

EPOS – the European Plate Observing System

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on behalf of the

EPOS Preparatory Project team

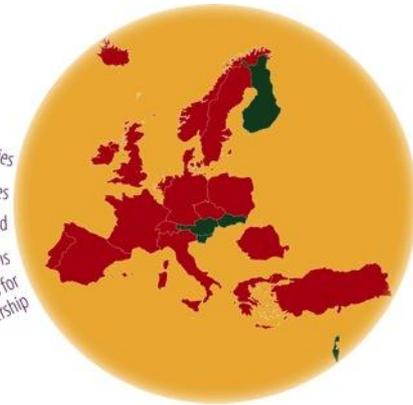
EPOS PP Mission

- The European Plate Observing System (EPOS) is a **long-term integrated research infrastructure plan** to promote innovative approaches for a better understanding of the physical processes controlling earthquakes, volcanic eruptions, unrest episodes and tsunamis as well as those driving tectonics and Earth surface dynamics
- The EPOS plan aims at integrating the currently scattered, but highly advanced European facilities into one distributed but coherent multidisciplinary Research Infrastructure (RI) taking full advantage of new e-science opportunities

EPOS PP Timeline

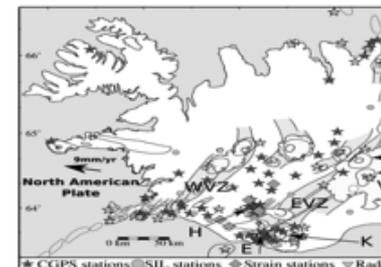


20 partners for 18 countries
6 associated partners for 5 countries
239 research infrastructures declared
170 institutes and organizations
On going initiatives for integrating the partnership



A multidisciplinary approach to environmental science

- The recent volcanic eruption in Iceland illustrates the need for **integrated multidisciplinary research infrastructures**
- The study and the monitoring of **volcanic ash emission** requires a **cross-disciplinary** and **multi-disciplinary** approach
- The **societal impact** of these events is very evident
- EPOS is fundamental to **understand** the processes, **forecast** the events, assess the **hazard** and **mitigate** the **risk**.



Earth scientists have a strong tradition of sharing data

- Research into structures and phenomena of global or regional scale demands access to comprehensive datasets
- Examples in seismology: Shide bulletins, ISS, ISC, and for Europe, EMSC and ORFEUS
- In geomagnetism, INTERMAGNET
- The International Geophysical Year, 1957-58
 - The ongoing World Data System
- Mature communities

... but,

- The European and international data centres handle only a fraction of all that is potentially available
- They are focused on specific disciplines (“thematic”)
- Much data exchange is conducted under bilateral agreements between organizations
- Data exchange arrangements are more mature in some disciplines than others
- Access to data is not consistent across all solid Earth science disciplines
- Facilities for data integration, analysis and modelling are limited and, where they exist, discipline-oriented

Why does European solid Earth Science need EPOS ?

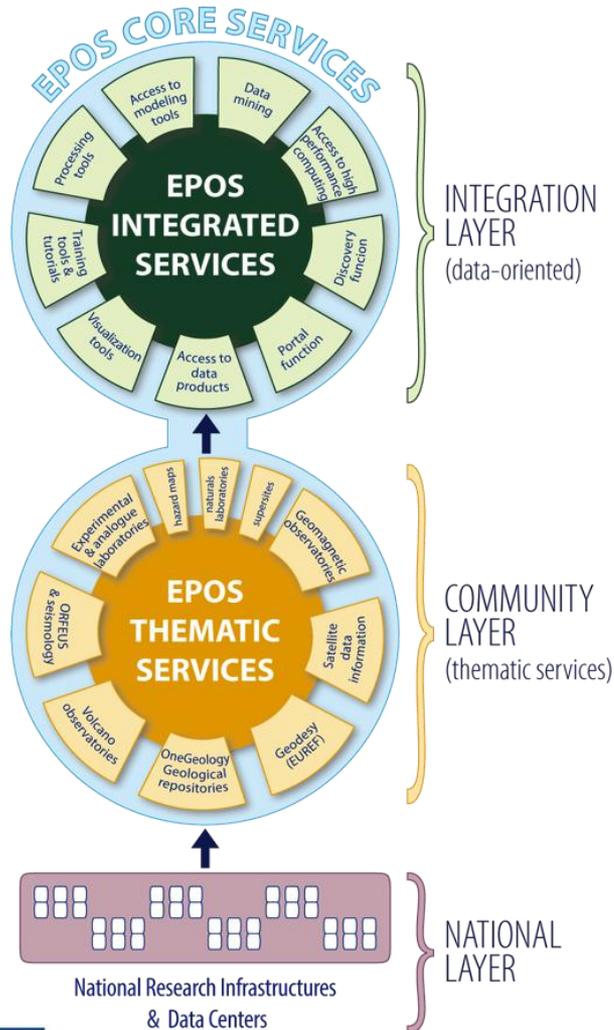
EPOS will integrate existing RIs and will develop thematic and integrated core services.

EPOS will provide the essential governance and legal framework to manage and implement the **Core Services**.

EPOS will coordinate initiatives for fund raising and will secure funds to maintain the operation of the **Core Services** in the long term.



What are the EPOS Core Services ?



The **EPOS Integrated Core Services** will provide access to multidisciplinary data, data products, synthetic data from simulations, processing and visualization tools, ...

The **EPOS Integrated Core Services** will serve researchers within and beyond the Earth Science community and other stakeholders, including young researchers (for example through training), professionals, and industry.

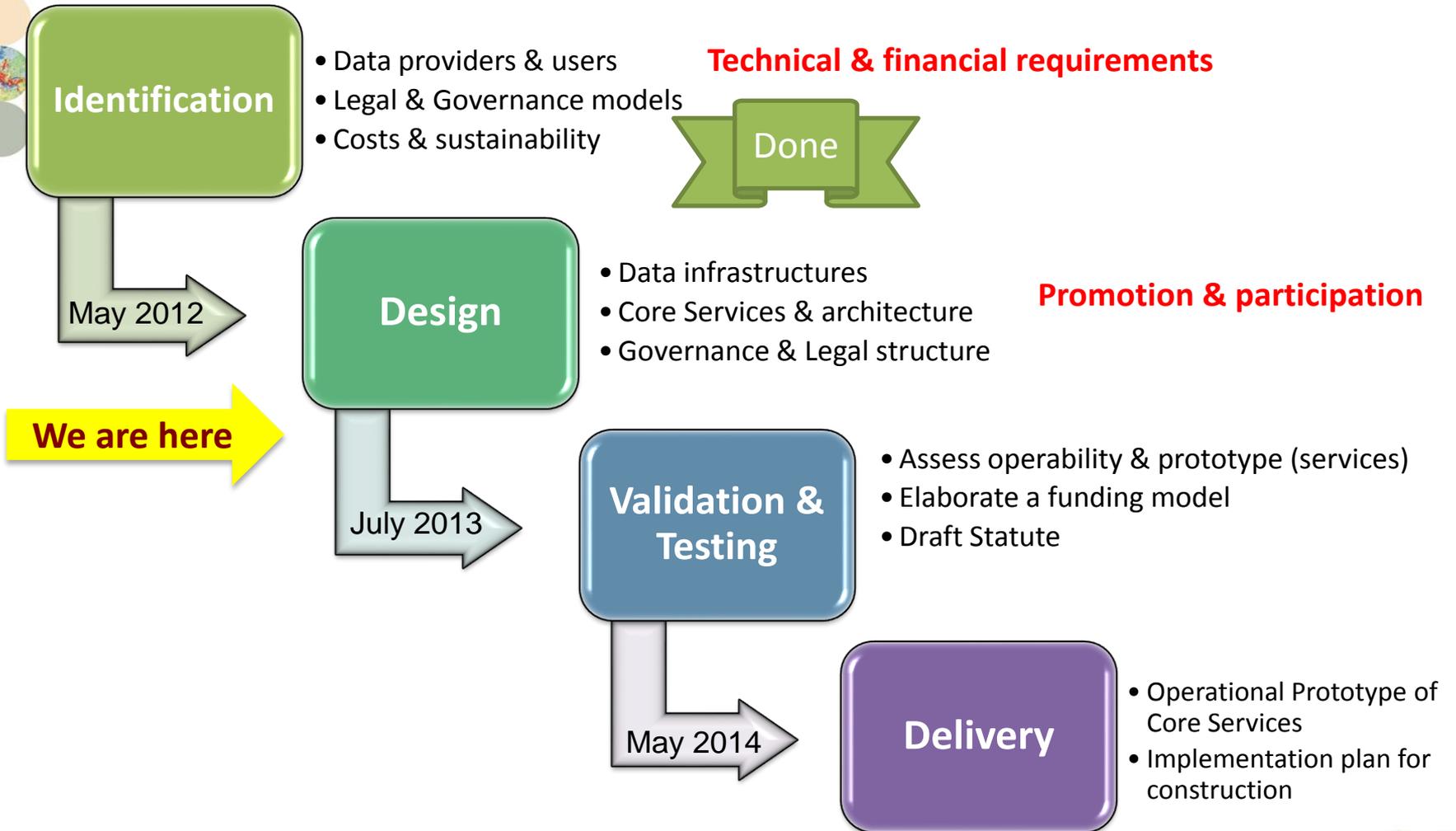
Thematic Core Services are Research Infrastructures that provide data services to specific Earth science communities. They may be delivered by other international or European organizations, such as ORFEUS for seismology.

National Research Infrastructures and facilities provide services at national level and send data to the European thematic data infrastructures.

Interlude - discussion

- Access to comprehensive datasets enables studies not previously practicable
- The sheer size of the datasets (petabytes++) demands substantial and specialized ICT systems and support
- Benefits in terms of integration of disciplinary communities
- Opportunities to share access to specialized facilities
- EPOS as a platform for the development of new projects – e.g. studies of continental structures, specific geohazards
- Extensible – as other geoscience disciplines reach a relevant stage of maturity, EPOS facilities can provide services
- EPOS will serve not only geoscientists, or even physical scientists, but researchers from social science and humanities

EPOS-PP Roadmap





<http://epos.bo.ingv.it/ride/>

What's RIDE? What's EPOS? Help Login

EPOS is: 129 Institutions

MAP OF:

- Seismic/GPS stations
- Laboratories
- etc....

EPOS
EUROPEAN PLATE OBSERVING SYSTEM

COUNTRY: click-to-select

Research Infrastructure List

- 226 Research Infrastructures
- 1658 GPS receivers (out of 2500)
- 2517 seismic stations
- 385 TB Seismic data
- 913 TB Storage capacity
- 909 storage data centers for seismology
- 512 instruments in laboratories

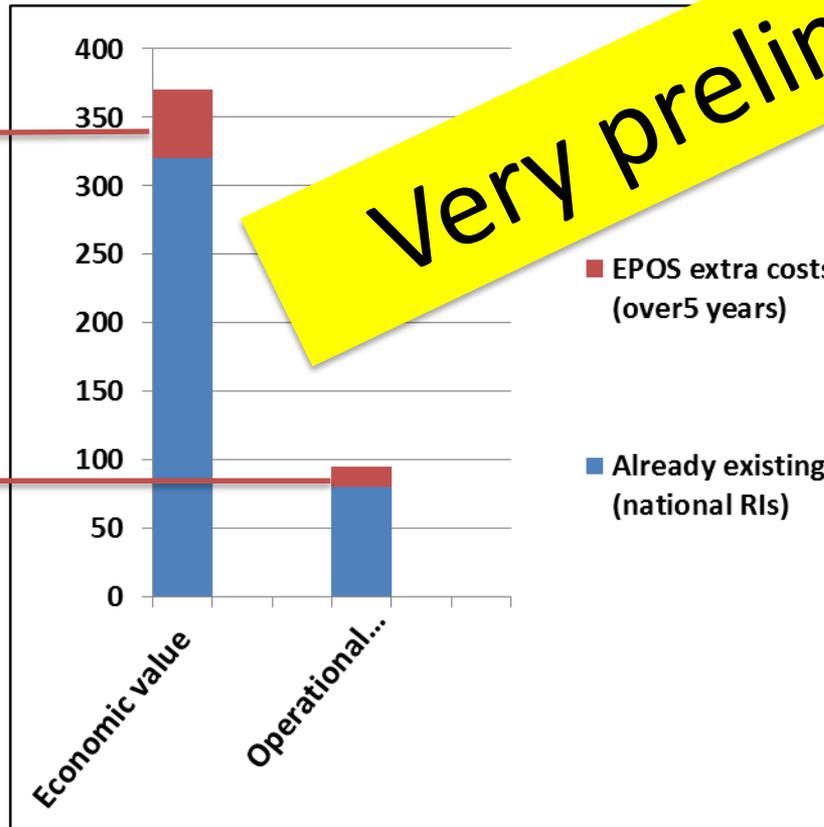
Legend --- : Laboratory - : Seismic Station

Cost assessment and national investments

Very preliminary

EPOS construction costs for Executive & Coordination Office, Integrated and Thematic Core Services

EPOS operation costs for Executive & Coordination Office, Integrated and Thematic Core Services



NB: the figures are expressed in Million Euros. For operational costs, the figures are presented in a yearly basis)

EPOS challenges



NERA



EXPLORIS
Explorative Earthquake Risk and Decision Support
For EU Populations Threatened by Volcanoes

Seismological Observatories & Research Infrastructures

Volcano Observations

Geological and Surface Dynamics data

Geodetic data

Other Geosciences data (OBS, Gravity data)

Analytical and Experimental Laboratories

ICT & e-RI Facilities

Satellite Information data

Geomagnetic Observatories

Infrastructures for Geo-Resources



www.epos-eu.org



SUPERSITES



SUPERSITES

Welcome to the Supersites

New Event [Van, Turkey, earthquake of 23 October 2011](#)



main

new event

news

documents

apply for access

contributors

publications

reports to space agencies

links

contacts & mailing list

Los Angeles

Seattle-Vancouver

Hawaii

Istanbul

Tokyo-Mt Fuji

Mt Etna

Mt Vesuvius

The Supersites have data for the study of natural hazards in geologically active regions, including information from Synthetic Aperture Radar (SAR), GPS crustal deformation measurements, and earthquakes. The data are provided in the spirit of GEO, ESA, NASA and the National Science Foundation (NSF), that easy access to Earth science data will promote their use and advance scientific research, ultimately leading to reduced loss of life from natural hazards.

Click on a site in the map below, or see the regions listed below in Geohazard Supersites and Geohazard Natural Laboratories.



Summary

Supersites is an initiative of the geohazard scientific community. The Supersites provide access to spaceborne and in-situ geophysical data of selected sites prone to earthquake, volcano or other hazards. The initiative began with the "Frascati declaration" at the conclusion of the 3rd International Geohazards workshop of the Group of Earth Observation (GEO) held in November 2007 in Frascati, Italy. The recommendation of the workshop was "to stimulate an international and intergovernmental effort to monitor and study selected reference sites by establishing open access to relevant datasets according to GEO principles to foster the collaboration between all various partners and end-users". This recommendation is formalized as GEO task DI-09-010.

For more information on the Supersites please contact Falk Amelung at the University of Miami (famelung@rsmas.miami.edu), Massimo Cocco (massimo.cocco@ingv.it), Francesco Gaetani at the GEO Secretariat (fgaetani@geosec.org), Craig Dobson (craig.dobson@nasa.gov), or Wolfgang Lengert at ESA (wolfgang.lengert@esa.int).

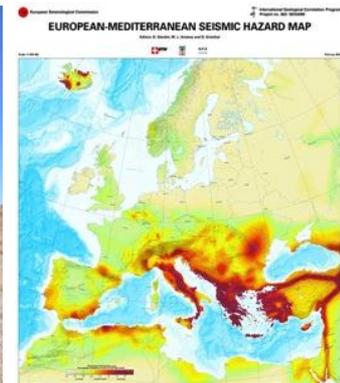


EPOS KEYWORDS

- **Integration** of existing national and trans-national RIs
- **Interoperability** and services to a broad community of users
- **Open access** to a multidisciplinary research infrastructure
- **Progress in Science** by providing prompt and continuous availability of high quality data and the means to process and interpret them
- Data infrastructures and novel core services, which will contribute to **information products, dissemination, education** and **training**.
- **Implementation** plans, which require strategic investment in research infrastructures at national and international levels.
- **Societal** contributions: hazard assessment and risk mitigation

I hope I have shown you that

- EPOS will
- .. integrate existing national and thematic infrastructures
- .. promote groundbreaking research that addresses priority issues for society
- .. increase the impact of Solid Earth Science research in Europe
- .. help to structure the European solid Earth science community, increasing its international competitiveness and enhancing progress in science
- .. create Core Services that will also support training, education and dissemination of relevant information





Thank you for your attention



www.epos-eu.org

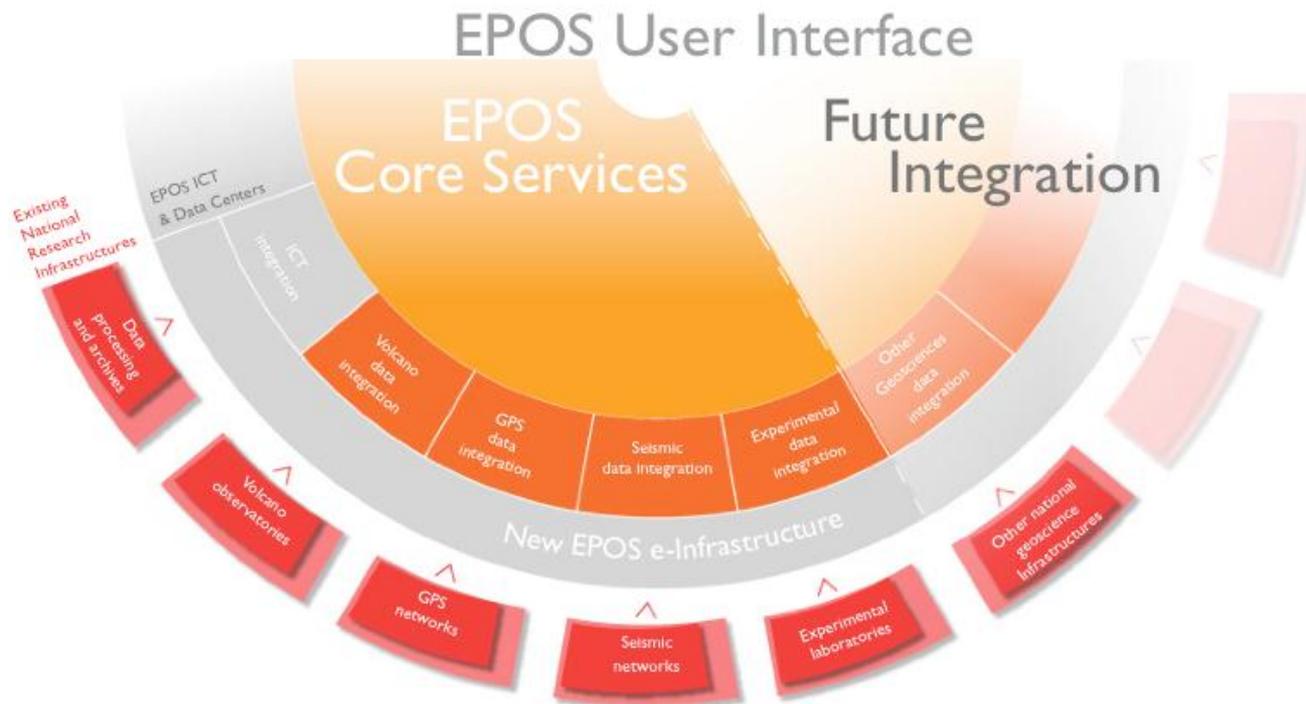
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Why is EPOS important for researchers?

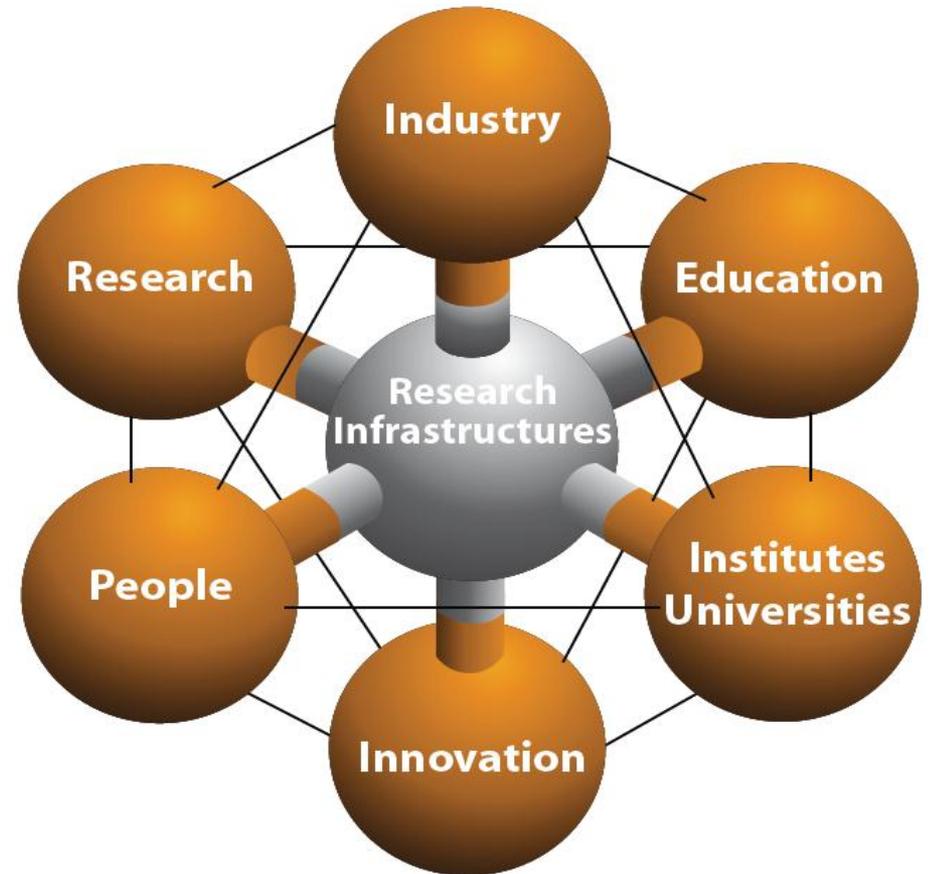
- It will provide **access to multidisciplinary** data, data products, processing tools, visualization software and data from simulations.
- It will allow each community to **open** their data infrastructures to **other stakeholders**, which is a precondition to join the **global data coordination**
- It provides coordination to cooperate with **e-science** community and participate to the **new ICT era**
- It will structure our community to improve our **future fund opportunities**
- It promotes **national implementation plans** that improve the research capacities and opportunities

An extensible system



The centrality of Research Infrastructures for Innovation

- Build excellent science opportunities for a better society
- Foster IT innovation for a better risk management of environmental hazards
- Open new business opportunities for the local and global economy
- Strengthen capacity building for new generations





EPOS infrastructure concept

