System informs user of results

BESV voting results ready

Step	Action
1	/continue with step 7 of basic path/

BESV voting results draft

Step	Action
1	System retrieves draft voting results data and populates the form
2	/continue with step 2 of basic path/

Draft BESV voting results errors

Step	Action
1	User detects errors in voting results and rejects the electoral record
2	System discards PDF document of the record and marks it as draft
3	/continue at step 3 of basic path/

User saves draft

Step	Action
1	User saves incomplete form (to prevent data loss)
2	System validates that provided data is ok and persists the record as draft. Note that at this stage some mandatory values might be missing and saving the form should be possible even with incomplete data.
3	/continue with step 3 of basic path/

UC103a: Referendum Voting results meeting minutes

Votes results meeting minutes has some small differences for Referenda and they shall be accounted under UC103. Depending on election type either UC103 or UC103a shall be used.

The paper format of the document is given in BESV Regulation annex 12a.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa%2012%20_BESV%20si%20Anexa%2012a%20BESV%20_model%20PV%20birou%20final.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

UC104: Votes count special form

Once valid votes are counted a special Votes count form is prepared. The form can be signed by representatives of election competitors.

The paper format of the document is given in BESV Regulation annex 10.

Refer:

[https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special\(1\).docx](https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special(1).docx)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- User represents a BESV

Basic Path

Step	Action
1	User navigates to votes count special form
2	System validates that voting results record exist. System populates votes count special form with values from voting results record. System integrates relevant values in the PDF document. <i>Alternate 2a: Voting results record does not exist continues at End</i>
3	System presents votes count special form and PDF document for review
4	User reviews votes count special form

Voting results record does not exist

Step	Action
1	System notifies user of missing voting results.

UC104a: Referendum Votes count special form

Special Votes count form has some small differences for Referenda and they shall be accounted under UC104. Depending on election type either UC104 or UC104a is used.

The paper format of the document is given in BESV Regulation annex 11.

Refer:

[https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special\(1\).docx](https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special(1).docx)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

UC105: BESV activity report

Once BESV ends activity (usually late in the day of the election or on the next day) it prepares and submits a final report.

The paper format of the document is given in BESV Regulation annex 13.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa%2013_BESV_raportul%20biroului%20electoral%20al%20sec%C5%A3iei%20de%20votare.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- User represents a BESV
- Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to BESV activity report
2	System presents the list of fields to be added to the BESV activity report. System pre-populates the values regarding election and electoral organization, including the required member signature details (president, secretary, executor, members) <i>Alternate 2a: BESV activity report ready continues at 7</i> <i>Alternate 2b: BESV activity report draft exists continues at 2</i>
3	User provides BESV activity report values as available
4	System highlights progress made (by number of mandatory fields already provided)
5	User submits the report as complete <i>Alternate 5a: User saves draft continues at 3</i>
6	System validates the provided data, that all mandatory fields are captured and fills all the values in the BESV activity report template
7	System previews the resulting PDF document to the user
8	User reviews PDF document and confirms it <i>Alternate 8a: Draft BESV activity report errors continues at 3</i>
9	System persists report record and document
10	System logs BESV activity report
11	System informs user of result

BESV activity report ready

Step	Action
1	/continue with step 7 of basic path/

BESV activity report draft exists

Step	Action
1	System populates BESV activity report form with prior draft values
2	/continue with Basic path/

Draft BESV activity report errors

Step	Action
1	User rejects document and returns it back to draft status

2	System discards document and reverts BESV activity report (form) to draft status
3	/return to step 3 of basic path/

User saves draft

Step	Action
1	User submits incomplete data as a draft
2	System validates provided data and persists the incomplete electoral record. Note that at this time some of the mandatory values can be missing
3	/continue at step 3 of basic scenario/

UC109: Annulment of Voting permit certificates

At the end of the voting day BESV drafts, signs and submits an Act of annulment of unused voting permit certificates.

The paper format of the document is given in BESV Regulation annex 6.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa%206_BESV_%20Act%20de%20anulare%20a%20certificatelor%20pentru%20drept.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- User represents a BESV
- Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to Act of annulment of unused voting permit certificates
2	System prepopulates the form with election, BESV data.. System offers the user to provide the required data. <i>Alternate 2a: Draft exists continues at 2</i> <i>Alternate 2b: Act of annulment complete continues at 7</i>
3	User provides the required form data
4	System highlights progress made (based on the number of mandatory fields of the form).
5	User confirms the electoral record <i>Alternate 5a: User saves draft continues at 3</i>
6	System validates the mandatory data has been provided and the values conform to requirements. System integrates the data in the PDF template.
7	System previews the resulting PDF document to user
8	User reviews the document and confirms it's accurate <i>Alternate 8a: Draft has errors continues at 3</i>
9	System persists the electoral record, the associated document and marks the record as complete
10	System logs the event
11	System informs user of result

Draft exists

Step	Action
1	System populates the form with persisted draft electoral record
2	/continue with step 2 of basic path/

Act of annulment complete

Step	Action
1	/continue with step 7 of basic path/

User saves draft

Step	Action
1	User saves incomplete form as a draft
2	System validates provided data and persists the incomplete electoral record. Note that at this time some mandatory values might still be missing. The draft record is saved with some mandatory missing data.
3	/continue with step 3 of basic path/

Draft has errors

Step	Action
1	User detects errors in the record and rejects it
2	System gets confirmation from user to reject the record, sets the record as draft and discards the associated PDF document
3	System journals the user action in its logs
4	/continue with step 3 of basic path/

3.4 Circumscription

This section depicts the work carried out at Electoral Council level. Of note is that for larger Electoral Councils (regional) territorial CECE are created with their own members and subordinate BESV. Specially designated CECE operators carry out the assigned CECE work within e-Day 2.0.

UC200: e-Day 1.0 CECE functionality

«informative»

This Use Case designates the existing functionality of e-Day - depicted as "e-Day 1.0".

Note that ALL the e-Day 2.0 scope Use Cases extend the existing e-Day 1.0 functionality.

UC201: CECE Voting participation report

CECE aggregates voting participation count from all its territorial electoral organizations and produces a total count for the CECE.

Results are listed in a Voting participation report. The system also prepares a PDF well structured form of the report available for download by CECE representatives.

Constraints

- 1 User represents a CECE

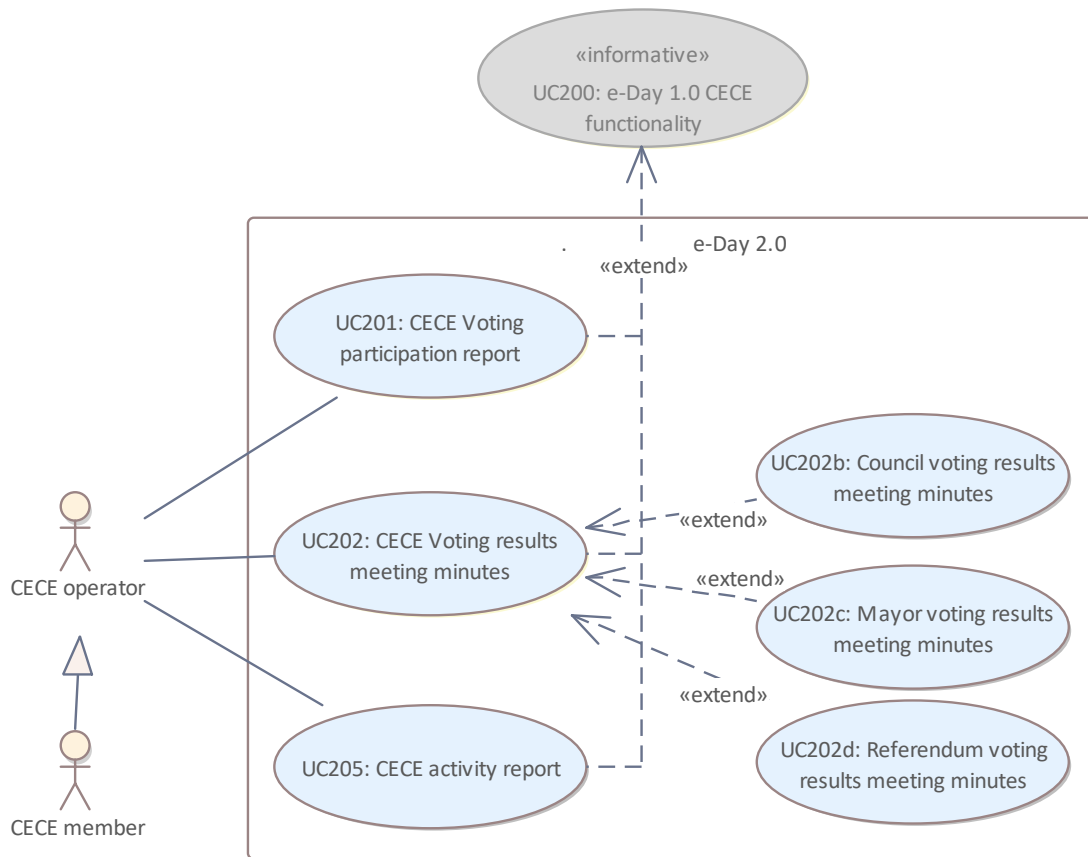


Figure 5: Circumscription

Basic Path

Step	Action
1	User navigates to Voting participation report
2	System aggregates the voting participation counts across all subordinate electoral organizations (either local CECE or BESV)
3	System displays results by its subordinate electoral organization including those without data

UC202: CECE Voting results meeting minutes

CECE aggregates voting results from all its territorial electoral organizations into a total voting count for the CECE.

Results are listed in a Voting results meeting minutes.

The paper format of meeting minutes of Results are given in CECE Regulation annex 14.

Refer:

[https://a.cec.md/storage/ckfinder/files/anexa14_PV_CECE_totalizare_general\(1\).docx](https://a.cec.md/storage/ckfinder/files/anexa14_PV_CECE_totalizare_general(1).docx)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- 2 User represents a CECE

3 Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to Voting results meeting minutes
2	System opens Voting results form and pre-populates it with date/time, election, electoral organization and executor data. System aggregates the data in BESV voting results meeting minutes <i>Alternate 2a: CECE Voting results complete continues at End</i>
3	User reviews and provides the necessary data
4	System updates progress indicator based on how many of the subordinate BESV have already provided their meeting minutes
5	User confirms the voting results for the CECE <i>Alternate 5a: User updates Voting results with fresh data continues at End</i>
6	System validates voting results meeting minutes data includes at least the values from subordinate electoral organizations (BESV or local CECE). System validates meeting minutes data is complete and satisfies the relationships for its fields/values. <i>Alternate 6a: Validation fails continues at 3</i>
7	System prepares the Voting results meeting minutes in PDF form according to its template. System previews the PDF document for final checks by user.
8	User reviews and confirms Voting results meeting minutes <i>Alternate 8a: User cancels Voting results confirmation continues at 3</i>
9	System persists the electoral record and its associated PDF document. System marks the electoral record as final.
10	System logs event

CECE Voting results complete

Step	Action
1	System displays the complete electoral record and its associated PDF document (for download)

Validation fails

Step	Action
1	System notifies user what are the constraints that are not satisfied and highlights the relevant fields on the form.
2	/continue with step 3 of basic path/

User cancels Voting results confirmation

Step	Action
1	/return to step 3 of basic path/

User updates Voting results with fresh data

Step	Action
1	User notices that some subordinate electoral organizations did not submit their voting results meeting minutes and checks if there have been updates
2	/continue with step 1 of basic path/

UC202b: Council voting results meeting minutes

Voting Count meeting minutes for local council members include some differences. This Use Case is intended to cover the differences to main implementation under UC202.

The paper format of meeting minutes of Results are given in CECE Regulation annex 14b.

Refer:

https://a.cec.md/storage/ckfinder/files/Anexa14b_totalizare_ConsiliuLocal.docx

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

UC202c: Mayor voting results meeting minutes

Voting Count meeting minutes for mayors include some differences. This Use Case is intended to cover the differences to main implementation under UC202.

The paper format of meeting minutes of Results are given in CECE Regulation annex 14c.

Refer:

[https://a.cec.md/storage/ckfinder/files/anexa14c_PV_totalizare_primar%20\(2\)\(1\).doc](https://a.cec.md/storage/ckfinder/files/anexa14c_PV_totalizare_primar%20(2)(1).doc)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

UC202d: Referendum voting results meeting minutes

Voting Count meeting minutes for referenda include some differences. This Use Case is intended to cover the differences to main implementation under UC202.

The paper format of meeting minutes of Results are given in CECE Regulation annex 14d.

Refer:

[https://a.cec.md/storage/ckfinder/files/anexa14d_HCECE_PV_totalizare_referendum%20\(1\)\(1\).docx](https://a.cec.md/storage/ckfinder/files/anexa14d_HCECE_PV_totalizare_referendum%20(1)(1).docx)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

UC205: CECE activity report

CECE issues an activity report after votes are counted on the day of the elections.

Important: The report contains both

- **user provided inputs and details and**
- **total counts across similar activity reports submitted by subordinate BESV**

The paper format of meeting minutes of Results is given in CECE Regulation annex 15.

Refer:

[https://a.cec.md/storage/ckfinder/files/anexa15_RaportCECE\(1\).docx](https://a.cec.md/storage/ckfinder/files/anexa15_RaportCECE(1).docx)

Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).

Constraints

- 4 User represents a CECE
- 5 Complete electoral record cannot be changed

Basic Path

Step	Action
1	User navigates to CECE activity report
2	System opens CECE activity report form and pre-populates it with date/time, election, electoral organization and executor data. System aggregates the data in BESV activity reports for the designated fields. <i>Alternate 2a: CECE activity report is ready continues at 8</i> <i>Alternate 2b: CECE activity report draft continues at 2</i>
3	User provides the available data
4	System updates progress indicator based on how many of the subordinate BESV have already provided their reports
5	User confirms the CECE activity report <i>Alternate 5a: User saves draft continues at 3</i>
6	System validates that the required data has been provided and is of adequate quality. <i>Alternate 6a: Some BESV activity reports unavailable continues at 7</i>
7	System prepares a CECE activity report document based on its template and fills in all the provided user data. System persists the document as a PDF and previews it to the user.
8	User reviews PDF document and confirms it <i>Alternate 8a: CECE activity report errors continues at 2</i>
9	System persists CECE activity report and its PDF document. System marks the electoral record as final.
10	System logs CECE activity report submission

CECE activity report is ready

Step	Action
1	/continue with step 8 of basic path/

CECE activity report errors

Step	Action
1	President rejects content of CECE activity report as currently compiled
2	System gets confirmation from president that document is discarded and removes the document including its signatures. System marks CECE activity report form as draft and re-enables its modification
3	/continue at step 2 of basic path/

CECE activity report draft

Step	Action
1	System populates the CECE activity report draft with previously persisted data
2	/continue at step 2 of basic path/

User saves draft

Step	Action
1	User saves the electoral record as a draft
2	System validates provided data values and persists the incomplete electoral record as a draft. Note that at this stage some mandatory values might still be missing. The system saves the draft anyway.
3	/continue at step 3 of basic path/

Some BESV activity reports unavailable

Step	Action
1	System determines that some subordinate BESV activity reports have not been submitted and prompts user to review and correct the potentially incomplete values
2	System enables for edit the calculated values of the CECE activity report (prepopulated with the calculated values)
3	User adjusts the incomplete values and submits
4	/continue with step 7 of basic path/

3.5 CEC

This section depicts preparatory work that clearly sets the election and the jurisdictions where it will take place.

Jurisdictions are given in the form of CECE/BESV and their operators who are authorized to use the system.

UC501: Prepare election

«informative»

Election preparations are made by CEC and its representatives collect all the required data in SAISE Admin.

When all election preparations are ready the e-Day database is initialized with all the required election data and authorizations.

This Use Case is listed for informational purposes.

UC502: Initialize e-Day database and data

e-Day database initialization is already implemented. Further refinements shall be applied to this process to ensure e-Day 2.0 capabilities are fully supported.

Generally, e-Day database initialization is triggered by a CEC representative and is carried out by/via SAISE Admin stored procedures and/or scripts.

Details how e-Day database initialization works will be provided during development.

UC505: Review e-Day data and statistics

e-Day is extended to allow CEC representatives monitor statistics regarding e-Day operation and also to enable them to drill-down into individual electoral organization views to review its individual electoral records.

The statistics will include at least:

- count of electronically captured signatures for election by BESV/CECE at 15 minute intervals
- count of electoral records captured for election by document type/BESV/CECE

Filtering criteria will also be used. Exact details will be discussed and approved during development.

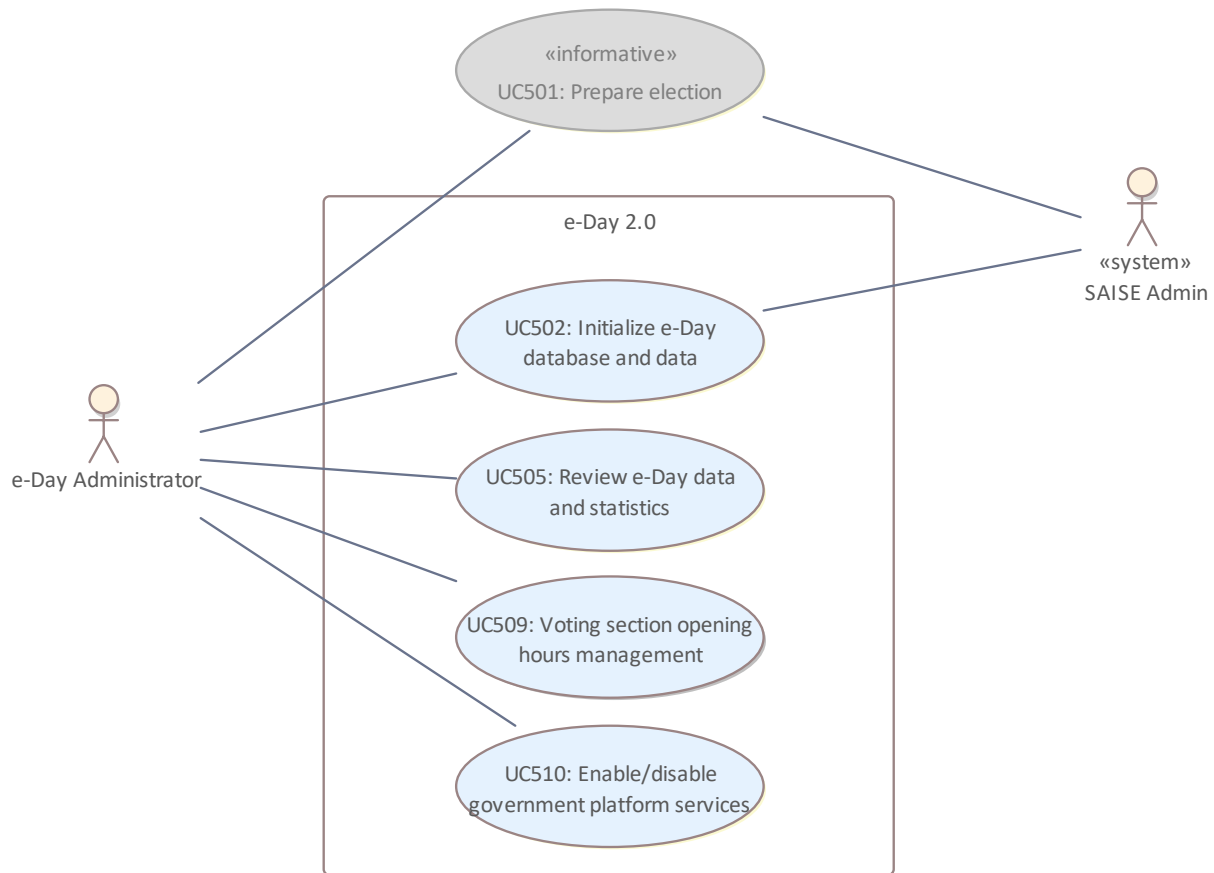


Figure 6: CEC

UC509: Voting section opening hours management

Most voting sections are opened in Moldova and operate in a single time-zone. For general elections voting sections abroad work in different time zones.

At this time e-Day 1.0 offers the ability for administrative personnel to set a voting section as opened or closed. But this requires significant workloads as specific hours of the election day.

Instead, this can be anticipated by setting the opening and closing hours of each voting section in advance. Only voting sections that require additional time due to voter queues will get the extension.

Overall, the functionality shall

- set the default election day opening hours across all voting sections (default 7.00 to 21.00)
- allow the administrator ability to mark voting sections outside Moldova and appoint them to a specific time zone (+/- X hours)
- enforce voting section open hours based on these settings
- allow administrators to "close" a voting sections disregarding its opening hours settings (this allows to reflect the suspended voting in some voting sections where needed)
- allow administrators to set an extended open/close time (compared to other voting sections) and thus enable extending the opened time for voting section with long voter queues

Important: e-Day 1.0 already includes functionality to set open/close time of a voting section. Under this UC509 enhancements are applied where opening and closing hours setting reduces the workload and possibility of errors during the election day. This is achieved by configuring most of these values (carefully) in advance and only making changes to suspend voting or to extend voting hours for a few voting sections where it is needed.

UC510: Enable/disable government platform services

e-Day integrates services from government platform:

- MPass
- MLog
- MNotify etc.

Depending on configuration and size of the election these facilities are enabled or disabled. In e-Day 1.0 this is achieved by manually tweaking the applications themselves.

The enhancement will add options to turn on/off these services individually. Vendor will coordinate with CEC how this is achieved.

Constraints

- 6 User is an e-Day Administrator

4. Requirements

This section details the functional and non-functional requirements for the system.

4.1 Functional Requirements

Functional requirements supplement the use cases with details regarding how a specific (business) function is carried out or is constrained by the system. Functional requirements are grouped similar to use cases.

Voting section functional requirements

This section lists detailed functional requirements regarding BESV functionality and constraints.

ID	Requirement	Mandatory or Optional
FR101	BESV regulation BESV regulation governs work, processes and deliverables at voting section level. Refer BESV regulation: http://a.cec.md/storage/ckfinder/files/Regulament%20_BESV(1).pdf The regulation references the templates BESV has to comply with when producing its official records/documents.	M
FR102	Election open time Elections start at 7:00 (local time). Open time is configurable to account for BESV timezone.	M
FR103	Election close time Elections close at 21:00 (local time). Close time is configurable to account for BESV timezone.	M
FR104	Extended close time Close time can be extended by up to 2 hours to allow queued voters finish voting at voting sections with high participation.	M
FR105	Voting temporary suspended Due to issues and incidents voting at some sections can be temporarily suspended. Presidents of BESV announce voting section closure to CEC (and the public) and e-Day administrative personnel apply this in the system.	M
FR106	After election day end e-Day external access is forbidden	M
FR107	Voting ballot issued only if e-Day checks allow it Voter identity is used to verify in e-Day that voter is allowed to vote at the voting section. If the check fails or returns a refusal reason a voting ballot is not issued to the voter.	M
FR108	Voter signs receipt of a voting ballot Voter is issued a voting ballot after they sign a receipt.	M

ID	Requirement	Mandatory or Optional
FR109	<p>Voter ballot receipt signature details</p> <p>Voter ballot receipt signature persists:</p> <ul style="list-style-type: none"> • election day • BESV identifier • BESV operator/member • universal date/time when e-Day check has been performed • identifier of election(s) on the election day • voter IDNP • voter signature (if captured electronically) <p>Note: The above mainly follows the data available in e-Day 1.0</p>	M
FR110	<p>Voter ballot receipt conditions</p> <p>Voter ballot receipt conditions are different at voting sections in Transnistria and foreign countries.</p>	M
FR111	<p>Votes counting starts after election close time</p> <p>Before election close time all the votes are secret and for example Voting results documents cannot be drafted with meaningful values.</p>	M
FR112	<p>Voting results and activity report are prepared during BESV voting counting session</p> <p>Immediately after election close BESV starts a voting counting session during which both BESV voting results and BESV activity report are produced</p>	M
FR113	<p>Unused voting ballots are counted before cast ballots</p> <p>Unused voting ballots are counted and annulled before voting boxes are opened.</p>	M
FR114	<p>Voting box integrity meeting minutes</p> <p>Voting results meeting minutes shall allow attachment of a Voting box integrity issues meeting minutes.</p> <p>These are produced in case when before cast votes counting BESV noticed that integrity of the voting box has been compromised.</p>	M
FR115	<p>Mobile Voting box votes cast mismatch</p> <p>Voting results meeting minutes shall allow attachment of a Mobile Voting box votes cast mismatch.</p> <p>These are produced in case when the number of cast ballots by mobile voting box does not match the number of voters who requested voting at their location.</p>	O
FR116	<p>Number of cast votes determined by count of signatures captured</p> <p>The signatures can be captured on:</p> <ul style="list-style-type: none"> • primary voter lists (voters assigned to this voting section) 	M

ID	Requirement	Mandatory or Optional
	<ul style="list-style-type: none"> votes cast a voter location supplementary voters list 	
FR117	Invalid votes The number of invalid votes are excluded from total number of cast votes in each election. Invalid votes are listed separately in BESV voting results.	M
FR118	Vote count special form consulted before voting results accepted Vote counts on a special form are shared with BESV members and accredited observers to ensure correctness of count.	M
FR119	Voting results template The paper format of the document is given in BESV Regulation annex 12. Refer: https://a.cec.md/storage/ckfinder/files/Anexa%2012%20_BESV%20si%20Anexa%2012a%20BESV%20_model%20PV%20birou%20final.docx Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).	M
FR120	Referendum Voting results template The paper format of the document is given in BESV Regulation annex 12a. Refer: https://a.cec.md/storage/ckfinder/files/Anexa%2012%20_BESV%20si%20Anexa%2012a%20BESV%20_model%20PV%20birou%20final.docx Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).	M
FR121	Votes count special form template The paper format of the document is given in BESV Regulation annex 10. Refer: https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special(1).docx Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).	M
FR122	Referendum Votes count special form template The paper format of the document is given in BESV Regulation annex 11. Refer:	M

ID	Requirement	Mandatory or Optional
	<p>https://a.cec.md/storage/ckfinder/files/Anexa%2010_BESV%20%C8%99i%20Anexa%2011_BESV_%20model%20fromular%20special(1).docx</p> <p>Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).</p>	
FR123	Preliminary vote count results are captured in a BESV vote count special form	M
FR124	Vote count special form captures valid votes for each competitor/option	M
FR125	<p>Sum of valid and invalid votes matches number of total cast ballots</p> <p>The sum of all invalid and valid votes cast for election competitors/referendum options shall match the number of cast votes.</p>	M
FR126	<p>Vote count special form signatures</p> <p>Vote count special form is signed by BESV president and representatives of election competitors.</p>	M
FR127	<p>BESV Voting results meeting minutes signatures</p> <p>BESV voting results meeting minutes is signed by:</p> <ul style="list-style-type: none"> • BESV president • BESV vice-president • BESV secretary • BESV (remaining) members 	M
FR128	<p>BESV Voting results missing signatures</p> <p>In case some members of the BESV are not able or refuse to sign the BESV Voting results meeting minutes - their reasons are listed in BESV activity report.</p>	M
FR129	<p>BESV Voting results meeting minutes values</p> <p>BESV voting results meeting minutes cover at least the following values:</p> <ul style="list-style-type: none"> • a) number of voters included in primary voter lists • b) number of voters included on supplementary voter lists • c) number of voters who received a voting ballot • d) number of voters who participated in elections • e) difference between number of voting ballots issued and the number of voters who participated in elections • f) number of invalid voting ballots • gn) number of votes for each election competitor/option • h) total number of valid votes 	M

ID	Requirement	Mandatory or Optional
	<ul style="list-style-type: none"> i) total number of voting ballots issued to BESV j) number of unused and annulled voting ballots <p>Note: This list replicates the values/counts consolidated by CECE: Refer FR211</p>	
FR130	BESV primary voter list number Number of voters on the primary voter lists assigned to a BESV is the number of voters on the primary lists on the day previous to elections.	M
FR131	BESV primary voter list count equal to Voter section preparation meeting minutes Number of voters on the primary voter lists matches values on both: <ul style="list-style-type: none"> BESV Voting results meeting minutes Voting section preparation meeting minutes 	M
FR132	Voters who received voting ballots Number of voters who received a voting ballot shall match the number of voter signatures for voting ballot receipt.	M
FR133	Deteriorated voting ballots count Deteriorated voting ballots are not cast and not in the voting box. For these BESV issued a second ballot that is cast. The number of deteriorated voting ballots sums only these ballots.	M
FR134	Sum of valid and invalid ballots equals the total number of cast ballots	M
FR135	Difference between voter participation and cast votes The difference between number voters who received voting ballots and the number of votes cast highlights possible "stolen" ballots (where the voter did not cast their vote in the voting box for some reason).	M
FR136	Number of valid votes Sum of votes for each of the candidates/options in an election represents the number of valid votes.	M
FR137	BESV assigned voting ballots Number of election voting ballots assigned to a BESV shall equal the sum of: <ul style="list-style-type: none"> valid ballots invalid ballots unused/annulled ballots 	M
FR138	Unused/annulled voting ballots Number of annulled election voting ballots includes: <ul style="list-style-type: none"> voting ballots that were not used voting ballots deteriorated by voters for which a replacement has been issued. 	M

ID	Requirement	Mandatory or Optional
FR139	<p>BESV activity report template</p> <p>The paper format of the document is given in BESV Regulation annex 13.</p> <p>Refer:</p> <p>https://a.cec.md/storage/ckfinder/files/Anexa%2013_BESV_raportul%20biroului%20electoral%20al%20sec%C5%A3iei%20de%20votare.docx</p> <p>Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).</p>	M
FR140	<p>BESV activity report notes</p> <p>BESV activity report include short notes regarding requests and contestations regarding BESV work/decisions.</p>	M
FR141	<p>Annulment of voting permit certificates template</p> <p>The paper format of the document is given in BESV Regulation annex 6.</p> <p>Refer:</p> <p>https://a.cec.md/storage/ckfinder/files/Anexa%206_BESV_%20Act%20de%20anulare%20a%20certificatelor%20pentru%20drept.docx</p> <p>Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).</p>	M
FR142	<p>Annulment of voting permit certificates based on their identifier</p> <p>Voting permit certificates that have not been issued to voters by the election date are annulled. Voting permit certificates have an incremented identifier and are listed in the annulment act as a range from-to.</p>	M
FR143	<p>Pre-populate documents with known values</p> <p>Based on the election, election type, BESV user etc the system shall pre-populate electoral record forms and documents with values such as:</p> <ul style="list-style-type: none"> • election • election date • BESV • BESV president • BESV members • election competitors/options 	M
FR144	<p>BESV voting results numbers validation</p> <p>BESV voting results numbers shall comply with the following relations:</p> <ul style="list-style-type: none"> • $c = a + b$; • $c = d$; • $d = f + h$; 	M

ID	Requirement	Mandatory or Optional
	<ul style="list-style-type: none"> • $e = c - d$; • $f = d - h$; • $h = g_1 + g_2 + g_3 + g_4 + \dots + g_n$; • $i = c + j$; • $j = i - c$. <p>Refer BESV regulation annex 12 and/or FR129 for letter assignments. Vendor will coordinate with CEC if other checks of the numbers are to be applied.</p>	
FR145	BESV electoral records access Operators representing a BESV have access to the electoral records of this BESV only.	M
FR198	Electoral records changes Once an electoral record has been submitted it cannot be changed in the system. Corrections will be made outside e-Day system using existing processes.	M
FR199	Electoral records in PDF format The system prepares PDF format variants of the electoral records based on similar paper templates.	M

Circumscription functional requirements

ID	Requirement	Mandatory or Optional
FR201	CECE Voting participation report Voting participation report is produced at CECE level and is available for CECE operators only.	M
FR202	CECE Voting participation report access CECE is restricted access to voting participation data within their jurisdiction only (subordinated electoral organizations).	M
FR203	CECE Voting participation report values CECE voting participation report aggregates the data regarding voter participation within its subordinated electoral organizations. The report lists participation in each of the subordinated electoral organizations too.	M
FR204	CECE Voting participation time CECE voting participation report displays the time used for participation calculations.	M
FR205	CECE Voting participation frequency CECE voting participation report uses 5 minute down rounding of the voter participation report, meaning a report requested at 11:23 will round the time to 11:20 and use this to	M

ID	Requirement	Mandatory or Optional
	<p>extract the report. This is intended to avoid constant "refreshes" by restless users thus putting unnecessary strain on the system.</p> <p>5 minutes is the default setting. It shall be configurable and allow values of 10, 15, 30 minutes.</p>	
FR206	<p>CECE Voting participation cache</p> <p>Once a report has been produced for example at 11:20 the system can cache the report and make it easily available in case a user attempts to refresh it at 11:22, 11:23:45 etc.</p>	M
FR207	<p>CECE Voting results meeting minutes template</p> <p>The paper format of meeting minutes of Results are given in CECE Regulation annex 14. Refer: https://a.cec.md/storage/ckfinder/files/anexa14_PV_CECE_totalizare_general(1).docx Vendor shall coordinate with CEC the electronic form of the document (if different from the paper variant).</p>	M
FR208	<p>CECE electoral records access</p> <p>CECE operator can access/edit only the electoral record of the CECE they represent.</p>	M
FR209	<p>CECE voting results based on BESV meeting minutes</p> <p>CECE voting results meeting minutes consolidates data reported by subordinated electoral organizations.</p>	M
FR211	<p>CECE Voting results meeting minutes values</p> <p>CECE voting results meeting minutes cover at least the following values:</p> <ul style="list-style-type: none"> • a) number of voters included in primary voter lists • b) number of voters included on supplementary voter lists • c) number of voters who received a voting ballot • d) number of voters who participated in elections • e) difference between number of voting ballots issued and the number of voters who participated in elections • f) number of invalid voting ballots • gn) number of votes for each election competitor/option • h) total number of valid votes • i) total number of voting ballots issued to BESV • j) number of unused and annulled voting ballots <p>Note: This list replicates the values/counts determined by BESV. Refer FR129.</p>	M
FR212	<p>CECE voting results numbers validation</p>	M

ID	Requirement	Mandatory or Optional
	<p>CECE voting results numbers shall comply with the following relations:</p> <ul style="list-style-type: none"> • $c = a + b$; • $c = d$; • $d = f + h$; • $e = c - d$; • $f = d - h$; • $h = g1+g2+g3+g4+...+gn$; • $i = c + j$; • $j = i - c$. <p>Refer CECE regulation annex 14 and/or FR211 for letter assignments. Vendor will coordinate with CEC if other checks of the numbers are to be applied.</p>	
FR213	<p>CECE voting results meeting minutes by election type</p> <p>CECE voting results meeting minutes are recorded in (slightly different formats) depending on election type.</p>	M
FR214	<p>CECE Voting results meeting minutes for local councils</p> <p>The paper format of meeting minutes of Results are given in CECE Regulation annex 14b. Refer:</p> <p>https://a.cec.md/storage/ckfinder/files/Anexa14b_totalizare_ConsiliuLocal.docx</p> <p>Vendor shall coordinate with CEC the electronic form of the meeting minutes (if different from the paper variant).</p>	M
FR215	<p>CECE Voting results meeting minutes for mayors</p> <p>The paper format of meeting minutes of Results are given in CECE Regulation annex 14c. Refer:</p> <p>https://a.cec.md/storage/ckfinder/files/anexa14c_PV_totalizare_primar%20(2)(1).doc</p> <p>Vendor shall coordinate with CEC the electronic form of the meeting minutes (if different from the paper variant).</p>	M
FR216	<p>CECE Voting results meeting minutes for referenda</p> <p>The paper format of meeting minutes of Results are given in CECE Regulation annex 14d. Refer:</p> <p>https://a.cec.md/storage/ckfinder/files/anexa14d_HCECE_PV_totalizare_referendum%20(1)(1).docx</p> <p>Vendor shall coordinate with CEC the electronic form of the meeting minutes (if different from the paper variant).</p>	M
FR217	<p>CECE members can add their written comments to Voting results meeting minutes</p>	M

ID	Requirement	Mandatory or Optional
	The form shall enable each of the members to offer their written comments in the meeting minutes.	
FR218	CECE activity report CECE (president) prepares and signs a CECE activity report that lists: <ul style="list-style-type: none"> • activity by CECE itself • consolidated data of subordinated electoral organizations 	M
FR219	CECE activity report template The paper format of meeting minutes of Results are given in CECE Regulation annex 15. Refer: https://a.cec.md/storage/ckfinder/files/anexa15_RaportCECE(1).docx Vendor shall coordinate with CEC the electronic form of the meeting minutes (if different from the paper variant).	M
FR220	CECE members can add their written comments to CECE activity report The form shall include for each of the members to offer their written comments in the activity report.	M
FR221	CECE activity report consolidates subordinate electoral organization activity CECE activity report consolidates data presented by subordinated electoral organizations in their activity reports.	M
FR222	CECE activity report allows changes to consolidated data CECE activity report allows users to make changes to consolidated data from subordinate electoral organizations. This is intended to allow for cases when some subordinate electoral organizations were not able to submit their activity reports in time.	M
FR223	CECE voting results allows changes to consolidated data CECE voting results meeting minutes allows users to make changes to consolidated data from subordinate electoral organizations. This is intended to allow for cases when some subordinate electoral organizations were not able to submit their data in time.	M
FR226	CECE activity report consolidated data items CECE activity reports consolidates data from subordinate electoral organizations for sections 4, 5, 6, 7 as listed in CECE regulation annex 15. Vendor shall coordinate with CEC the exact attributes that are consolidated as they relate to BESV regulation annex 13.	M

CEC functional requirements

ID	Requirement	Mandatory or Optional
FR501	<p>e-Day initialization process</p> <p>Vendor shall coordinate with CEC what e-Day initialization process is used and the step to step it is performed.</p> <p>At a high level, e-Day initialization prepares a new MS SQL Server database for e-Day system and populates it with data already prepared in SAISE Admin with data for a single election day. Note that more than one election types can take place during the same election day - for example for parliament and local mayors.</p> <p>CEC will provide the available information to the selected vendor to its entire toolchain, configurations and scripts.</p>	M
FR502	<p>e-Day users</p> <p>e-Day users and their designation to represent a specific BESV or CECE are included in the initialized e-Day database. This shall be used to subsequently limit/grant access to e-Day functionality.</p>	I
FR503	<p>e-Day electoral organizations</p> <p>e-Day electoral organizations are managed in SAISE Admin and assigned to an election (cycle). This data is included in e-Day during initialization.</p>	M
FR504	<p>e-Day voter lists</p> <p>e-Day (authorized) voters lists are maintained outside the system and are included in e-Day during its initialization.</p>	M
FR505	<p>e-Day 2.0 data</p> <p>Data objects for e-Day 2.0 enhancements shall be accounted for during initialization, including default values and other configuration data (such as for example document templates).</p>	M
FR506	<p>e-Day 2.0 data structure changes should minimize changes to existing informational objects</p> <p>To offer a reliable backwards compatibility with prior e-Day data it is desirable that the changes to existing informational objects are kept to an absolute minimum. Intermediate data structures that are linked with existing data are preferred to changes of e-Day 1.0 data structures.</p>	M
FR507	<p>e-Day administrators are offered options to review collected e-Day data</p> <p>The data already collected in e-Day is offered to Administrative personnel for easy review in the e-Day 2.0 UI.</p>	M
FR508	<p>e-Day 2.0 statistics</p>	M

ID	Requirement	Mandatory or Optional
	When administrative personnel navigate e-Day 2.0 data the system presents counts at electoral organization and its subordinates level (total and detail counts).	
FR509	e-Day 2.0 statistics by electoral organization Statistics by electoral organization groups data by selected electoral organization and its direct subordinates and sums the totals and subtotals of each electoral record. This view can be drilled down from CEC -> regional CECE -> local CECE to see the lower-level details.	M
FR510	e-Day 2.0 statistics by electoral record The statistic by electoral record allows review of electoral records of a specific type with details of what electoral organization produced it. This list can be filtered at CECE level.	M
FR511	e-Day 2.0 data view Administrative personnel are offered the functionality to view the electoral record and its associated document.	M
FR512	e-Day 2.0 statistics for drafts Drafts of electoral records are counted and presented separately	M
FR513	e-Day 2.0 tabular data sorting Tabular data used to display statistics shall include options to sort the data by all the columns.	M
FR514	e-Day 2.0 tabular data paging Tabular data used to display statistics shall include paging functionality. Default page size is 50 rows and can be changed by the user.	M
FR516	Election opening hours management Opening hours management shall extend existing Open/Closed voting per voting sections of e-Day 1.0.	M
FR517	Voting open/closed manual setting Voting open/closed setting by voting section shall be included to allow an easy manual override for temporary voting suspended during the election day or to forcibly close voting in case of errors in open/close time setting.	M
FR518	Apply changes in bulk Open/Close time and flags can be set in bulk across a selection of voting sections. There should be an option for the user to mark manually or all voting sections in a list and apply the same value to all.	M

ID	Requirement	Mandatory or Optional
	Note: There are 1500+ voting sections in general elections. The lists of voting sections shall rely on pagination, sorting and filtering (by CECE) to allow users to pinpoint the exact voting sections where changes are be made.	
FR519	Election competitors Voting results include values for election competitors. This data shall be prepared in e-Day 2.0 during initialization.	M
FR520	Members of BESV/CECE In order to fill the required data e-Day 2.0 might require data regarding electoral organization members including president, vice president and secretary.	M

4.2 Non-Functional Requirements

Non-functional requirements provide quality characteristics of the overall system such as security, performance or maintainability.

Architecture requirements

ID	Requirement	Mandatory or Optional
NFR010	Open standards The solution architecture shall be based on relevant open standards. The solution architecture shall not use proprietary standards.	M
NFR011	Service Oriented Architecture The solution shall be based on a Service Oriented Architecture.	M
NFR012	Hosting environment The solution shall not include any hardware components on the server side and will be deployed on governmental cloud environment (MCloud).	M
NFR013	Running environment System shall run on Docker container engine and shall not depend on specific host OS instance. Building container images shall be automated. (refer to the following link for details: https://docs.docker.com/develop) Running in a container-based environment, the application must be elastic, including when adding/removing application container instances (above minimum required instances for HA), changing of configurations and system parameters has no impact on any work in progress, such as any active sessions, requests, etc.	M
NFR014	Multiple sites	O

ID	Requirement	Mandatory or Optional
	The solution architecture shall ensure high availability including during new versions deployment and the possibility to run simultaneously on multiple sites	
NFR015	Browser compatibility requirements The system shall be compatible with latest two major versions (to be considered at the time of system acceptance) of two of the following web browsers: Chrome, Safari, FireFox and Edge.	M
NFR016	API for integration with governmental platform services and third-party systems The system shall expose API for core functionality to be consumed by governmental platform services (at least for MPass, MCabinet and MAccess) and by third party systems. The full list of logically applicable APIs and their format will be detailed during analysis and design stages.	M
NFR017	Detailed data model System's detailed data model shall be described fully in a machine-readable data scheme for example using a DDL language for relational databases. The Consultant shall coordinate the detailed data model schema format with the Purchaser in advance.	M

Documentation and Training requirements

ID	Requirement	Mandatory or Optional
NFR019	Languages and communication All communication under this assignment shall be in Romanian. The Consultant shall ensure, if necessary, interpretation during meetings, presentations and briefings organised during the assignment, as well as translation of assignment related documentation and deliverables. All the technical documentation will be provided in one language, either Romanian or English. End-user material and documentation shall be provided in Romanian, for better understanding of the Beneficiary.	M
NFR020	User Documentation The Consultant will prepare and deliver the following documentation for end-users: <ul style="list-style-type: none"> Interactive guidance included in user interface adjusted to user role Downloadable user manuals in PDF format Downloadable user manual for system Administrators in PDF format.	M
NFR021	How-To video tutorials The Consultant will prepare How-To video tutorials for system's main functions.	M

ID	Requirement	Mandatory or Optional
NFR022	Technical documentation The Consultant will prepare and deliver the following technical documentation: <ul style="list-style-type: none"> • System architecture documentation (including description of models in UML language, which will include a sufficient level of details of the system architecture) • Test strategy • Compilable and documented source code for applications, components and unit tests developed within the project • System installation and configuration manual (including code compilation, container image build scripts, system installation, hardware and software requirements, platform description and configuration, backup and disaster recovery procedures) 	M
NFR023	API documentation The Consultant will prepare and deliver: <ul style="list-style-type: none"> • API integration guide • Integration samples in .NET and Java • Human and machine-readable description in a standard description language (e.g. WSDL or Swagger). 	M
NFR026	Training sessions The Consultant will provide on-line training sessions using developed e-learning modules for the following target groups: <ul style="list-style-type: none"> • System Administrators • CEC appointed representatives. 	M
NFR027	Training materials Training documentation – curricula, training courses (manuals, video tutorials, quizzes, etc.) for administrators, services providers and end-users (individuals and businesses) developed in e-learning platform based on Moodle.	O

Licensing and rights requirements

ID	Requirement	Mandatory or Optional
NFR030	Perpetual software license The Consultant grants to the Client the rights to run and use entire solution with all included software components with no constraints on time, location and offered functionality.	M
NFR031	Redistribution rights The Consultant shall grant to the Client the right to re-distribute the solution. While the Client does not intend to re-distribute at a massive scale it still envisions the need to transfer the software solution to another state agency due for example to potential	M

ID	Requirement	Mandatory or Optional
	reorganization. Also, the Client might get the opportunity to re-deploy the entire platform elsewhere.	
NFR032	Full data rights The Client keeps full rights on data created by the means of this solution.	M
NFR033	Open data format The solution preserves the data in an open format or includes mechanisms to extract data from the system in an open format thus enabling the capability to transfer/migrate the data into another system.	M
NFR034	Third party licenses The third party licenses required for the solution shall be listed in the proposal and system documentation. Third party licenses shall highlight how often the license needs to be renewed and at what cost.	M

System integration requirements

ID	Requirement	Mandatory or Optional
NFR040	Governmental platform services integration The system integrates the following government platform services <ul style="list-style-type: none"> • MPass used to authenticate users • MLog used to journal business critical events. The events that are business critical will be defined at analysis and design stages and must be configurable. • MNotify used for notifications. The system shall include facilities to switch on/off the use of each of these services.	M
NFR042	Open data integration The system shall publish agreed sets of data to Open Data portal located at date.gov.md using its API.	M

System performance requirements

ID	Requirement	Mandatory or Optional
NFR062	Concurrent users The system standard load and performance shall be guaranteed for 5000 concurrent human users.	M
NFR063	Concurrent system requests	M

ID	Requirement	Mandatory or Optional
	The system shall be designed to respond (via API requests) to at least 1000 concurrent external system requests.	
NFR064	Response time Response time for system functions shall be under 2 (two) seconds. The Consultant shall list the exceptions, if any, and discuss/agree them with the Client at analysis and design stages.	M
NFR065	Daily transactions The system shall be designed to process at least 3200000 transactions per day.	M
NFR066	Key performance Indicators The system shall meter and expose its key performance indicators. The Consultant shall propose the list of indicators and discuss/agree them with the Client.	M
NFR067	Asynchronous processing System shall use asynchronous processing whenever possible to perform any input-output. For example when users upload a large file the system shall not block user interface while upload operation takes place. Instead a progress indicator can be used to highlight progress while the user is able to work on other parts of the system.	M
NFR068	Uploaded size limits The system enforces an file size rule for files uploaded/submitted by users. These values are configurable. The limits are different on: <ul style="list-style-type: none"> frontoffice: 5MBytes default backoffice: 5MBytes default 	M
NFR069	Performance load/stress test Performance load/stress test plan shall be reviewed and adjusted in coordination with the Beneficiary. Performance load/stress test shall be run and results presented and agreed by the Beneficiary.	M

System maintenance requirements

ID	Requirement	Mandatory or Optional
NFR050	System logs The system shall log its various actions and events in a structured manner. Logging shall be configurable and based on extensible logging framework (such as log4net, nlog, etc.). Logging framework shall minimally support JSON format and the following targets: console, rolling files, UDP and HTTP POST.	M

ID	Requirement	Mandatory or Optional
NFR051	<p>Log levels and event log records</p> <p>The system shall differentiate events and actions it logs into at least following levels: Critical, Error, Warning, Info, Debug</p> <p>Critical and Error level events shall be logged only for non-recoverable error that require human intervention.</p> <p>Event log records will include at least:</p> <ul style="list-style-type: none"> • the type of the event • timestamp when the event took place • event level • system component that produced the event • user/user agent, IP that triggered the event • information object identifier affected • textual details about the produced event 	M
NFR052	<p>Graceful shutdown</p> <p>The system shall implement graceful shutdown, i.e. shutting down an application container instance at any time shall not impact any work in progress, such as any active sessions, requests, event logs, etc.</p>	M
NFR053	<p>Source code</p> <p>The Consultant shall supply all the source code for system components that are not available as COTS from third parties.</p> <p>The source code shall use package managers for dependencies to 3rd party libraries. All prerequisite software must be part of container image definition and based on public container repository</p>	M
NFR054	<p>System deployment</p> <p>The Consultant shall supply the deployment procedure and supporting tools for this. Deployment procedure shall cover all the prerequisites before proceeding to system installation. The deployment shall be automated and include database structure initialization and seeding.</p>	M
NFR055	<p>System upgrades</p> <p>System upgrades shall be automated, including database upgrade/downgrade scripts or code. To enable rolling upgrades in production environment, the recommended practice is to perform database breaking changes in incremental changes.</p>	M

User Interface requirements

ID	Requirement	Mandatory or Optional
NFR070	Multilanguage User Interface The system shall support multilanguage user interface. This support includes data type specific formats (such as date, time, time spans, currencies, etc.). The system will be delivered with at least Romanian and English interfaces. The default language shall be Romanian.	M
NFR071	User Interface accessibility User interface shall conform at least to Level A of Web Content Accessibility Guidelines 2.0. https://www.w3.org/TR/WCAG20/	M
NFR072	Responsive/Adaptive design The system user interface shall automatically adapt to various display resolutions. Minimal display width is 1280px. The system's UI shall be implemented using progressive web application (PWA) technologies and shall be functional on mobile devices.	M
NFR073	Contextual help User Interface elements shall include Tips and Hints for user interface elements.	M
NFR074	Client support All pages shall include client support contacts.	M
NFR075	Bookmarks All major pages shall be bookmarkable and the User shall be able to access bookmarked pages later. The bookmarkable pages will be defined at analyzing stage.	M
NFR076	Friendly URLs The system shall use friendly URLs for accessing its pages.	M

Information Security requirements

ID	Requirement	Mandatory or Optional
NFR080	Secure by design The system shall be secure by design and comply with the relevant requirements specified in GD 201 from 28.03.2017 (http://lex.justice.md/md/369772/).	M
NFR081	Security design documentation The Consultant shall supply documentation describing design of security features and supporting evidence that such a design is secure.	M

ID	Requirement	Mandatory or Optional
	Note that the Consultant will coordinate with the Purchaser the format of the documentation, supporting evidence and list of requirements to comply with.	
NFR082	Least privilege principle enforcement The system's components shall rely on the least privilege principle and run under such a limited privilege account under the OS rights model. The documentation shall highlight each of the system's components required privilege level and considerations that force use of that level or access.	M
NFR083	Secrets and addresses Secrets (passwords, private keys and certificates, connection strings) and addresses of external services shall be clearly delineated in configuration documentation and easily modifiable via automated scripts.	M
NFR084	Secure communication channels All system's communication with external systems or users takes place over encrypted communication channels.	M
NFR086	Minimize personal information storage The system shall minimize the amount of personally identifiable information stored. For example, there is no need to store a user's First and Second names since this will be provided after authentication. The system shall comply with the relevant requirements related to personal data processing specified in GD 1123 from 14.12.2010 (http://lex.justice.md/md/337094/) Note that the Consultant shall coordinate with the Purchaser the list of requirements to comply with.	M
NFR087	Secure against OWASP Top 10 vulnerabilities The system shall include security controls for all its components for at least OWASP Top 10 vulnerabilities. Refer https://www.owasp.org/index.php/Category:OWASP_Top_Ten_Project	M
NFR088	Health-check API The system shall expose readiness and health-check API via a HTTP GET requests. The health-check shall check the health of as many system components as possible. In case of health check error, a human-readable error message shall be returned.	M
NFR090	Session expiration The system shall include a session expiration mechanism when after a specific period of inactivity, the user is required to authenticate again. The period of inactivity shall be configurable and by default it is 15 mins.	M
NFR091	Authorized access to personal content	M

ID	Requirement	Mandatory or Optional
	Users are granted access to content designated as belonging to them. Content belongs to a user if it has been assigned/addressed to their personal IDNP or the organization that granted them access.	
NFR092	Input validation All input data shall be validated on client and server side.	M
NFR093	User content User content can be captured in text format only. The system shall forbid entry of special characters used for formatting and markup of special Web content. Otherwise all UNICODE characters shall be possible to enter/view by system's components.	M
NFR094	Unauthorized access attempts When the system registers unauthorized access attempts it shall: <ul style="list-style-type: none"> log such attempts with at least ERROR level provide users with a warning message that access is not authorized and that abuse will be investigated 	M
NFR095	Data integrity The Consultant will ensure data integrity by providing appropriate solution for prevention of unauthorized internal activities (for ex. deletion of records directly from database).	M
NFR097	Review if security patterns implemented are used and adequate Security patterns shall be reviewed and assessed if adequate. These shall be refactored in order to provide secure functionality.	M
NFR098	Validate system is secure by default Newly setup/updated system shall be secure. Some default settings or access data might be insecure. It shall be changed to secure defaults.	M
NFR099	Web Application Firewall System setup shall use an active scanning and filtering component that ensures only expected communication passes to the system application. Usually this can be achieved by using a Web Application Firewall. The allow/deny list should cover all system endpoints. Note that such setups allow "wildcard" settings that allow everything to pass through the firewall. This shall be avoided.	M
NFR190	Protect against typical security threats System shall use security measures to protect against common vulnerabilities included but not limited to: <ul style="list-style-type: none"> SQL injection, 	M

ID	Requirement	Mandatory or Optional
	<ul style="list-style-type: none"> • cross-site scripting (XSS), • cross-site request forgery (CSRF), • file inclusion, • cookie poisoning etc <p>These shall be documented including how this is achieved and verified.</p>	
NFR191	Vulnerability scanning System shall be scanned using a industry standard vulnerability scanning solution. All moderate to high recommendations shall be documented and addressed in documentation, default configuration and application as appropriate. The final vulnerability scan shall identify no moderate or higher recommendations.	M
NFR192	Penetration testing Penetration testing shall be performed on a typical setup of the test environment. All identified weaknesses shall be reported. Relevant weaknesses shall be fixed.	M
NFR193	Monitoring security events Recommendation how security events shall be spotted and traced in overall system logging shall be offered. These include search and filtering criteria but also references to what external tools to use to monitor them.	M
NFR194	Update technology stack Good security cannot be achieved with outdated technology. The vendor shall recommend updates/upgrades of underlying technology stack (operating system, application framework, web server, DBMS) to up-to-date versions. The exact versions that the Beneficiary can provide will be coordinated during the project. The system shall be tested and verified to work (both existing and new functionality) on the updated underlying technology stack.	M

Warranty and support

ID	Requirement	Mandatory or Optional
NFR100	Support During the warranty period the Consultant shall provide necessary technical assistance to the Client	M
NFR101	Warranty fixes During the warranty period the Consultant shall: <ul style="list-style-type: none"> • fix all defects reported by the Client; • solve all incidents reported by the Client according to the agreed SLAs; 	M

ID	Requirement	Mandatory or Optional
	<p>Note: The response and resolution time shall not exceed 8 hours for non-critical defects and 1 hour in case of critical defects.</p> <p>The incidents shall be solved within 2 working days for non-critical incidents and within 4 working hours for critical incidents starting from escalation time. Hourly progress report will be provided for critical items.</p>	
NFR102	Warranty period of 12 months	M
NFR103	Enhancements and adjustments <p>The vendor shall propose a model for assisting the Beneficiary with enhancements and adjustments to the system during the warranty period. The model can account for designated personnel availability and the type of activities performed to accomplish this.</p>	M

Progress and reporting

ID	Requirement	Mandatory or Optional
NFR900	Beneficiary monitoring <p>The Beneficiary will delegate its representative to participate in daily or weekly development team status meetings. The representatives will provide answers/clarifications subsequent to issues being raised and will escalate risks to Beneficiary management.</p>	M
NFR901	Beneficiary preference for working code <p>The Beneficiary has a preference to infer progress based on working code instead of reports. It is expected that the vendor team will focus on configuring and setting up even early in the development/implementation process of incomplete system that works.</p>	M
NFR903	Beneficiary demonstrations <p>The Beneficiary expects a first demonstration of the working system as early as after 3-4 weeks since project startup.</p> <p>Subsequent demonstrations are expected after each 3 weeks of development.</p>	M
NFR904	Beneficiary flexibility <p>The Beneficiary understands that the vendor is in a position to offer and implement technological solutions (and scenarios) that are of the same quality or better. The Beneficiary welcomes the vendor team to suggest alternative implementations that achieve similar goals.</p>	M
NFR905	Beneficiary ready to descope unfeasible requirements <p>The Beneficiary understands that for a selected design or technology some of the requirements might be hard, resource consuming and marginal in value. The Beneficiary</p>	M

ID	Requirement	Mandatory or Optional
	expects vendor's team to pinpoint such specific requirements and if indeed the value of the requirement is marginal it is ready to descope it from an initial version of the system.	

4.3 Other Requirements and Institutional Arrangements

Institutional Arrangements

The duration of this current assignment is **September 2022 – February 2023**, excluding 12 months of warranty and maintenance period. It is expected that the company will allocate the number of experts/days that will be required for the implementation of this contract. Should the experts be changed during the implementation process, the company should ensure that they meet the criteria for the position replaced, as indicated in this ToR. Moreover, a timely notification should be sent to the Project Team and Beneficiary in this sense.

The company should submit all deliverables in due time and allocate enough time for review and feedback. Generally, UNDP expects a maximum of 14 (fourteen) days (depending on the implementation stage) to review the deliverables, provide comments, approve/deny, or certify acceptance of deliverables. Before submission of the final versions of deliverables, the Service Provider shall discuss the preliminary versions with the parties involved, so that the final products reflect their comments and suggestions. All the deliverables of the Service Provider shall be coordinated with the Project Team accordingly.

The working language for this assignment shall be Romanian. All technical, end-user documentation and other materials related to the assignment such as the training materials, How-to-videos, testing reports, etc. shall be developed as specified above in the Documentation and Training requirements table under chapter 4 (see NFR019).

The Service Provider will work under the guidance of the Beneficiary (the CEC) and the UNDP Project Manager for substantive aspects of the assignment, as well as under the direct supervision of the UNDP Project Officer for administrative aspects.

The Service Provider is expected to cooperate closely with representatives of the CEC management and delegated staffers from the specialized departments, as well as other relevant parties involved, when applicable.

Qualification Requirements

The Bidder shall provide sound argumentation of its proposal by demonstrating compliance with the ToR, including information on the volume of allocated resources to carry out the assignment. A breakdown per working days allocated for each deliverable shall be submitted, clearly explaining the role of the team members involved in producing the deliverable. In this context, the provided information shall clearly reflect the distribution of tasks and allocation of working days deemed necessary for the respective engagement.

Criteria for the evaluation of the Bidder / Company

A successful bidder shall meet the following minimum qualification requirements for the assignment:

Legal Status - Vendor is a legally registered entity and can ensure rapid local response (including presence of staff) to any of the contract related requests (whenever through local branch or office, through a local consortium partner – all business relations to be documented through official documents/contracts submitted with the proposal).

Eligibility - Vendor is not suspended, nor debarred, nor otherwise identified as ineligible by any UN Organization or the World Bank Group or any other international Organization.

Conflict of Interest - No conflicts of interest.

Bankruptcy - Not declared bankruptcy, not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against the vendor that could impair its operations in the foreseeable future.

History of Non-Performing Contracts - Non-performance of a contract did not occur as a result of contractor default for the last 3 years.

Litigation History - No consistent history of court/arbitral award decisions against the Bidder for the last 3 years.

Previous Experience

- Minimum 5 (five) years of relevant experience in developing IT systems.
- Minimum 2 (two) finalized contracts of similar size and complexity in IT systems development or upgrade area implemented over the last 5 years. For ongoing projects, copies of acceptance documents of the entire software solution shall be provided.
- Specific experience in building ICT infrastructure, proven through the design of at least 2 (two) information systems (information systems in the designing of which the Bidder was involved).

Financial Standing - Minimum average annual turnover of USD 75,000 for the last 3 years. Bidder must also demonstrate the current soundness of its financial standing and indicate its prospective long-term profitability.

Criteria for the evaluation of key personnel

The proposed team should consist of but not be limited to the following members:

- Project Manager
- Senior Software Developer / Technical Lead
- Software Analyst

Qualifications of key personnel proposed

1 Project Manager

- University degree in Management, Engineering, ICT or another relevant field;
- At least 5 (five) years of experience in project management of projects on developing IT applications/systems, services, etc.;
- Experience in a similar position in at least 2 (two) similar software development projects using agile approach;
- Proven certification in Project Management (Prince, PMI, etc.) would be an asset;
- Experience in managing projects for public authorities would be an asset
- Proficiency in Romanian and English languages.

2 Senior Software Developer / Technical Lead

- University degree in Computer Science or another relevant domain;
- At least 5 years of experience in software development;
- Participated in at least 2 (two) software development projects using agile approach;
- At least 3 years of experience in software development using C#, Entity Framework, ASP.NET MVC, SQL Server and a dependency injection framework;
- Certifications in any technology from the required technology stack mentioned above is an asset;
- Proficiency in Romanian and English languages.

3 Software Analyst

- University degree in Computer Science or another relevant domain;
- At least 5 years of experience in software development;
- Participated in at least 2 (two) software development projects using agile approach;
- Experience in managing projects for public authorities would be an asset;
- Certifications in any technology from the required technology stack (i.e. C#, Entity Framework, ASP.NET MVC, SQL Server and a dependency injection framework) is an asset;
- Proficiency in Romanian and English languages.

The bidder will provide support facilities to their team of experts (back-stopping) during the implementation of the contract.

UNDP Moldova is committed to workforce diversity. Women, persons with disabilities, Roma and other ethnic or religious minorities, persons living with HIV, as well as refugees and other noncitizens legally entitled to work in the Republic of Moldova, are particularly encouraged to apply. Applicants demonstrating equitable gender representation and diversity within the team will have an advantage.

During the assignment, the Service Provider's team of experts should prove commitment to the core values of the United Nations, in particular, respecting differences of culture, gender, religion, ethnicity, nationality, language, age, HIV status, disability, and sexual orientation, or other status.

5. Key Deliverables and Project Timeline

e-Day 2.0 implementation activities regarding analysis, design, development, testing, training and implementation are expected to follow the following preliminary timeline. The start and duration (in weeks) of which stage is represented below starting with the project inception:

nr	Phase/activity	W1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	..	72
1.	e-Day Inception	x																					
2.	Analysis and Design	x	x	x																			
3.	Software development and integration			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
4.	Software testing					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	- performance tests																	x	x	x	x		
	- security tests																	x	x	x	x		
5.	Acceptance in production																				x		
6.	Training															x	x	x	x				
7.	Go Live (in production)																				x		
8.	Warranty and maintenance																				xxxx		

The timeline above is tentative and depicts main software development phases/activities as follows:

1. During project inception the vendor and the Beneficiary will coordinate the work plan, communication and coordination plans. This activity takes place during the first week of the project.
2. During analysis and design the vendor will revisit the existing system and documentation surrounding it and will adjust its proposal plans, designs and raise issues and opportunities with the Beneficiary to coordinate in advance.
3. During development and testing phases most of the required system adjustment work is planned, executed and validated.
4. Performance and security tests are highlighted as they are important for e-Day viability. These will take place during last month of the development to make sure that development and design changes do not affect the results of the tests.
5. During the last 2-3 weeks of the project the system is implemented on production environment and acceptance testing takes place by the Beneficiary representatives.
6. Trainings start late in the project but in advance of acceptance testing to ensure Beneficiary representatives are familiar with the solution in order to be able to validate whether it works to their needs.
7. Finally, once the system is put in production the warranty and maintenance period starts. This extends to a one-year period (T+52 weeks).

The selected Contractor is expected to provide the following deliverables according to the schedule suggested above:

1. Inception Report and Preliminary Project Plan developed.
2. Module Design Document developed (provide two initial design variants of the module updates and the final version of the module design, which includes a narrative description of the updates and functionalities).
3. Compiled and documented source-code of the updated e-Day 2.0 Module (including the instruments and libraries, where applicable, and intermediary source-code for updated functionalities under the agreed timeline) fully compatible and functional on the Beneficiary's platform.
4. Software installation package, which shall include installation and configuration guidelines (how to install application, hardware and software requirements, platform description and configuration, application configuration, disaster recovery procedures etc.) and software licenses (where applicable)

submitted.

5. Software testing plan and report provided.
6. Functional, performance and security testing reports submitted.
7. Acceptance in production.
8. Training and user documentation provided.
9. Full roll out of the e-Day 2.0 - Go Live (in production).
10. Warranty and maintenance (provision of maintenance support for a period of at least 12 months).