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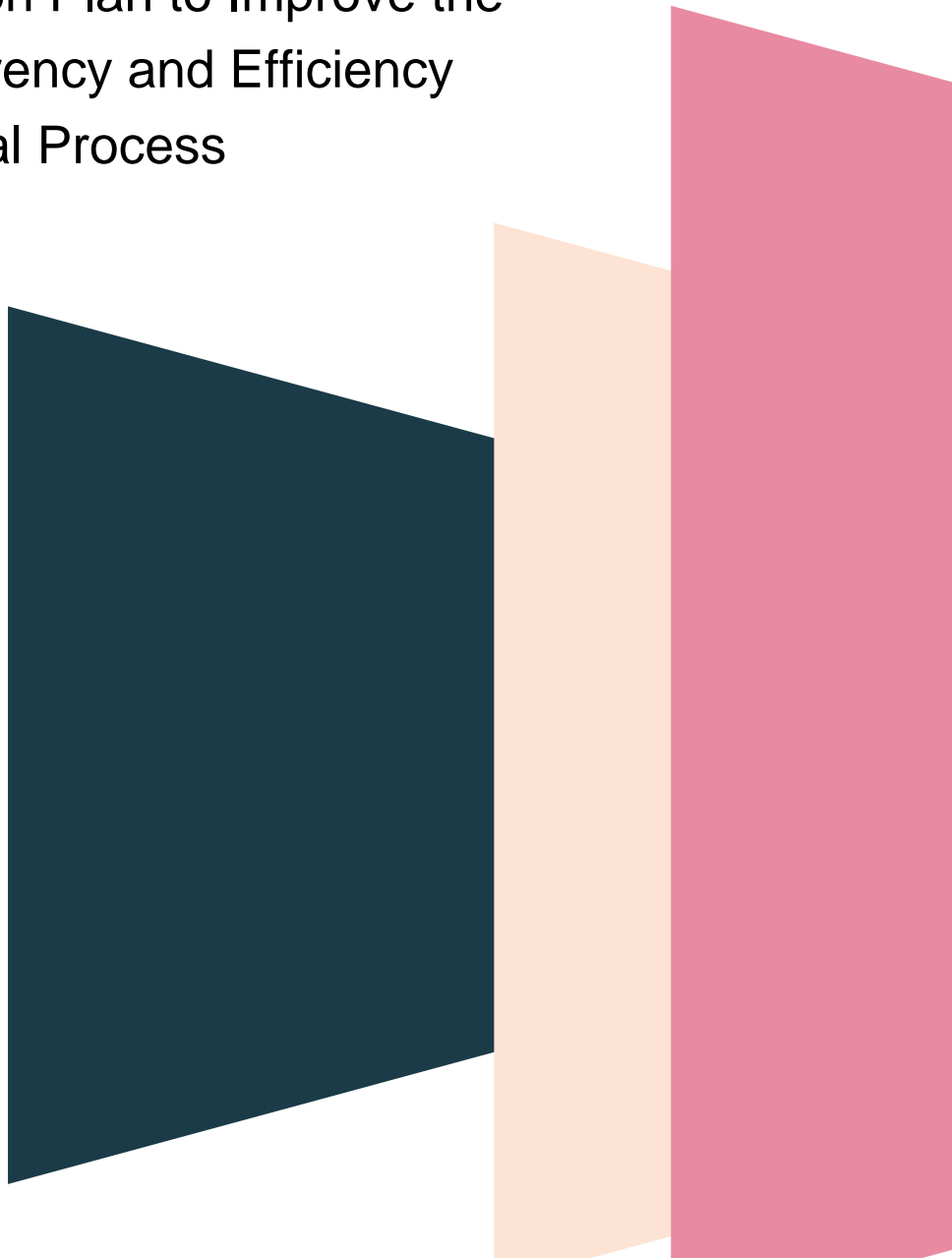
Part 2 – Action Plan

Strategy and Action Plan to Improve the Integrity, Transparency and Efficiency in the BiH Electoral Process

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1 Acronyms and abbreviations

| | |
|------------|---|
| APPs | Applications |
| BiH | Bosnia and Herzegovina |
| CVR | Central Voters Register |
| CDN | Content Delivery Network |
| CEC | Central Electoral Commission |
| CM | Change management |
| DMS | Document Management System |
| EC | European Commission |
| EPB | Electronic Pollbook |
| EU | European Union |
| GDPR | General Data Protection Regulation |
| GIS | Global Information System |
| HR | Human Resources |
| ICT | Information and Communications Technology |
| ID | Identity document |
| IT | Information Technology |
| KPIs | Key Performance Indicators |
| MEC | Municipal Electoral Commission |
| MIA | Ministries of Internal Affairs |
| NGO | Non-Governmental Organisation |
| OSCE | Organization for Security and Co-operation in Europe |
| OSCE/ODIHR | OSCE/ Office for Democratic Institutions and Human Rights |
| PDF | Portable Document Format |
| PMO | Project Management Office |
| PS | Polling Station |
| PSC | Polling Station Committee |
| QR Code | Quick Response Code |
| SIEM | Security Information and Event Management |
| SL | Strategic lines |
| SMS | Short Message Service |
| WBS | Work Breakdown Structure |



2 Executive summary

Minsait is pleased to present this **Action Plan** designed to deliver the overall Strategy to Improve the Integrity, Transparency and Efficiency of the Electoral Process in BiH.

The Strategy and Action Plan is one of the four outcomes of the project *EU Support of a BiH Strategy and Action Plan to Improve the Integrity, Transparency and Efficiency in the Electoral Process*, and is comprised of **Part 1 - the Strategy Outline**, and **Part 2 - the Action Plan**.

The project was conceived to support CEC in becoming a professional electoral management body with an outstanding reputation for integrity in delivering election services.

The Strategy and Action plan provides the roadmap for CEC to achieve this goal through a five-year programme by working along four strategic lines:

- Organizational framework and performance assessment
- Staffing availability and readiness. Abilities development and talent retention plans
- Service delivery. Quality of elections data and integrity of the voting and counting processes
- Continuous improvement model and the role in democracy enhancement

When designing this Action Plan, the Minsait project team understood that there is a need to show progress to voters and stakeholders as fast as possible. Therefore, we took the decision of giving priority to those parts of the Strategy that would enable an efficient implementation and demonstrate better elections services to stakeholders very rapidly.

Another decision was the design of the plan in stages (tranches) around the two election events in the five-year period. Election events are when progress can best be demonstrated to the public.

Additionally, this staged approach would enable the balanced delivery of incremental functional and non-functional requirements of the systems in the Strategy and the opportunity to enhance them with end-user improvements, while also guaranteeing that CEC maintains election business continuity at all times.

We have planned four tranches in the five-year period. Each one will have a primary focus as follows:

- The **first tranche** would involve the delivery and implementation of a solution that provides the full workflow to be able to produce accurate and fast elections results. It will involve:
 - Processes map and organisational aspects
 - Nominations system
 - Electronic pollbook
 - Voting/Counting machines
 - Polling Stations Central Monitoring System
 - Collation, consolidation and generation of results System
- The **second tranche** will provide the voters register management function. It will involve:
 - Central Voters Register
 - On-line ballot delivery
 - Polling Station Management System (GIS)
- The **third tranche** will focus on the next deployment the systems for election day and development of the MECs/CEC count centres support.
- The **fourth tranche** will set the grounds for ensuring sustainability of the progress achieved.

To facilitate the delivery aspects of the Action Plan, we have grouped the **39 Action Lines in the Strategy** into **seven projects** according to priorities and dependencies between Action Lines. The seven projects are:

- Project 1 – Introducing organisational efficiency
- Project 2 – Implementation of information systems to ensure integrity of election results data
- Project 3 - Implementation of voting/counting technology at polling stations
- Project 4 – Improving the quality of elections databases and facilitate out-of-country voting
- Project 5 – Human resources management and support to logistics processes
- Project 6 – Implementation of information systems to improve transparency
- Project 7 – Facilitating the workflow of the complaints and appeals processes



The seven projects will be delivered across the four tranches with an **incremental functionality approach**.

This arrangement of projects implementation timeframe into tranches with incremental functionalities will enable CEC to develop a multiannual budget planning, which would support the implementation of the full strategy over the five-year period. CEC will also be able to manage the use of resources more efficiently and to build election organisation capabilities with a long-term perspective thus ensuring sustainability of the progress achieved.

On the budget necessary to deliver the Action Plan, we are providing our best estimate based on market research and experience. This budget should be considered a broad approximation that need to be further fine-tuned but that could be used as a starting point when addressing the funding aspects of the delivery of the Strategy.

Finally, we acknowledge that CEC have limited resources and lack enough staff members and specialised profiles to successfully deliver the entire five-year Action Plan in-house, while concurrently running their day-to-day operations. Therefore, some of the projects in the Action Plan will need the support of external suppliers to provide the technology and skills necessary to develop and deploy them. Other projects could be delivered directly by CEC with a reinforced organisation including extra project managers and technologists.

The five-year Strategy and Action Plan has been developed around the values of electoral integrity through quality and professionalism and we hope it will assist CEC in achieving operational excellence to consistently delivering trusted, reliable and high integrity electoral services in BiH.



3 Methodology

The Strategy to improve the integrity, transparency, efficiency of elections in BiH, is structured around four Strategic Lines, each one having a series of Action Lines to deliver their objectives:



SL1. Organizational framework and performance assessment
No. of Action Lines: 7



SL2. Staff availability and readiness. Abilities development and talent retention plans
No. of Action Lines: 6



SL3. Service delivery. Quality of elections data and integrity of the voting and counting processes
No. of Action Lines: 19



SL4. Continuous improvement model and the role in democracy enhancement
No. of Action Lines: 7

Figure 1 - The four Strategic Lines in the five year Strategy and the number of Action Lines to deliver them

In total, there are **39 Action Lines** categorised according to their scope of application: **Operations Transformation, ICT (technology) or Change Management.**

The Minsait project team has based the design of the work plan to deliver these 39 Action Lines on the following principles:

1. **Prioritise** the action lines to enable an efficient implementation and show progress to stakeholders very rapidly. This way the Action Plan will act as tool to build confidence and public support for the CEC Strategic Plan implementation from the start.
2. Bundle Action Lines into **projects** according to priorities and dependencies between Action Lines. The use of project management methodologies will enable CEC to standardise, structure, and organize the work and introduce efficiencies in the delivery of the Action Plan
3. Arrange the projects implementation timeframe in stages (**tranches**) around the two election events in the five-year period. The approach is to deliver each project through an **incremental functionality** implementation per tranche. This staged approach will enable the balanced delivery of functional and non-functional requirements and the opportunity for incorporating end user improvements.

The arrangement of the projects implementation timeframe into tranches with incremental functionalities will enable CEC to develop a multiannual budget planning, which would support the implementation of the full strategy over the 5 years period. CEC will also be able to manage the use of resources more efficiently and to build election organisation capabilities with a long-term perspective thus ensuring sustainability of the progress achieved.



4 Priority areas

The Minsait project team recommends to give priority in the Action Plan to the following three areas:

4.1 Processes

The re-design of processes, clear definition of roles and responsibilities and accountabilities may not have high public exposure but will set the grounds for an efficient implementation of all other actions in the Strategy. Therefore, this area should be given high priority in the Action Plan.

4.2 Technology at polling stations

For the majority of voters, polling stations are the main point of contact with the elections administration. Technology at polling stations will improve the efficiency of operations and the integrity of the voting and counting processes. Moreover, improving Election Day operational performance will help CEC to foster their communication strategy and rebuilt credibility.

The above rationale is supported by the conclusions of the public survey carried out at the beginning of this project. The survey showed that electronic voting is identified by a high percentage of voters as the way to improve the elections process.

Question: what elements would you change in order to improve the way in which the election process works? Open ended question

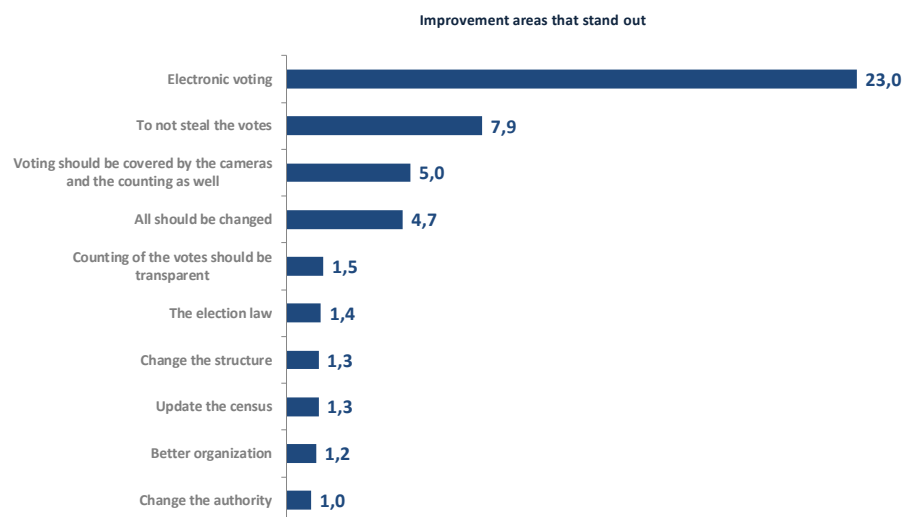


Figure 2 - Public survey report on identification areas of improvements

Therefore, we recommend that the Actions Lines related to the introduction of technology at polling stations be prioritised.

4.3 Quality of the voters register

The OSCE/ODIHR BiH elections observation reports recurrently highlight stakeholders concerns around the Central Voters Register (CVR) accuracy.

We understand accuracy of the CVR depends on the quality of source data, which is a CEC responsibility for out-of-country voters but is not for in-country voters. The quality of source data is a complex issue as it involves different national, entity and local bodies each one having a different responsibility in the gathering and update of citizens data.

Still, the Strategy lays out a number of Action Lines related to the redesign and update of the CVR functionalities and technical platform, which would dramatically improve accessibility of the vote, reduction of



administrative costs, prevention of fraud and irregularities, and reduction of polling place congestion leading to long lines on Election Day.

This is why we recommend that the Action Lines dealing with CVR improvements should be given a high priority in this Action Plan.



5 The projects

The Action Lines implementation has been organised into **seven projects** taking into consideration priorities and dependencies between Action Lines. The following are the projects and their focus:

| | |
|--|---|
| <p>Project 1 – Introducing organisational efficiency</p> | <ul style="list-style-type: none"> • Focus on the review/redesign of processes, roles & responsibilities and accountabilities to obtain the CEC processes map. • Introduction of project management methodology and tools to standardise, structure, and organize the work. • Development of processes, KPIs and supporting tools for performance monitoring and continuous improvement. • This project takes also on board all the Action Lines related to the planning, design and coordination of activities oriented to change management and the promotion of democratic values. |
| <p>Project 2 – Implementation of information systems to ensure integrity of election results data</p> | <ul style="list-style-type: none"> • Focus on the introduction of technology at polling stations (Electronic Pollbooks) to fast transmit the preliminary results into a results consolidation central system while guaranteeing integrity of data • This project will implement the information systems to ensure the same quality standards of service delivery at polling stations across the country by enabling monitoring of operations during election day through the Electronic Pollbooks • The project will also deliver the information systems to streamline the final count at central count centres (MECs and Central Count Centre in Sarajevo) |
| <p>Project 3 - Implementation of voting/counting technology at polling stations</p> | <ul style="list-style-type: none"> • Focus on the implementation of technology to streamline the voting, counting and generation of polling station results with full accuracy • This project complements Project 2 at introducing efficiencies at polling stations and improving voter's experience |
| <p>Project 4 – Improving the quality of elections databases and facilitate out-of- country voting</p> | <ul style="list-style-type: none"> • Focus on developing the tools to ensure integrity and highest possible accuracy of source election data: voter registration (out-of-country and in-country), polling locations and candidate nominations. |
| <p>Project 5 – Human resources management and support to logistics processes</p> | <ul style="list-style-type: none"> • Focus on the development of the methodology and tools for HR planning, resource allocation, temporary staff management and performance monitoring. • This project will guarantee the availability of qualified staff for elections delivery through the development of eLearning tools • The project will also develop a management system to streamline logistics operations |
| <p>Project 6 – Implementation of information systems to improve transparency</p> | <ul style="list-style-type: none"> • Development of tools for the elections administration to communicate better both internally (intranet to facilitate the information flow between CEC and MECs) and externally (corporate website and information portal for each election event). • This project will also implement the tools to provide post-election data analytics |



**Project 7 –
Facilitating the
workflow of the
complaints and
appeals processes**

- Focus on streamline the around the complaints and appeals processes and ensuring full traceability of documentation, decisions and resolutions

The following table provides the traceability between Strategic Lines and their corresponding Action Lines, to each of the seven projects outlined above. Please note that some of the Action Lines are implemented across more than one project:

| | | PROJECTS | | | | | | |
|--|---|----------|----|----|----|----|----|----|
| STRATEGIC LINES | ACTION LINES | P1 | P2 | P3 | P4 | P5 | P6 | P7 |
| SL1 - Organizational framework and performance assessment | SL1_OT1. Process oriented electoral organization | | | | | | | |
| | SL1_OT2. Roles, responsibilities and performance assessment | | | | | | | |
| | SL1_OT3. Project management focus | | | | | | | |
| | SL1_OT4. Definition of governance mechanisms | | | | | | | |
| | SL1_IT1. Performance monitoring system | | | | | | | |
| | SL1_IT2. Elections central monitoring system | | | | | | | |
| | SL1_CM1. Engagement with the new governance model | | | | | | | |
| SL2 - Staff availability and readiness. Abilities development and talent retention plans | SL2_OT1. Staffing capabilities and skills development roadmap | | | | | | | |
| | SL2_OT2. HR planning | | | | | | | |
| | SL2_OT3. Training planning | | | | | | | |
| | SL2_IT1. Human Resources Information System | | | | | | | |
| | SL2_IT2. E-learning solution | | | | | | | |
| | SL2_CM1. The creation of a shared meaning | | | | | | | |
| SL3 - Service delivery. Quality of elections data and integrity of the voting and counting processes | SL3_OT1. Improve logistics processes traceability | | | | | | | |
| | SL3_OT2 Streamline complains and appeals workflow | | | | | | | |
| | SL3_OT3 Voters register processes review | | | | | | | |
| | SL3_OT4 Selection of polling locations | | | | | | | |
| | SL3_OT5 Nominations processes review | | | | | | | |
| | SL3_OT6 Out-of-country voters registration and voting processes | | | | | | | |
| | SL3_OT7 Assessment of polling station workflows | | | | | | | |
| | SL3_OT8 Counting and results consolidation | | | | | | | |
| | SL3_OT9 Processes at the MECs and Central Count Centres | | | | | | | |
| | SL3_IT1. Logistics management system | | | | | | | |
| | SL3_IT2 Complaints and appeals process workflow | | | | | | | |
| | SL3_IT3 Update of the central voters register system | | | | | | | |
| | SL3_IT4 Polling station management system | | | | | | | |
| | SL3_IT5 Candidates nominations and registration system | | | | | | | |
| | SL3_IT6 Out-of-country voting workflow | | | | | | | |
| | SL3_IT7 Technology at the polling station | | | | | | | |
| SL3_IT8 Counting and results consolidation system | | | | | | | | |
| SL3_IT9 Technology in the MECs and Main Count Centres | | | | | | | | |



| STRATEGIC LINES | ACTION LINES | PROJECTS | | | | | | |
|--|---|----------|----|----|----|----|----|----|
| | | P1 | P2 | P3 | P4 | P5 | P6 | P7 |
| | SL3_CM1. Stakeholder engagement and adaptation to changes | | | | | | | |
| SL4 - Continuous improvement model and the role in democracy enhancement | SL4_OT1. Strategy assessment | | | | | | | |
| | SL4_OT2. Election delivery continuous improvement | | | | | | | |
| | SL4_IT1. Election analytics | | | | | | | |
| | SL4_IT2. Website enhancement | | | | | | | |
| | SL4_IT3. Voters support line | | | | | | | |
| | SL4_CM1. Promotion of democratic values | | | | | | | |
| | SL4_CM2. Uphold the reputation of the CEC | | | | | | | |

Table 1 - Action Lines in each of the seven projects in the five-year planning

From the perspective of ITC, the following table provides the details of the IT Systems in the Strategy that will be delivered under each project in the Action Plan:

| PROJECT IN THE ACTION PLAN | IT SYSTEM | RELATED ACTION LINES | DESCRIPTION |
|--|---|---|---|
| Project 1 – Introducing organisational efficiency | Intranet | SL1_IT1. Performance monitoring system | A permanent internal portal will channel communications and access to information system from CEC and MECs staff. |
| | Document Management System (DMS) | SL1_IT1. Performance monitoring system | Necessary to store, manage and track electronic and paper-based scanned documents |
| | Project management tools | SL1_IT1. Performance monitoring system | To facilitate the project planning, execution, monitoring and control, and closure processes |
| Project 2 – Implementation of information systems to ensure integrity of election results data | Polling Stations Central Monitoring System | SL1_IT2. Elections central monitoring system | Dashboard with KPIs to: <ul style="list-style-type: none"> Monitor the progress of the poll at polling stations Receive turnout rates during election day Receive preliminary results from polling stations Additionally, there will be call centres to support the resolution of issues |
| | Electronic pollbooks | SL3_IT7 Technology at the polling station | Used at polling stations to identify voters, check eligibility-to-vote, report on the progress of polling day including issues/incidents and turnout plus preliminary results transmission |
| | MECs and Main Count Centres Support Systems | SL3_IT9 Technology in the MECs and Main Count Centres | To streamline the verification, counting and production of aggregated results at the MECs and Main Counting Centres |
| | Collation, consolidation and generation of results System | SL3_IT8 Counting and results consolidation system | To consolidate results per election type and make elections results publically available through multiple channels. A set of tools to report and facilitate analysis of count and turnout data |
| Project 3 – Implementation of voting/counting technology at polling stations | Voting machines - Ballot generator or scanners | SL3_IT7 Technology at the polling station | To cast and automatically count votes at polling stations and produce results at the close of polls |
| Project 4 – Improving the quality of elections databases and facilitate out-of-country voting | Polling Station Management System | SL3_IT4 Polling station management system | GIS ¹ based solution to select and manage polling locations and associated streets, registration and constituency data associated with election activities |
| | Voters Register System | SL3_IT3 Update of the central voters register system | Central Voters Register technology update to enable more tools to guarantee data integrity and quality |

¹ Geographic Information System



| PROJECT IN THE ACTION PLAN | IT SYSTEM | RELATED ACTION LINES | DESCRIPTION |
|---|---|--|---|
| | Nominations System | SL3_IT5 Candidates nominations and registration system | To facilitate candidacies nomination process and ballot paper generation & statutory communications |
| | Online Ballot Delivery | SL3_IT6 Out-of-country voting workflow | Solution proposed to streamline and secure the eligibility and voting process of the voters registered abroad |
| Project 5 – Human resources management and support to logistics processes | Logistics Support System | SL3_IT1. Logistics management system | To facilitate the logistics cycle of elections material including sensitive and non-sensitive material |
| | Temporary Human Resources Management System | SL2_IT1. Human Resources Information System | To manage the recruiting processes, payroll management, attendance tracking, performance reviews, and the overall maintenance of the temporary staff records while working for the elections. |
| | e-Learning Platform | SL2_IT2. E-learning solutions | To support the training programme |
| Project 6 – Implementation of information systems to improve transparency | Corporate website | SL4_IT2. Website enhancement | The corporate website will be redesigned, including an election portal, a blog, a transparency section |
| | Elections Portal | SL4_IT2. Website enhancement SL4_IT3. Voters support line | A public informational web portal to function as an information hub for the information relevant to the election process |
| | Post elections results analytics | SL4_IT1. Election analytics | This will include the analytics tools to review elections processes data and performance |
| Project 7 – Facilitating the workflow of the complaints and appeals processes | Complains and Appeals Management System | SL3_IT2 Complaints and appeals process workflow | To manage complains and appeals at MEC and CEC level |

Table 2 - IT Systems per project in the five-year planning



6 Implementation framework

The **implementation framework** of the seven projects will be organised into **tranches**. One tranche is a period of time in which a set of functionalities of different projects will be developed and delivered.

Assuming that the launch of the Action Plan will take place at the **beginning of a non-election year**, we have divided the five-year Action Plan into **four tranches**. Each one will have a primary focus as follows:

- The **first tranche** would involve the delivery and implementation of a solution that provides the full workflow to be able to produce accurate and fast elections results. It will involve:
 - Processes map and organisational aspects
 - Nominations system
 - Electronic pollbook
 - Voting/Counting machines
 - Polling Stations Central Monitoring System
 - Collation, consolidation and generation of results System
- The **second tranche** will provide the voters register management function. It will involve:
 - Central Voters Register
 - On-line ballot delivery
 - Polling Station Management System (GIS)
- The **third tranche** will focus on the next deployment of the systems for election day and development of the MECs/CEC count centres support
- The **fourth tranche** will set the grounds for ensuring sustainability of the progress achieved.

The tranches have been planned around the two elections events that will take place during the five-year period. The reason being that the deployment of technology at polling stations will be phased across the two elections events. This way the transition from a fully manual to a fully automated polling station will be scaled up across a minimum of two/three elections.

This planning facilitates risks control and allows for feedback and lessons learned to be gathered to improve the final functionality and operational approach. Additionally, the deployment plan can be fine-tuned to ensure 100% success with the nation-wide rollout. We recommend start with 20% of polling stations at the first election event up to a full roll-out on the second or third.

Finally for some time, the new technology will coexist with the existing one and both will have to be integrated to deliver the full election.

The proposed duration of each tranche is as follows:

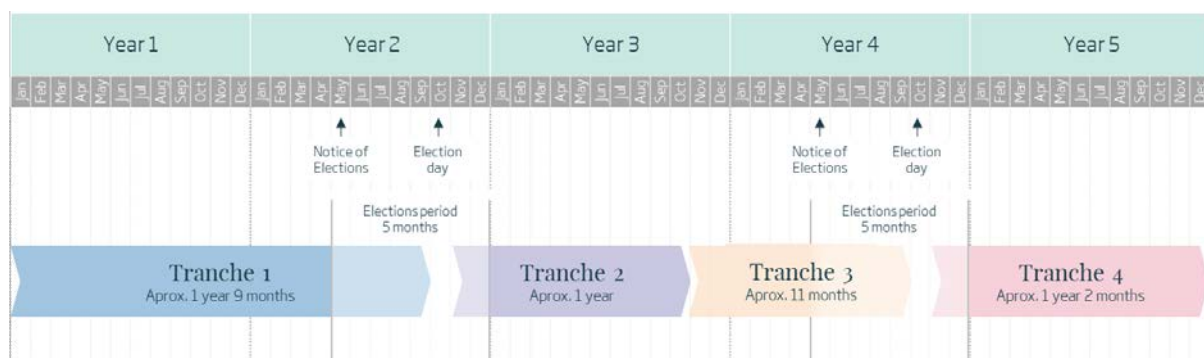


Figure 3 - The four tranches in the Action Plan



The seven projects will be developed and delivered over the four tranches and they will implement incremental functionalities and, for the case of projects 2 and 3, phased deployment of polling station technology in each Tranches 1 and 3.

The following is the top-level diagram of projects vs. tranches:

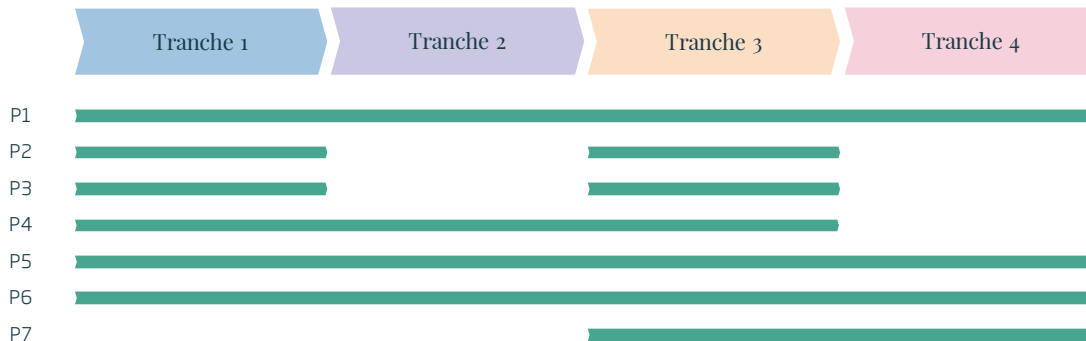


Figure 4 – Top level projects implementation planning

Each tranche will have four phases:

- **Analysis:** This first stage will consist of the analysis of the functional and technical requirements of the systems to be developed in the different projects. The outcome would be a defined AS IS sets of requirements (current) and a defined TO BE set of requirements (final)
- **Development:** This stage covers the development and implementation of the requirements of each of the projects. As in the analysis stage, all projects will run in parallel during this stage.
- **Integration, tests and compliance:** This stage will work for integrating the different projects, testing their dependencies and their functioning and ensuring the advancements in all projects at his stage comply with the quality standards defined in the analysis stage.
- **Deployment and engaging:** During this last stage, all changes developed in the earlier stages will be deployed in a coordinated way in order to ensure availability of all the capacities of the elections administration. This stage will also comprise the activities needed to ensure the rightful adaptation of the electoral organization to the changes, including training, communications and other change management activities.

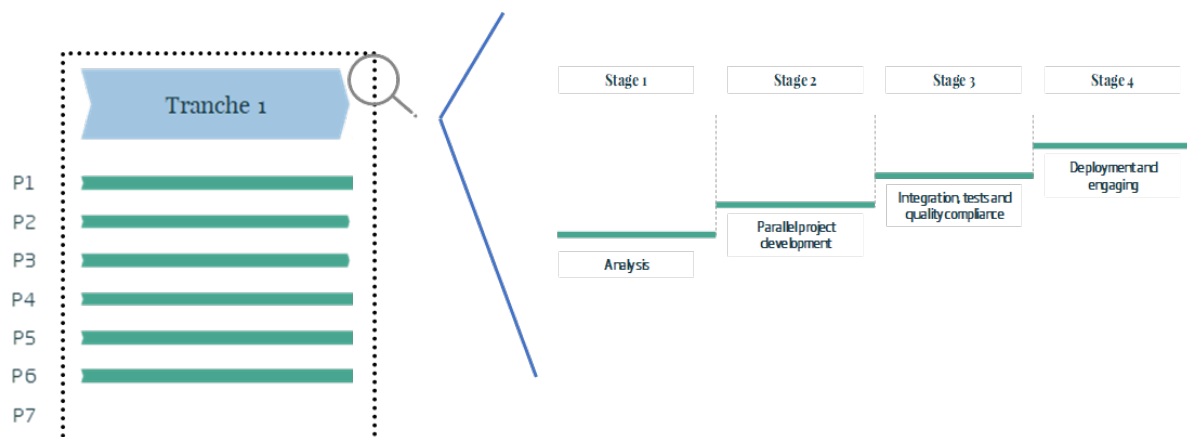


Figure 5 - Tranche development stages



6.1 Functionality per Tranche

The following tables detail the functionality that is to be developed and delivered per project for each of the four Tranches.



6.1.1 Tranche 1

| PROJECT | FUNCTIONALITY IN TRANCHE 1 |
|--|--|
| Project 1 – Introducing organisational efficiency | <ul style="list-style-type: none"> • Definition of the processes map, roles & responsibilities and accountabilities. • Design of processes for performance measurement and gathering feedback • Production of plan activities for keeping engagement with stakeholder and keep building the transparency organisation culture. Delivery of the activities in the plan • Design and delivery of the plan of activities to perform awareness, coaching and training of CEC/MECs staff on the new process and systems and organisational culture. • Design and delivery of the training content adapted to the eLearning platform • Coordination with activities which are part of the Communications Plan |
| | <p>Project Management tools:</p> <ul style="list-style-type: none"> • Outline of basic methodology for project management (planning, execution, monitoring, reporting and risks) • Selection and configuration of the commercial application that provides the basic tools to support the methodology (planning, milestones and deliverables, costs control, risks management) • Risks identification and classification according to the approved risk catalogue • Execution: <ul style="list-style-type: none"> - Monitoring of tasks completion and milestone achievement - Risks update and review |
| | <p>Intranet:</p> <ul style="list-style-type: none"> • Service through secure network (current implementation) or on Cloud • Navigation and accessibility design • Access and permissions • Management of information flows and tasks between CEC and MECs • Shared calendar • Notifications and automatic alarms |
| | <ul style="list-style-type: none"> • Design and implement activities to engage stakeholders to promote democratic values • Coordination with activities which are part of the Communications Plan |



| PROJECT | FUNCTIONALITY IN TRANCHE 1 |
|---|---|
| Project 2 - Implementation of information systems to ensure integrity of election results data | <ul style="list-style-type: none"> • Review and update/redesign of polling station workflows and administrative forms <p>Electronic pollbook functionality:</p> <ul style="list-style-type: none"> • Database design and procedures to upload/configure the devices • Implementation of procedures at polling stations (open/close election...) • Voter identification through approved documents (ID, drivers license ...) or direct search • Implementation of eligibility checks • Production of tokens for voting machines (if required) • Functionality to transmit count results • Communications protocol with the central system to report on progress of election day (turn out) • Production of reports and export data • Data encryption and security features • Audit logs <p>Polling Stations Central Monitoring System:</p> <ul style="list-style-type: none"> • Database design • Communications module to receive information on turn out from Electronic Pollbooks at polling stations • Workflow of issues • Automatic alarms • Reporting module and dashboards for MECs/CEC and public reporting • Data encryption and security features • Audit logs • Partial deployment for first election event (suggested 1/3 of polling stations) |



| PROJECT | FUNCTIONALITY IN TRANCHE 1 |
|---|---|
| | <ul style="list-style-type: none"> • Review and update/redesign of counting procedures (polling stations/MECs and CCC in Sarajevo count centres) and administrative forms <p>Collation, consolidation and generation of results System:</p> <ul style="list-style-type: none"> • Database design • Communications module to receive results from polling stations (Electronic Pollbooks) • Integration of results from central count centres (MECs and CCC in Sarajevo) • Data integrity checks • Issues workflow • Productions of results at different aggregation levels • Algorithms to apply electoral law to allocate seats • Reporting of results via CEC website/elections portal • Data encryption and security features • Audit logs |
| <p>Project 3 - Implementation of voting/counting technology at polling stations</p> | <p>Development of the full functionality of the chosen technology:</p> <ul style="list-style-type: none"> • Implementation of open/close polls and counting procedures • Machine activation mechanism (token) • Generation of paper receipt with a QR code • Generation of results with QR codes • Data encryption and security features • Audit logs • Call centres for support and issues resolution • Partial deployment for first election event (suggested 1/3 of polling stations) |
| <p>Project 4 - Improving the quality of elections databases and facilitate out-of- country voting</p> | <ul style="list-style-type: none"> • Review and update/redesign of candidate nominations workflows and administrative forms and documentation <p>Nominations system:</p> <ul style="list-style-type: none"> • Database design • On-line candidate pre-registration • Registration documents digitalisation • Interface between candidates nominations system and voters register • Process traceability and workflow management • Production of legal forms and reports • Generation of ballot papers images • Possibility of automatic notifications to candidates |



| PROJECT | FUNCTIONALITY IN TRANCHE 1 |
|--|--|
| | <ul style="list-style-type: none"> • Digital signature, data protection and security features • Audit logs |
| <p>P5 - Human resources management and support to logistics processes</p> | <p>HR information system (available to CEC and MECs): Selection and configuration of the commercial application that provides the basic tools to support the following functionality:</p> <ul style="list-style-type: none"> • Import polling stations information • Production of forecast of temporary staff that will be required • Production of digital forms for data capture • Functionality for performance evaluations of temporary staff • Possibility to upload information about training itineraries, skills development and results of the performance evaluation • Possibility to implement workflow of approval/rejection of staff • Documents digitalisation • Possibility of automatic notifications to individuals/parties • Integrated control panel and dashboards • Automatic alarms • Reports generation • Digital signature, data protection and security features • Audit logs <p>E-learning platform: Selection and configuration of the commercial application that provides the basic tools to support the following functionality</p> <ul style="list-style-type: none"> • Management of training documentation. • Creation of work groups. • Student assessment and course completion tracking |
| <p>Project 6 – Implementation of information systems to improve transparency</p> | <p>CEC website:</p> <ul style="list-style-type: none"> • Service on Cloud • Navigation and accessibility design including responsive design • Content management functionality • Transference of content from current website • Service continuity • Use of Content Delivery Network service during elections period <p>Note: development of website content and procedures for content management are part of the scope of the Communications Plan</p> |



| PROJECT | FUNCTIONALITY IN TRANCHE 1 |
|---------|---|
| | <p>Elections portal:</p> <ul style="list-style-type: none"> • Service on Cloud • Navigation and accessibility design including responsive design • Content management functionality • Service continuity • Use of Content Delivery Network service during elections period <p>Note: development of the portal content and procedures for content management are part of the scope of the Communications Plan</p> |

Table 3 - Tranche 1 functionality



6.1.2 Tranche 2

| PROJECT | FUNCTIONALITY IN TRANCHE 2 |
|--|--|
| Project 1 – Introducing organisational efficiency | <ul style="list-style-type: none"> • Collection and analysis of Tranche 1 feedback from stakeholders and lessons learned • Production of reports on assessment of implementation and performance of projects implemented in Tranche 1 • Production of proposed improvements on systems delivered in Tranche 1 • Review and adjustment (if required) of Strategy and Action Plan for next Tranches • Collection of feedback form MECs and CEC staff to review and propose enhancements on project management methodology • Review and refinement of processes map and supporting documentation • Production of a plan of activities for keeping engagement with stakeholder and keep building the transparency organisation culture. Delivery of the activities in the plan • Explore the possibility of reaching cooperation agreements with educational institutions and jointly develop an activities plan to contribute to democracy enhancement in BiH • Update (with feedback from Tranche 1 performance reports) and further delivery of the plan to perform awareness, coaching and training of CEC/MECs staff on the new process and systems and organisational culture. • Additional development of training content adapted to the eLearning platform • Coordination with activities which are part of the Communications Plan <p>Project Management tools:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports <p>Implementation/configuration of further functionality:</p> <ul style="list-style-type: none"> • Monitoring: <ul style="list-style-type: none"> - Dashboard of project status indicators. - Change management. - Costs monitoring and analysis. • Control: <ul style="list-style-type: none"> - Deviations analysis. - Monitoring of alerts. - General reports. • Close: <ul style="list-style-type: none"> - Generation of project evaluation report. |



| PROJECT | FUNCTIONALITY IN TRANCHE 2 |
|---|--|
| | <p>Document Management System (DMS) Selection and configuration of the commercial application that provides the basic tools to support the following functionality</p> <ul style="list-style-type: none"> • Document management workflow • Approval of documentation workflow • Migration of document repository to new environment |
| Project 4 - Improving the quality of elections databases and facilitate out-of-country voting | <p>Central Voters Register:</p> <ul style="list-style-type: none"> • Review of current CVR compilation processes. Definition of roles and tasks to facilitate tracking of registration, modification and deregistration data. • Review and update of interfaces with IDDEEA platform • Review and update of current processes for registration of out-of-country voters • Technology update of the current CVR platform and development of new functionality such as the integration of the CVR (Central Voters Register) and the VRC (Voter Registration Centre) in a single technology platform to be used by CEC and MECs. • Export facilities for communication of VRC collected data to IDDEEA • Implementation of automatic data integrity checks and reports • Implementation of possible automatic interfacing with Ministry of Foreign Affairs databases of citizens registered abroad and updates on deceased citizens • Functionality for implementation of registration of out-of-country voters workflow, upload of documentation and guarantee quality and integrity of data. Generation of the communications workflow (email/SMS) with voters to solve anomalies • Generation of automatic alerts as part of the data verification process • Production of system reports • Data encryption and security features • Audit logs <p>Online ballot delivery (out-of-country voters accessibility of the vote)</p> <ul style="list-style-type: none"> • Authentication and user access • Full functionality implementation • Eligibility checks • Online user support • Statistics and reports • Workflow of processing of postal packs when received at CEC • Tracking system for processing status of received postal pack • Automatic alarms • Reports generation • Data protection and security features • Audit logs |



| PROJECT | FUNCTIONALITY IN TRANCHE 2 |
|---|---|
| | <p>Polling Station Management System:</p> <ul style="list-style-type: none"> • Minimum standards for polling places • Upload of polling centres historic database and classification according to standards • GIS minimum functionality to select a polling centre and allocated streets • Interface with voters register to produce voters lists per polling station • Issues workflow • Reports generation • Data protection and security features • Audit logs |
| <p>P5 - Human resources management and support to logistics processes</p> | <p>E-learning platform:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Implementation/configuration of further functionality such as: <ul style="list-style-type: none"> - Notifications to the students by e-mail or sms. - Forums and chats to encourage participation. - Real time monitoring of students activity - Reports and statistics related to: registered students, degree of progress of the course, result of the evaluation, number of attempts made, connection time, etc. |

Table 4 - Tranche 2 functionality



6.1.3 Tranche 3

| PROJECT | FUNCTIONALITY IN TRANCHE 3 |
|---|---|
| Project 1 – Introducing organisational efficiency | <ul style="list-style-type: none"> • Collection and analysis of Tranche 2 feedback from stakeholders and lessons learned • Production of reports on assessment of implementation and performance of projects implemented in Tranche 2 • Production of proposed improvements on systems delivered in Tranche 2 • Review and adjustment (if required) of Strategy and Action Plan for next Tranches • Review and refinement of processes map and supporting documentation • Production of a plan of activities for keeping engagement with stakeholder and keep building the transparency organisation culture. Delivery of the activities in the plan • Update (with feedback from Tranche 2 performance reports) and further delivery of the plan to perform awareness, coaching and training of CEC/MECs staff on the new process and systems and organisational culture. • Additional development of training content adapted to the eLearning platform • Coordination with activities which are part of the Communications Plan |
| Project 2 – Implementation of information systems to ensure integrity of election results data | <p>Electronic pollbook functionality:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Implementation of advanced functionalities: <ul style="list-style-type: none"> - Automatic transmission of information to the central servers on status of the equipment (malfunctioning reporting, statistics on usage, alarms) - Functionality to use EPBs to report on logistics issues (material received at polling stations and cross checks with plan packing lists, alarms of shortage of ballot papers) - Data encryption and security features - Audit logs • Nation-wide deployment of the Electronic Pollbook solution for the elections <p>Polling Stations Central Monitoring System:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Implementation of advance functionality to receive and process continuous information from EPBs at polling stations • Implementation of issues workflows • Configuration and technical support during election period • Data encryption and security features • Audit logs • |



| PROJECT | FUNCTIONALITY IN TRANCHE 3 |
|---|--|
| | <p>Collation, consolidation and generation of results System:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Multichannel reporting of results (mobile apps) • Data encryption and security features • Audit logs • Solution configuration and technical support during election period <hr/> <p>MECs and Main Count Centres Support Systems:</p> <ul style="list-style-type: none"> • Database design • Implementation of functionality workflows including re-counts • Implementation of authorisation workflows • Interfacing with the Collation, consolidation and generation of results System to automatically upload data and consolidate results • Issues workflow implementation • Data integrity checks • Interface with Central Voters' Register to check voters' eligibility and to prevent duplication of votes (votes in envelopes). • Reports on results at polling stations level • Data encryption and security features • Audit logs |
| Project 3 - Implementation of voting/counting technology at polling stations | <p>Voting/counting technology:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Nation-wide deployment for the elections |
| Project 4 - Improving the quality of elections databases and facilitate out-of-country voting | <p>Nominations system:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Provide technical support during election period |
| P5 - Human resources management and | <p>HR information system (available to CEC and MECs):</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports |



| PROJECT | FUNCTIONALITY IN TRANCHE 3 |
|---|---|
| support to logistics processes | <ul style="list-style-type: none"> • Configuration of workflows for accreditation and management of local and international observers <hr/> <ul style="list-style-type: none"> • Review and update/redesign of current logistics procedures and administrative forms <p>Logistics support system: Selection and configuration of the commercial application that provides the basic tools to support the implementation of workflows for:</p> <ul style="list-style-type: none"> • Order management • Warehouse management • Shipment management • Returns management |
| Project 6 – Implementation of information systems to improve transparency | <p>CEC website:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 2 performance reports • Use of Content Delivery Network service during elections period <p>Note: development of website content and procedures for content management are part of the scope of the Communications Plan</p> <hr/> <p>Elections portal:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 1 performance reports • Use of Content Delivery Network service during elections period <p>Note: development of the portal content and procedures for content management are part of the scope of the Communications Plan</p> |
| Project 7 – Facilitating the workflow of the complaints and appeals | <ul style="list-style-type: none"> • Review and update/redesign of the complaints and appeals workflows and administrative forms and documentation • Database design • Web application to register a complaint/appeal • Upload of related documents • Process traceability and workflow management • Implementation of the response workflow • Production of legal forms and reports • Digital signature, data protection and security features • Audit logs |

Table 5 - Tranche 3 functionality



6.1.4 Tranche 4

| PROJECT | FUNCTIONALITY IN TRANCHE 4 |
|---|--|
| Project 1 – Introducing organisational efficiency | <ul style="list-style-type: none"> • Collection and analysis of Tranche 3 feedback from stakeholders and lessons learned • Production of reports on assessment of implementation and performance of projects implemented in Tranche 3 • Production of proposed improvements on systems delivered in Tranche 3 • Final review and refinement of processes map and supporting documentation • Production of a plan of activities for keeping engagement with stakeholder and keep building the transparency organisation culture. Delivery of the activities in the plan • Keep developing relationships with educational institutions and jointly develop an activities plan to contribute to democracy enhancement in BiH • Update (with feedback from Tranche 3 performance reports) and further delivery of the plan to perform awareness, coaching and training of CEC/MECs staff on the new process and systems and organisational culture. • Additional development of training content adapted to the eLearning platform • Coordination with activities which are part of the Communications Plan |
| P5 - Human resources management and support to logistics processes | <p>Logistics support system:</p> <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 3 performance reports <p>Configuration of further functionality:</p> <ul style="list-style-type: none"> • Monitoring and reporting • Data export • Traceability tools • Delivery times monitoring • Documentation management |
| Project 6 – Implementation of information systems to improve transparency | <p>Elections data analytics:</p> <ul style="list-style-type: none"> • Compile historic database of elections results • Standardise and integrate all information • Develop tools to graphically display statics on results and facilitate analysis • Generation of reports |
| Project 7 – Facilitating the workflow of the | <ul style="list-style-type: none"> • Implementation of enhancements identified in Tranche 3 performance reports <p>Development of further functionality:</p> <ul style="list-style-type: none"> • Automatic alerts sent via SMS/email |



| PROJECT | FUNCTIONALITY IN TRANCHE 4 |
|------------------------|---|
| complaints and appeals | <ul style="list-style-type: none"> • Dashboard with statistics (parties/candidates/individuals aggregated data per MEC, taxonomy of complaints, current status, resolutions) • Publication of the resolutions of the complaints. • Production of reports and statistics. |

Table 6 - Tranche 4 functionality



7 Technology at polling stations

This section discusses the technology that is proposed in the Strategy and Action Plan to make polling places more efficient, data and results accurate while guaranteeing full integrity.

There are three main processes at polling stations on Election Day that technology can fulfil:

1. Provide the solution to check eligibility to vote
2. Provide the solution to facilitate the vote and the count of the votes
3. Provide the solution for the results of the votes cast to be available centrally and verified for accuracy

The Strategy and Action Plan is based on **Electronic Pollbooks** to fulfil **processes 1 and 3**, and **Voting (Ballot Generator) or Counting machines (Scanning Machine)** to fulfil **process 2**.

The workflow at polling station varies depending on whether Ballot Generators or Scanning Machines are in used.

Procedures on Election Day (open/close of polls, checking voters eligibility, generation of results and transmission of results) on any of the three machines are safeguarded by PS member user credentials. These credentials varied between machines. They can be a username plus PIN, a smartcard plus PIN or a barcode plus PIN.

In the case of the Ballot Generator, voting is safeguarded by a token that is given to the voter after their eligibility is checked at the Electronic Pollbook. The token in the recommended implementation for BiH is a QR code generated by the Electronic Pollbook.

There is no token in the case of the Scanning Machines. To prevent unauthorised casting of ballots, the machine is activated by a PS member for each voter.

Scanning Machines have shown some accuracy issues when interpreting marks on the ballot papers. To avoid these issues, some suppliers offer now a functionality to query voters about over votes, under votes, blank ballots, and other situations. Voters can then verify that their votes will be counted as they intended. The interface is provided on a small screen. This implementation provides better accuracy when counting the votes but increases the time to cast the vote, therefore more units are required at polling stations in order to prevent queues.

To maximise efficiency, security and costs, we recommend that just Electronic Pollbooks have transmission capabilities. Neither the Ballot Generator nor the Scanning Machines, should have a connection to the outside world. This is a basic security feature. On close of polls, results are tallied and stored in the machines internal memories and a printed copy of the results is produced. We recommend that a QR code is printed on the results slip containing the tallied results for all the elections. The QR can be read by the Electronic Pollbook and results sent to the central servers.

During Election Day, information on interim turnout figures, or confirmation on opening/closing of the polls, is sent from the Electronic Pollbooks to the central servers.

This way the Electronic Pollbooks will deliver there functions:

- Checking voters eligibility to vote
- Reporting on progress of election day (interim turn-out, open/close of polls..)
- Transmit results to the central servers

7.1 The Polling Station workflow – Electronic Pollbook plus Ballot Generator Machine

The Electronic Pollbook and the Ballot Generator Machine are integrated in the polling station workflow as follows:

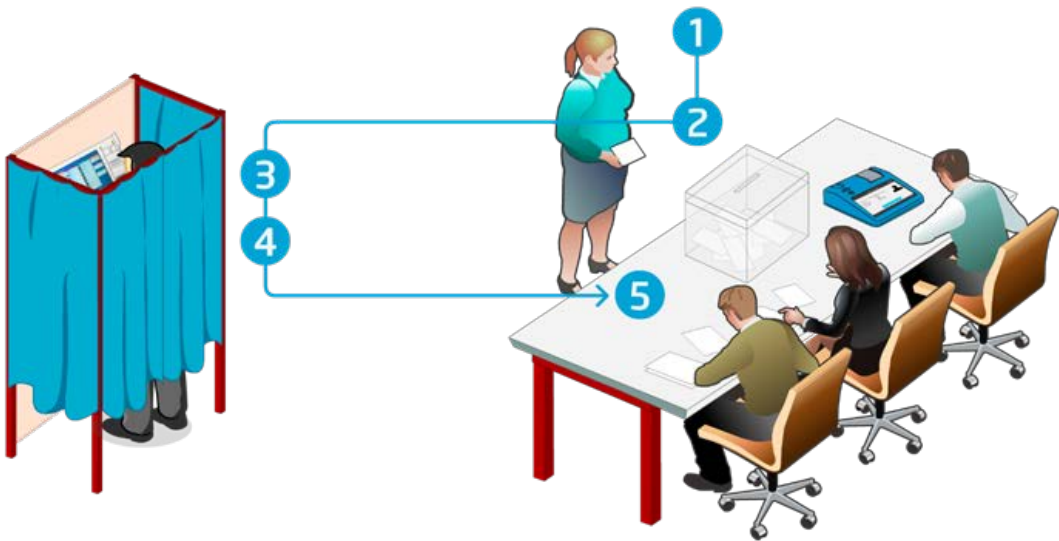
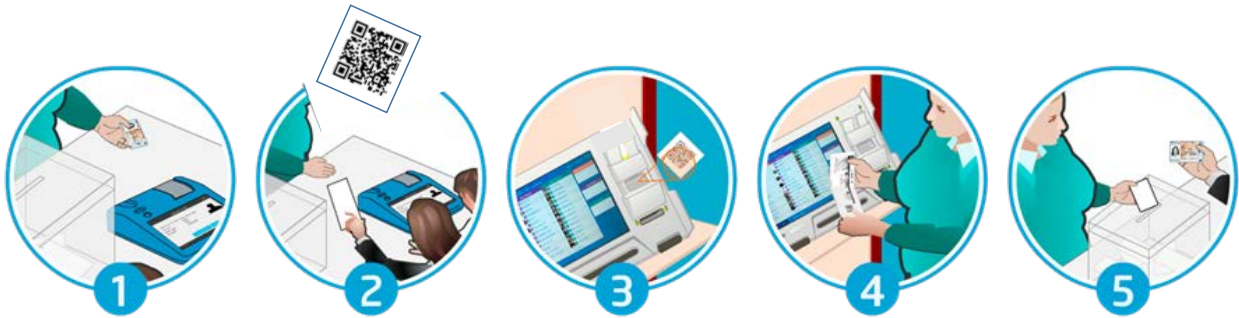


Figure 6 - Polling station workflow: EPB + Ballot Generator



Voter hand in their ID card to the PS member.

Barcode on ID is scanned by the EPB and PS member checks voter's details and eligibility status on the screen of the EPB.

EPB prints the token to access the voting machine. The Token is a unique QR barcode.

The Token is not linked to voters identity

Voter goes to the voting booth and scans the Token.

The application guides the voter through the selection of choices and confirmation of the vote, providing multiple opportunities to review vote.

The voting workflow is provided in both audio and visual formats (for the visually impaired).

The solution protects against over votes and can alert the voter in case of under votes

The machine prints a receipt slip with the votes cast.

The receipt is put in the ballot box before the ID is returned to the voter by the PS member



On close of polls, the EPB and the Ballot Generator are switched to “polls closed” mode by the authorised PS Member. Results are printed by the internal printer of the Ballot Generator. To facilitate transmission of the results, a QR code is printed on the results slip with the coding of the results on all votes casts per party/candidate. The QR is read by the Electronic Pollbook and results data sent to the central servers.

7.2 The Polling Station workflow – Electronic Pollbook plus Scanning Machine

The Electronic Pollbook and the Scanning Machine are integrated in the polling station workflow as follows:

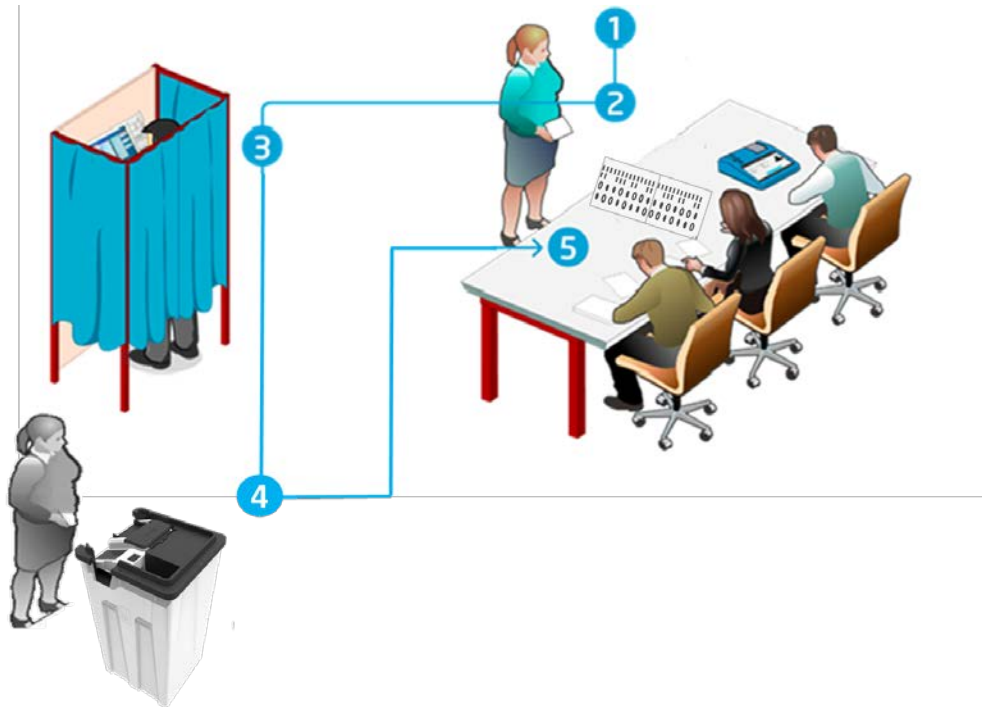


Figure 7 - Polling station workflow: EPB + Scanning Machine

| 1 | 2 | 3 | 4 | 5 |
|---|---|--|---|---|
| Voter hand in their ID card to the PS member. | Barcode on ID is scanned by the EPB and PS member checks voter's details and eligibility status on the screen of the EPB. PS member give the ballot paper to voter | Voter completes the ballot paper in the voting booth | Voter casts the voted ballot in the scanning machine. Some Scanning Machines can be set to query voters about over votes, under votes, blank ballots or other situations | Voter is returned their ID and leaves the polling station |



7.3 Volumes of equipment

Volumes of equipment at polling stations are estimated taking into account several factors. Some of them are quantitative factors and others are qualitative. Some of those factors are:

- Number of registered voters
- Estimated turnout
- Number of concurrent elections
- Ballots complexity
- Average time to complete the ballot paper/s
- Voters attitude towards technology
- Public tolerance towards queuing
- Whether the polling station is located in a remote/rural location or, in or close to a more accessible geographical area
- Costs

To strike the right balance is not easy. However, the proposed phased deployment across a minimum of two election events would provide the opportunity to understand some of those factors and come up with a data-based criteria to calculate equipment volumes requirements.

We have attempted to do the exercise of trying to estimate volumes based on the quantitative factors:

- Voters cast an average of 4 ballots for General Elections and 1 ballot for Local Elections. Some of the ballots are easy to complete but others are quite complex. Turnout is usually less than 60%.
- Out of the 5,500 polling stations across the country, approximately 3,000 have less than 600 registered voters, and approximately 1,000 of those have less than 300 registered voters.
- To complete the voting options in a General Elections a voter would need an average of 10 min on paper and 5 min on a screen (assisted by the navigation system of the application)

Based on the above, we would suggest the following volumes

| No. Voters | <300 | > 300 <600 | > 600 <1000 | >1000 | TOTAL |
|--|------|---------------|----------------|-------|-------|
| No. Polling stations (approx.,) | 1000 | 2000 | 2700 | 4 | 5.704 |

Table 7 – Number of polling stations per average number of voters

| Units per polling station | <300 | > 300 <600 | > 600 <1000 | >1000 | No. Units |
|---------------------------|------|---------------|----------------|-------|-----------|
| EPB | 1 | 2 | 2 | 3 | 10.412 |
| Scanning Machines | 1 | 2 | 4 | 5 | 13.112 |
| Ballot Generator | 1 | 3 | 5 | 6 | 20.524 |

Table 8 - Estimated required volumes of equipment at polling stations

To account for contingency in small polling stations, we suggest keeping intermediate logistics locations with a small number of backup machines. These locations should be strategically distributed across the country to service small polling stations within a 30 minute drive distance.



7.4 Other considerations

- **Legislation changes**

Any implementation of technology at polling stations will require a review and update of legislation and regulations. The legal framework should be in place at the beginning of Tranche 1.

- **Lease or buy**

As we have mentioned earlier, we would recommend a phased deployment of the technology at polling stations. The number of polling stations equipped with technology in the first election event should be set to have a risks-controlled operational environment (suggested: a maximum of 20% of polling stations). The number can scale up for successive elections to reach the 100% of polling stations on the third election event.

CEC should consider various commercial scenarios: lease with a purchase option, purchase, or lease for each election event. The decision should take into account the product lifecycle, maintenance and storage costs and the availability of maintenance and support services beyond the standard product lifecycle...

- **Logistics**

The logistics associated to the deployment of technology at polling stations should not be underestimated. It should include temporary storage, custody of material during the process, deployment and reverse logistics, and the organisation of the technical support (on-site and support line)



8 Organisational approach to deliver the Action Plan

The CEC and MECs have limited resources and lack enough staff members and specialised profiles to successfully deliver the entire five-year Action Plan in-house, while concurrently running their day-to-day operations. Therefore, some of the projects in the Action Plan will need the support of external suppliers to provide the technology and skills necessary to develop and deploy them.

Working with external suppliers could be an excellent opportunity for CEC/MEC staff to grow their skills in key areas (processes definition, information systems and elections technology). We suggest building embedded high performing CEC/MECs-supplier project teams for those projects that will require external support. This way, their own staff would build critical operational and technical capabilities appropriate to their role and level, thus ensuring the sustainability of the Strategy beyond the five-year implementation.

Still, CEC will have to reinforce their own internal organisation with more specialised staff. The main profile that CEC will need are project managers that will directly project manage some of seven projects, and will jointly manage others with external contractors.

Since the Strategy has a strong ICT component, another key profile CEC organisation will need to reinforce is technologists.

8.1 Project management arrangements

In order to deliver the projects in our Action Plan alongside the day-to-day activities of the CEC/MEC, we recommend arranging the work into three categories: **election delivery projects, enhancement projects and strategic projects**.

- **Election delivery projects** At the core of elections administration work are activities related to the delivery of the electoral cycle. From the time an election process is called for (in May of each election year) until approximately the end of the year, the CEC and MECs are responsible for planning, executing and monitoring all the tasks involved in elections delivery. This work will be carried out within the scope of the Elections Delivery Projects.
- **Enhancement projects.** These projects draw from lessons learned and performance reports collected at the end of each Tranche from the CEC/MECs delivery staff, stakeholders and from international best practices comparators. These projects should have agreed on outcomes and plans in place to deliver them.
- **Strategic projects.** These are the seven projects that will deliver the implementation of the Strategy and Action Plan for a five-year period. CEC will need to work closely with MECs and other stakeholders to develop the scope and ambition of these projects.

Some of the projects in the Action Plan have a development phase and a deployment phase which takes place at one of the two election events in the five-year Strategy implementation cycle. Projects with an election-related deployment component are:

- Project 2 – Implementation of information systems to ensure integrity of election results data
- Project 3 - Implementation of voting/counting technology at polling stations
- Project 4 – Improving the quality of elections databases and facilitate out-of-country voting

The **development phase** of these three projects should be run under the category of **strategic projects** while the **deployment component** should be run under the category of **election delivery projects**.

This is an important distinction because, due to the phased deployment across the two election events, the new systems will have to be integrated with existing ones and the CEC and MECs will have to incorporate this into their election planning.



As the Action Plan implementation progresses along the five-year life cycle, the enhancement projects will take care of the updates or refinements on the ICT solutions delivered by the Action Plan. These updates will draw on the lessons learned and performance reports produced at the beginning of each Tranche.

The Project Management Office (PMO)

A PMO is the backbone of a successful project management approach at any organisation. This is why we strongly recommend CEC to set up a PMO to facilitate project success by establishing best practices, mitigating risks and ensuring on-time project delivery within a specified budget.

The PMO will also monitor and control the execution of the seven projects and their coordination within each Tranche. Additionally the PMO will support the Action Plan implementation by:

- Managing resources for projects.
- Delivering training and mentoring project team members.
- Monitoring and evaluating projects performance to established goals.
- Preparing risk analysis and action plan to mitigate the risks
- Gathering data about projects progress and producing reports.
- Managing dependencies across projects

Additionally, we proposed that the PMO will take part in Project 1 ("Introducing organisational efficiency) in the development of the methodology and processes for project management in the CEC.

We estimate that the PMO will required one full time resource (if possible an experienced project manager).

Project Managers and Technical Leaders

Besides the PMO, the CEC should have a pool of project managers and technical leaders to run the seven projects in the Action Plan.

As mentioned previously, some of the projects will be delivered by CEC in-house. This projects will require a project manager and most probably a technical leader too.

Other projects will require contracting external suppliers to deliver them. For these projects, CEC should appoint a full time CEC project manager and a technical leader that will work embedded into the project team of the supplier. This is the way to guarantee knowledge transfer and the development critical operational and technical capabilities on CEC staff.

To deliver the Action Plan, we estimate there should be a pool of five project managers and four technical leaders within the CEC organisation.

Project Management Tools

The development of these tools are part of the scope of Project 1. They will constitute a useful resource for the PMO and the project managers when managing and monitoring the projects. The tools will support the methodology and processes defined also as part of Project 1. As mentioned before, we suggest the PMO takes part in the definition of the project management methodology and tools.

The PM tools should include: tools for project planning based on a work package structure, tools for budget estimation and costs reporting, tools for quality and risks monitoring and control. They would also include reporting module and key project indicators on three categories:



Figure 8 - Categories of key project indicators



9 Estimated budget

We are providing our best estimate of the budget necessary to deliver the Action Plan. The estimates are based on market research and experience. This budget should be considered a broad approximation that needs to be further fine-tuned but that could be used as a starting point when addressing the funding aspects of the delivery of the Strategy.

9.1 Main ICT Systems

There are products available on the market that deliver basic elections management functions (voter registration, election management systems...). However, those commercially available products will need to be adapted to the complex BiH elections administration legislative and operational environments. And most probably, those products will not cover all the functionalities that will be required by CEC.

For the cost estimate exercise, we assume that ICT systems will be tailored-made solutions, specifically developed for CEC. These ICT systems are:

- Nominations system
- Polling Stations Central Monitoring System
- Collation, consolidation and generation of results System
- Central Voters Register
- On-line ballot delivery
- Polling Station Management System (GIS)
- MECs/CEC count centres support

9.2 The costs components on machines at polling stations

A typical breakdown² of acquisition costs components of a Ballot Generator/Scanning Machine over a 10 year lifecycle would include:

- Year 1: fees associated with acquisition of hardware and software, implementation services, and first-use Election Day support.
- Years 1 through 10: costs associated with consumables such as ballot printing, thermal paper rolls, batteries replacement...
- Years 2 through 10: fees associated with storage, ongoing maintenance and license fees (Machine SW and Election Management Software license fees). License fees increase annually as is the common industry practice.
- Years 2 through 10: costs associated with onsite support fees per election event

Current best estimates of market prices (without possible discounts):

- Scanning Machines average market price: 5.500 USD³.
- Ballot Generator Machines average market price: 3.000 USD
- Electronic Pollbooks average market price: between 1.000 to 1.200 USD
- Software license fees (annual):
 - Election Management Software (Central): 50.000 USD
 - Elections Management Software (each Municipality) : 30.000 USD
 - Scanning Machine SW: 80 USD per unit
 - Ballot Generator SW: 65 USD per unit
- Scanning Machine maintenance per unit per year: 110 USD

² *Georgia State Election Technology Acquisition- A Reality Check*. The OSET Institute Briefing. Prepared By: Edward Perez. Global Director of Technology Development. March 2019

³ Prices in USD to keep original reference



- Ballot Generator maintenance per unit per year: 75 USD
- Ballot Printing: 0,40 USD per ballot

We have used the above reference prices for the budget estimates.

9.3 Infrastructure costs

As described in the Strategy Outline document, we recommend that some of the information systems use a cloud-based architecture and some of them an in-house infrastructure.

The in-house infrastructure can be outsourced to a datacentre service provider in either a hosting or housing scheme. Outsourcing the datacentre offers significant advantages in terms of costs, flexibility to accommodate extra capacity, extra services and technology updates, while guaranteeing performance, reliability, data confidentiality, data integrity and security standards. Additionally, their installations are usually energy-efficient.

Datacentres providers offer hardware leasing, data backup, data monitoring, and data storage, physical space for infrastructure own by the client, and a series of services that would fulfil CEC infrastructure and service requirements at a fraction of the cost.

Whether the datacentre is installed at CEC or outsourced, the architecture should be designed to service the core ICT systems in the Strategy and Action Plan, such as the Central Voters Register, the Electronic Pollbooks and Ballot Generator/Scanning Machines solution, the Collation and Reporting of Results solution etc...

The pricing included in the budget would cover the cost of ownership of the hardware and first year software licenses of an ICT infrastructure⁴ that supports the above ICT systems and complies with the following principles while providing :

High Availability

To guarantee the availability of the information and of the applications, the ICT architecture must be designed to avoid single points of failure. This can be done through the implementation and use of different availability techniques to provide 1+1 or N+1 redundancy depending on the specific component.

Beyond the use of redundant configurations, the architecture must comply with the principles of physical isolation (logical and functional) and high availability configurations.

Security

The security of the architecture is based on two principles: least minimum privilege and defence in depth. The first limits the access of users/services to data and functions to the least minimum necessary. The other provides additional controls to a simple firewall, such as including IDS, SIEM and anti-virus that can detect, limit and prevent activities that may be suspicious.

Virtualisation

Virtualization provides the following benefits:

- Faster system deployment and backup
- Faster environment replication
- Better physical hardware utilization
- Improved use of the operating system instances (RAM, CPU, etc.)
- Dynamic scalability and load balance among physical servers
- Additional high availability measures

In the budget estimate, we have estimated the cost of ownership of the infrastructure sized to support those ICT systems.

⁴ Excluding communications



9.4 Information systems licenses

Our approach is that the following systems should use commercially available applications:

- Document Management System (DMS)
- Project management tools
- Logistics Support System
- Temporary Human Resources Management System
- e-Learning Platform

The costs included in the budget estimates are related to the work to define what is required, evaluate the best commercial options, configure the commercial applications for the CEC and develop the functionality that is not covered by the commercial platform.

The costs of the commercial licenses are not included in the budget estimates.

9.5 Budget

9.5.1 Development costs

| PROFESIONAL SERVICES | Tranche 1 21 months (Euros) | Tranche 2 12months (Euros) | Tranche 11 months (Euros) | Tranche 4 14 months (Euros) | TOTAL per project (Euros) |
|--------------------------|-----------------------------------|----------------------------------|---------------------------------|-----------------------------------|---------------------------------|
| Project 1 | 1.072.000 | 599.000 | 581.000 | 522.000 | 2.774.000 |
| Project 2 | 3.749.000 | | 1.611.000 | | 5.360.000 |
| Project 3 | 1.155.000 | | 253.000 | | 1.408.000 |
| Project 4 | 1.026.000 | 1.386.000 | 315.000 | | 2.727.000 |
| Project 5 | 167.000 | 33.000 | 104.000 | 98.000 | 403.000 |
| Project 6 | 269.000 | 224.000 | 134.000 | 350.000 | 977.000 |
| Project 7 | | | 145.000 | 101.000 | 246.000 |
| TOTAL per Tranche | 7.437.000 | 2.242.000 | 3.143.000 | 1.072.000 | 13.895.000 |

Table 9 - Budget - Development Costs



9.5.2 Hardware at polling stations costs

| Units per polling station | <300 | > 300 <600 | > 600 <1000 | >1000 | Total No. Units | Unit Cost (USD) ⁵ | TOTAL Cost Full roll out (USD) |
|---------------------------|------|------------|-------------|-------|-----------------|------------------------------|--------------------------------|
| EPB | 1 | 2 | 2 | 3 | 10.412 | 1.200 | 12.494.400 |
| Scanning Machines | 1 | 2 | 4 | 5 | 13.112 | 5.500 | 72.116.000 |
| Ballot Generator | 1 | 3 | 5 | 6 | 20.524 | 3.000 | 61.572.000 |

Table 10 - Budget - Hardware at polling Stations Costs

9.6 Infrastructure costs

Cost of ownership datacentre equipment: **100.000 Euros**

⁵ Prices in USD to keep original reference



10 Top level planning

Please refer to the attached dike “Annex 1- Action Plan Full Project Planning Draft 1.mpp”

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