ANNEX 1 – TECHNICAL REQUIREMENTS

EPOS Research Infrastructure
Website Design, Development and Maintenance

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1. New website provider selection

EPOS, the European Plate Observing System, is the research infrastructure aimed at ensuring sustainable and universal use and re-use of multidisciplinary solid Earth science data and products fostering state-of-the-art research and innovation.

EPOS brings together Earth scientists, national research infrastructures, ICT experts and decision makers to establish and underpin a sustainable and long-term access to solid Earth science data and services integrating diverse European Research Infrastructures under a common federated framework. EPOS relies on e-science innovation to foster progress in science for supporting a safe and sustainable society.

The current selection process is aimed at obtaining the ideation and implementation of the new EPOS RI website, according to the general Communication Guidelines provided in **Annex B - Communication and Graphic Specifications.**

The EPOS website is considered the important communication tool of the EPOS Research Infrastructure to get its message across to different stakeholders: government organizations, researchers, and users across Europe. In the website the following 3 EPOS main directions of activities should be equally well represented:

- the *Integrated Core Services* platform (ICS): The EPOS website will provide a complete and easy-to-use general description of the EPOS Integrated Core Services Portal.

- *Delivery framework* (TCS and ICS): The EPOS website should clearly document the collaborative activities between the scientific Thematic Core Services and the ICS.

- *EPOS ERIC*: EPOS ERIC pages will be targeted at Governments' representatives; thus, they should be more formal.

The design should appropriately strike a balance between captivating visuals and the peculiar scientific, pan-European breath of the project's target audiences.

A set of logos and a colour palette had been with the project branding for a long time and thus must be preserved in the restyling (see Annex 2 - communication and graphic specifications).

The website will be hosted and maintained on Apache Unix Servers at the Bologna INGV CED.

2. Required services
- Benchmark analysis
- Graphic design
- UX/UI definition for an appropriate customer journey
- Content migration from the current EPOS website and content rewriting
- Development and Configuration of the new website
- Social media coordinated branding (newsletter template, Facebook cover, Twitter header etc)
- Maintenance, handover and training for the INGV content manager of the developed and configured site.

2.1. Benchmark Analysis
The provider should perform a Benchmark Analysis of the main digital scientific research platforms available on the Internet, in compliance with the benchmark analysis made by EPOS ERIC.

To define which are the best practices in terms of:

- content presentations
- graphic proposition
- Tone of voice
- Strengths and Weaknesses for each website.

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2.2. UX/UI Definition

The website is expected to be used by very different users, and it must first and foremost present the infrastructure in a clear and easy to understand way:

- Researchers, scientists approaching EPOS for the first time
- Users who already know the infrastructure
- Members of governments
- Members of the European Commission.

Different audiences may access the website for several reasons.
The provider should define a new User Experience (UX) and User Interface (UI) for the website development.

1.1.1. UX

UX should be based on the following characteristics:

- EPOS vision: to support collaborative research approaches in Earth science data and services by making them universally accessible and usable.
- EPOS mission: to create and operate a sustainable, distributed and long-term access to solid Earth science data and services that integrates diverse European Research Infrastructures under a common, federated framework.
- EPOS tone of voice: Professional and service-oriented, Authoritative, Innovative and informative, International and connected, Proud.
- EPOS Strengths
  - Clear vision and good planning (legal, financial, governance, scientific, ICT plans and models)
  - Integrating national research structures (involve more than 256 Institutes, 25 European Countries, International organisations, projects)
  - Innovative approach to data science (FAIR data)
  - Sharing multidisciplinary data and research results
  - Harmonised data management across TCS (Thematic Core Services) (Thus e-science solutions for enabling access, storage, preservation and curation of large amounts of data are made available within EPOS).
  - Community building and knowledge transfer
  - Federated system. The TCS-ICS federated system is the skeleton of the EPOS Delivery Framework and represents the solution for integrating distributed infrastructures via shared standards for data and metadata, which will allow researchers unprecedented opportunities to use and analyse multidisciplinary solid Earth science data, detect new signals in complex datasets and lay the ground for widespread application of advanced data analysis methods in the Earth sciences.
  - ESFRI landmark (EPOS was selected for the excellence of its scientific output and its maturity in the implementation phase with the aim of playing a role in the reinforcement of critical areas of competitiveness for European research.)
  - ERIC established. On October 30th, 2018, EPOS was granted the legal status of European Research Infrastructure Consortium (ERIC) by the European Commission.)
  - From the 1st of February 2020 (until 2023) the EPOS SP project, funded by the European Union's Horizon 2020 and managed by EPOS ERIC will perform activities aimed at ensuring the long-term sustainability of the EPOS Research Infrastructure.
- Stakeholders (EPOS target groups and for the website, including their needs). The communication activities will be targeted at the following specific audiences:
  - Researchers, i.e. data providers, data users within the solid Earth science community and outside it, IT experts
  - Master and PhD students in the field of Earth science will have a unique opportunity to access a huge and reliable amount of data and services freely available

- Policy makers and governments (including Environmental and Civil Protection Agencies)
- Private sector can be both suppliers and data users and they will be targeted when EPOS' service proposition will be ready to use.
- Media will be approached during the Operational Phase.
- Society: EPOS has a big value for society as it helps facing the ongoing global challenges, when the service proposition will be completely functional and the community will be more active.

The basic elements of usability are:

- System state visibility. The web page must explain itself: it must be clear, without obliging the user to think about what the site is about and to whom it is addressed. Users do not have to ask themselves questions like: where am I? Where do I start? Where did they put...? Why did they call this element in this way?
- Alignment between system and reality: The site must speak the language of the users, with words and phrases familiar to them, depending on the target audience.
- Give control and freedom of exit to the user. If the user makes a "mistake" there must be "emergency exits" to return to the beginning or to the previous point without very long paths.
- Consistency and standards. Users proceed very quickly so it is essential to take advantage of conventions (for example, it is common to find the logo at the top left corner, the navigation button at the top horizontal side or left if vertical, as well as specific icons for research or videos).   Users are used to instinctively recognize certain elements and the functionality of the site. It is therefore a good rule to adhere to conventions and standards.
- Error prevention. It is common sense to use unambiguous links, legible urls, easy orientation and breadcrumbs. Breadcrumbs are useful for letting the user understand the path taken, where he/she is and how he/she can go back quickly.
- Recognition rather than memorization. The less effort the user needs to do, the better. The user's mnemonic effort should be minimized and objects, actions, options should be made visible anywhere on the site.
- Flexibility and efficiency of use. The system should be made functional for experts, but also for non-experts.

1.1.1. UI

- There should be no irrelevant or rarely used information. Each information element competes with others and decreases their relative visibility. EPOS should create effective graphic displays, making sure that what matters most will be properly highlighted. There must be a clear visual hierarchy. Other design tips include: dividing pages into clearly defined areas; clear titles of the links; elimination of distractions like disorganized pages or overcrowded information; formatting the page so that it is easier to read (readable font, not too small, with many paragraph titles, write short paragraphs, use bulleted lists, highlight key terms). All pages must have a clear and unique name, must be in the right place within the page, must be clearly visible and of course it must correspond to the linked title the user clicked.

3. Navigation hierarchy

Once selected the Provider should develop a 4-levels website hierarchical structure, to be further discussed and refined with the EPOS Communication Office, starting from the below structure as a reference:

- Homepage
- About
  - What is EPOS
  - Why EPOS
  - Who makes EPOS
    - The Community
    - Project Partners
    - Project Associate Partners & Contributing Institutions
    - Stakeholders
  - How EPOS Works
    - Functional Architecture
    - Legal framework
    - Financial Framework
  - EPOS Timeline
  - EPOS Preparatory Phase
  - EPOS Implementation Phase
    - EPOS Implementation Phase project
    - EPOS Legal Entity
  - EPOS Pilot Operational Phase - POP
    - EPOS Sustainability Phase project (To BE implemented)
  - Glossary
- Who benefits
  - Scientists & Researchers
  - Governments and Society
  - Private Sector
- Data & Services
  - EPOS Thematic Core Services - TCS
    - Seismology (Level 4: mini-sites: Home - Overview | Contact - Objectives Internal organization - Services - News and Events - Outreach Materials)
    - Near-Fault Observatories (Lev. 4 - mini-sites)
    - GNSS Data and Products (Lev. 4 - mini-sites)
    - Volcano Observations (Lev. 4 - mini-sites)
    - Satellite Data (Lev 4. - mini-sites)
    - Geomagnetic Observations (Lev. 4 - mini-sites)
    - Anthropogenic Hazards (Lev .4 - mini-sites)
    - Geological Information and Modelling (Lev 4 - mini-sites)
    - Multi-Scale Laboratories (Lev 4 - mini-sites)
    - Geo-Energy Test Beds for Low Carbon Energy (Lev. 4 - mini-sites)
  - Data & Products
  - ICT Architecture
    - ICS Architecture
    - TCS IT-Architecture
    - ICS-TCS Communication
  - Demonstrator
  - Technical Documents

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- NEWS | EVENTS & DOCS
  - News
  - Events
    - Past events
    - Upcoming events
  - Newsletter
    - Newsletter Articles
  - Outreach materials
    - LOGO & CORPORATE
    - FLYER & POSTER
    - BROCHURE & PRESS
    - PRESENTATION
    - PHOTO GALLERY
    - VIDEO
  - Useful links
  - Documents
    - IT documents
    - Legal documents
- EPOS ERIC (To BE implemented)
  - Governance
  - Documents
  - Career
  - Calls for tenders

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The 10 TCSs are organized as mini-sites, one for each TCS. In the figure below an example of the TCS mini-site homepage.

4. Content migration and rewriting

The provider, according with the new UX/UI defined within the project, should migrate contents from the current EPOS website

https://www.epos-eu.org/

Performing the contents migration, the provider should adapt the content to the new UX/UI and propose all the necessary graphic changes and contents rewritings.

This activity will be performed with a strict supervision of the EPOS Communication Office.

The website will not provide web services such as direct access to data and visualization tools, since all such services are being developed on EPOS's Integrated Core Services portal.

Furthermore, the EPOS intranet is providing the community all services for meetings enrolment, status updates, document repository, video-conferencing.

Thus, there will be no real need for forms and related data-management scripts, nor of extra database tables aside from those used by the chosen CMS.

The Provider is expected to develop samples for:

- the Homepage,
- detailed navigation menus,
- Breadcrumb and Footer
- long-article pages with related-documents and news boxes
- intermediate pages with listings of linked additional documents

and a few easy to use tools ensuring content-editors can insert rich UI elements into the standard global templates:

- Easy syntax for generating listings of documents by folder or tags, specifying sorting options, title fields, abstract length, thumbnail.

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- Easy syntax for <u>publishing spreadsheet-like tables</u> with variable number of columns, sorting on any column, filtering by search terms.
- A <u>Styling Reference Document</u>, i.e. a sample HTML page exemplifying all visual constructs available in the branded UI and displaying the corresponding CSS classes.
- A <u>customization of the CMS online textual editor</u> to provide such styling options, i.e. the CSS class names found on the Styling Reference Document should be provided in a menu of the editor, ready to be applied to selected blocks of text.

5. Website development

The provider should develop / configure the new EPOS website. The new Website should be based on a Content Management system with the features described below.

5.1. CMS

The Epos website should be created through a commonly used CMS (Content Management system). This software should have these features:

1. Open source license
2. Back Office to easily manage page contents and translations
3. Profile definition for back office function to let back office users manage their specific contents
4. Templating system to duplicate pages
5. Visual editor to create contents and pages without coding (like WordPress Elementor, Visual composer, Gutemberg etc)
6. Plugin system to manage implementation and integration with external platform and application (like Mailchimp, social integration, Google Analytics)
7. Media gallery management (video, audio, image, pdf document)
8. Back Office roles and back Office function profile management

The feature number 8 is explicitly required to let the EPOS Communication Office to configure and profile specific back office users to manage only some website pages. In particular the TCS mini-site could be managed directly for the TCS communication manager.

1.1.2. Software standard and usability

The new EPOS website should be compliant with the Design System Guidelines for the Public Administration digital services. In particular the website should be compliant with the:

- User research guidelines
- Service design guidelines
- User interface guidelines
- Content design guidelines

All references are updated and maintained on the Designer Italia website in the guidelines section available at the following link: https://designers.italia.it/guide/

- The provider should develop the new Epos Website ensuring full compliance with all current web-Standards (HTML5, CSS3, ECMAscript 6 Javascript) and best-practices for mobile-first; responsiveness, rendering performance, caching, WAI-ARIA accessibility.
- The Implementation should be based on a CSS framework such as Bootstrap, Material Design, Foundation.
- The Back office should comply to the above requirements to the maximum extent possible.
- Validation scores of the public pages and back office UI will be evaluated.

1.1.3. SEO & SEM

The provider should develop the new Epos website using the latest Search Engine Optimization and Search Engine Management methodologies and standards.

The provider should propose for each page of the website:

- Meta description
- Title
- Keywords
  - Open Graph Metadata:
  - Image
  - Description
  - Url
  - Title

Through industry research, users show they prefer sites with a great page experience. In recent years, Search Engine Algorithms has added a variety of user experience criteria, such as how quickly pages load and mobile-friendliness, as factors for ranking results.

The new EPOS website will be evaluated using Lighthouse performance scoring (https://web.dev/performance-scoring/). The performance should be greater than 50 on a scale between 0 and 100 on each page.

Performance (speed page) using the Google PageSpeed Insights for both Mobile and Desktop tests.

In order to let the EPOS Communication Office analyse the page traffic and website usage, the provider should install the Google Tag Manager.

1.1.4. Security and CMS upgrade

The provider should adopt the necessary security strategies for the software configuration and development like:

- Upgrade the CMS to the latest stable version
- Install security patches
- Install security plugins if needed
- Verify the installed plugin safety level
- Apply all front-end security best-practices to the HTML code of the pages, and for data sanitation in case of HTML forms.

1.1.5. Website development

Using a CMS the provider should configure all site pages agreed with the EPOS Communication Office.

The website development will be divided in several phases. For each phase one or more deliverables are expected. Providers should propose the adequate deliverables for each phase. The expected development phases are:

- New website proposal
  - UX/UI and new graphic
  - Website Hierarchy
  - Content rewritings
- Environment configuration (see Application Environment paragraph)
- Page configuration and implementation
- Software implementation if needed
- Unit test
- User Acceptance Test (UAT)
- Production deploys

The development process will be overseen by the EPOS Communication Office and EPOS IT project manager. Each deliverable is expected to be approved by the EPOS manager in charge for the specific activity.

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1.1.6. Application Environment

During the development the Provider can/should configure and install the website in its own environment where User Acceptance Tests can be performed by EPOS content editors; once the website will be migrated to the production environment this mirror should be kept active as a testing environment until the handover and training phase is completed (6 months).

The Applicant will have access to the production environment with dedicated admin users.

1.1.7. Website Hosting

The Istituto Nazionale Geofisica e Vulcanologia (INGV) in quality of the EPOS ERIC Representing Entity will host the website at INGV data-centre in Bologna, on a high performance, high availability Unix cluster of virtual machines running Apache web server; a system administrator will always be monitoring the whole environment.

Thus, no further hosting services or CDN configuration is required to the Applicants participating in this selection.

The CMS can be based on open-source LAMP (Linux, Apache, MySSQL, PHP / Python / PERL), or JAMstack architectures (JavaScript, API, Markup, e.g. Gatsby.js).

6. Social media coordinated branding

The provider should supply all the necessary brand coordinated contents to let the EPOS Communication Office manage the social media available. In particular the provider should supply:

- MailChimp html template for newsletter management
- Facebook cover
- YouTube channel customization layout
- Twitter cover
- Instagram
- Other tools which will be defined later on with the EPOS Communication Office.

7. GDPR compliance

The new website should be fully compliant to the GDPR regulations.

According to EPOS Communications Office end EPOS ERIC legal department, the provide should supply these pages

- Terms and condition
- Privacy management
- Cookie policy

8. Maintenance, handover and training

8.1. Maintenance

After the new Epos website is deployed in production, the provider should supply an adequate maintenance plan for the next 6 months. In particular the plan should contain:

- CMS upgrade plan
- Security management plan
- Evolutive maintenance plan
- Corrective maintenance plan (bug fixing plan)

8.2. Handover and training

In order to let EPOS Communication Office and EPOS IT website manager become fully skilled in the website management the provider should:

- define a training plan for the EPOS content manager and editors (3 or 4 users)
- define a training plan for the IT manager
- provide all the necessary documentation on the developed website:

- Usage examples of all snippets used by the CMS to generate slideshows, pop-ups and similar rich-UI elements, as well as for the tools described in the section 'Content Migration and rewriting'.

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9.   Software and contents property

All the SW developed by the Provider during the contract and the third parties supplied software will be transferred to the EPOS ERIC that will proceed to reuse the developed software if necessary.

The provider should deliver 30 days after the deployment in production, the complete backup of the configured system, all the updated sources of the software developed, the complete documentation of the same according to the standards international reference, a detailed use and maintenance manual, both a user level as system administrator.

In order to let the EPOS Communication Office to reuse images and graphic assets and to develop the EPOS ERIC brand identity, the provider should supply all the graphic contents created and used in the website at the best resolution available.