Research Infrastructures from FP7 to Horizon 2020

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Research Infrastructures

Research infrastructures are facilities, resources and services used by the research communities to conduct research and foster innovation.

Knowledge-based resources

Major scientific equipments

e-infrastructures
Why an EU approach for Research Infrastructures?

- To address collectively the complexity and cost of the design and development of new world class research infrastructures
- To open access to the research infrastructures existing in the individual Member State to all European researchers
- To avoid duplication of efforts and to coordinate and rationalise the use of these research infrastructures
- To trigger the exchange of best practice, develop interoperability of facilities and resources, develop the training of the next generation of researchers
- To help pooling resources so that the Union can also develop and operate research infrastructures globally
FP7 Research
Infrastructures action

(Budget: 1 715 M€ for the period 2007-2013)

Existing infrastructures

Integrating activities

e-Infrastructures

New infrastructures

Design studies

Construction (Preparatory phase; Implementation phase)

Policy development / Programme implementation
ESFRI roadmap 2010

48 new - or major upgrade of - Research Infrastructures of pan-European interest
(+ 3 additional projects from the CERN Council strategic roadmap for particle physics *)

<table>
<thead>
<tr>
<th>Social Sc. &amp; Hum. (5)</th>
<th>Life Sciences (13)</th>
<th>Environmental Sciences (9)</th>
<th>Energy (7)</th>
<th>Material and Analytical Facilities (6)</th>
<th>Physics and Astronomy (10)</th>
<th>e-Infrastructures (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHARE</td>
<td>BBMRI</td>
<td>ELIXIR</td>
<td>ICOS</td>
<td>EURO-ARGO</td>
<td>EUROFEL</td>
<td>ELI</td>
</tr>
<tr>
<td>ESS Survey</td>
<td>ECRIN</td>
<td>INFRA FRONTIER</td>
<td>LIFEWATCH</td>
<td>IAGOS</td>
<td>Windscanner</td>
<td>KM3NeT</td>
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<tr>
<td>ECRIN</td>
<td>INSTRUCT</td>
<td>EMSO</td>
<td>EPOS</td>
<td>EU-SOLARIS</td>
<td>European XFEL</td>
<td>CTA</td>
</tr>
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<td>CESSDA</td>
<td>EATRIS</td>
<td>SIAEOS</td>
<td>EISCAT_3D</td>
<td>JHR</td>
<td>ESRF Upgrade</td>
<td>E-ELT</td>
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<td>CLARIN</td>
<td>EU-OPENSCREEN</td>
<td>EMBRC</td>
<td>SIAEOS</td>
<td>COPAL</td>
<td>ESRF Upgrade</td>
<td>SKA</td>
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<td>DARIAH</td>
<td>Euro BioImaging</td>
<td>ERINHA BSL4 Lab</td>
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<td>ISBE</td>
<td>MIRRI</td>
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**RIs in the implementation phase**

**ERIC established**

**ERIC in preparation**

**RIs in the implementation phase**

<table>
<thead>
<tr>
<th>Distributed research infrastructures</th>
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<td>Single sited research infrastructures</td>
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The High Level Expert Group on Scientific Data presented **Riding the Wave** in October 2010

**Vision**: "data e-infrastructure that supports seamless access, use, re-use, and trust of data. In a sense, the physical and technical infrastructure becomes invisible and the data themselves become the infrastructure a valuable asset on which science, technology, the economy and society can advance".

implementing interoperable data infrastructure

(a) data generators; research projects, big research infrastructure, installations or medium size laboratories, simulation centres, surveys or individual researchers

(b) discipline-specific data service providers, providing data and workflows as a service

(c) providers of generic common data services (computing centres, libraries)

(d) researchers as users, using the data for science and engineering
Thematic distributed data infrastructures in FP7

RTD:
Topics targeting thematic distributed data infrastructures or thematic networks of RI providing data services were included in all the five FP7 RTD Calls for proposals.

More than 170 M€ of EC contribution

**Preparatory Phase Projects**: ELIXIR, ISBE, ICOS, LIFEWATCH, CLARIN, DARIAH, CESSDA, ...

**Implementation clusters**: DASISH, BIOMEDBRIDGES, ENVRI, CRISP

**Integrating Activities**: SEADATANET II, UP-GRADE-BS-SCENE, ACTRIS, NERA, IS-ENES, INGOS, JERICO, SLING, BBMRI-LPC, DwB, INGRID, ARIADNE, CENDARI, EHRI, ...

**ERANET and Policy support measures**: SIM4RDM, COOPEUS, CREATIVE-B, DARECLIMED

*Life Science Environment SSH Other*
data e-infrastructures in FP7

CNECT:
98 Meuro of EC contribution
5 Calls for proposals

First two calls (45 M): probing the European Research Data Space

Third call (4 M): FP7 OA Pilot/OpenAIRE

Fourth call (47 M): structuring the European Research Data Space along the Riding the Wave strategy

Fifth call (2M): iCORDI

Other projects, closely related with data infrastructures were funded in other parts of the programme (~80 Meuro)

distributed computing,

grids,

virtual research environments,

earth-server, ...
data infrastructure: bridging islands

network infrastructure, GÉANT

distributed computing/software infrastructure

scientific data infrastructure
service-driven data e-infrastructures
Implementation Cluster for SSH

- provides solutions to a number of common issues for the five projects in social sciences and humanities
- work together along four major areas of common concern: data quality, data archiving, data access and legal and ethical issues
- The outcome of this work will form the basis for educational activities and for outreach to the communities of researchers that will benefit from these infrastructures

DASISH
EU funding: 6 M€, started in 2012
All ESFRI Life Sciences infrastructures, coordinated by EMBL

→ Interoperability across data sources and services

EU funding: 10.5 M€, started in 2012
Development of common reference model, standards, and common components for data pre-processing and post-processing

Contribution to GEOSS (Global Earth Observation System of Systems) and compliance with INSPIRE EC Directive

Large participation of ICT and e-infrastructures actors (key partners from D4SCIENCE, GENESI, EGI, EUDAT, PRACE...)

EU funding: 3.7 M€, started in 2011
All ESFRI Physics, Astronomy and Analytical infrastructures, coordinated by ESRF

Seeking synergies between 11 ESFRI Projects totalling more than 9 billion € investment volume

16 project partners from 12 MS with total op. budg.: 1.5 billion €/y
Research Data Alliance:
Common Infrastructure, Policy and Practice
Drives Data Sharing and Exchange throughout the Data Life Cycle

From Prof. Fran Berman and Prof. John Wood, Members of the RDA Council
### FP7 projects for Life Sciences

(49 projects, ~ 270 M€ of EU funding)

#### Imaging facilities
- Euro-BioImaging, neuGRID, outGRID, DECIDE, N4U

#### Biological Resource Centres
- BBMRI, EMBRC, EU-Openscreen, INFRAFRONTIER, MIRRI, EMMAservices, EMBaRC, EVA, Infravec, EUPRIMNet-II, Assemble, Infracentre-i3, BBMRI-LPC, InfraComp

#### Genomics and proteomics research facilities
- INSTRUCT, Bio-NMR, East-NMR, Pcube, BioStruct-X, ESGI, Prime-XS, eNMR, WeNMR, ERA-Instruments

#### Medical research facilities
- ERINHA, EATRIS, ECRIN, ECRIN-IA, Transvac, ULICE, EURIPRED

#### Food and agriculture research facilities
- ANAEE, NADIR, AQUAEXCEL, EPPN, Trees4Future, transPLANT, ERIN

#### Bioinformatics resources
- ELIXIR, ISBE, SLING, BioMedBridges, IMPACT, COSMOS
From FP7 to Horizon 2020

- More focused support to the implementation and operation of world-class infrastructures such as ESFRI projects
- Broader access to and deeper integration of European research infrastructures
- Foster the innovation potential of research infrastructures
- Widen the participation to pan-European research infrastructures
- More support to e-infrastructures
- Reinforce policy support to European strategy on research infrastructures
- Develop international dimension of the actions

**Excellent science**
- European Research Council
- Future and Emerging Technologies
- Marie Curie actions
- European Research infrastructures (including e-infrastructures) – 2.488 M€

**Societal challenges**
- Health, demographic change, wellbeing
- Food security, sustainable agriculture, marine - maritime research, bio-economy
- Secure, clean and efficient energy
- Smart, green, integrated transport
- Climate action, resource efficiency, raw materials
- Inclusive, innovative and reflective societies
- Secure societies
  - *Spreading excellence & Widening Participation*
  - *Science with and for Society*

**Industrial leadership**
- Leadership in enabling and industrial technologies (ICT, space, nanotechnologies, advanced materials and advanced manufacturing and processing, biotechnology)
- Access to risk finance
- Innovation in SMEs
RI Lines of Action in Horizon 2020

- Developing new world-class RI
- Integrating and operating national and international Research Infrastructures
- Fostering the Innovation Potential of Research Infrastructures and their Human Capital
- Reinforcing European Research Infrastructure Policy and International Cooperation
- Development, Deployment & Operation of e-Infrastructures
A Coherent Toolbox of Activities

- Concept
- Preparation
- Implementation
- Operation

EU Structural Funds & National Funding

ESFRI & Other World Class RI (OWCRI) of pan European interest

- Design Study
- Preparatory Phase
- Support to Implementation & Operation
  - Individual projects - Clusters

Integrating Activities
Innovation & Human resources
Policy support actions – International Cooperation
RESEARCH INFRASTRUCTURE Work Programme 2014-2015

CALL 1
Developing New World Class Infrastructures

- Design Studies
- Support to Preparatory Phase of ESFRI Projects
- Support to the Individual Implementation and Operation of ESFRI Projects
- Support to the Implementation of Cross-Cutting Infrastructure Services and Solutions for Cluster of ESFRI and Other Relevant Research Infrastructure Initiatives in a Given Thematic Area

CALL 2
Integrating and Opening Existing National and Regional Research Infrastructures of European Interest

- Integrating and Opening
- Existing National and Regional Research Infrastructures of European Interest

CALL 3
E-Infrastructures

- Managing, Preserving and Computing with Big Research Data
- E-Infrastructures for Open Access
- Towards Global Data E-Infrastructures: Research Data Alliance
- Pan-European High Performance Computing Infrastructure and Services
- Centres of Excellence for Computing Applications
- Network of HPC Competence Centres for SMEs
- Provision of Core Services Across E-Infrastructures
- Research and Education Networking – GEANT
- E-Infrastructures for Virtual Research Environments (VRE)

CALL 4
Support to Innovation, Human Resources, Policy and International Cooperation for Research Infrastructures

- Innovation Support Measures
- Innovative Procurement Pilot Action in the Field of Scientific Instrumentation
- Strengthening the Human Capital of Research Infrastructures
- New Professions and Skills for E-Infrastructures
- Policy Measures for Research Infrastructures
- International Cooperation for Research Infrastructures
- E-Infrastructure Policy Development and International Cooperation
- Network of National Contact Points
Call 1 - Developing New world-class RI

Design & Preparatory Phases

To help Europe to respond to challenges in science, industry & society:

• Support the conceptual or technical design of new research infrastructures, which are of a clear European dimension and interest (topic 1):
  - bottom-up process

• Support the preparatory or pre-implementation phase of ESFRI projects (topic 2):
Call 1 - Developing New world-class RI

Implementation & Operation Phases

To facilitate and support the implementation, long-term sustainability and efficient operation of the ESFRI & OWCRI:

• Individual ESFRI projects and selected OWCRI with established (or establishing a) legal structure and governance such as ERIC (topic 3):
  ➢ linked to prioritisation exercise

• Clusters: joint activities and implementation of common solutions for pan-European RI initiatives in specific domains (topic 4):
  ➢ targets ESFRI together with OWCRI, ERICs, IA, e-infrastructures
Exploit synergies for joint activities, optimise technological implementation of common solutions, ensure a larger harmonisation, interoperability between research facilities

- **Centred around ESFRI projects but involving other relevant pan-European RI initiatives**

- **Gathering critical mass in a specific thematic area for the implementation of a coherent set of common activities:**
  - Development of common critical components for data handling and/or common devices
  - Development of services interoperability and common data and access policies
  - Development of the innovation capacities of RI
  - Training of RI managers

- **Including key representatives of the involved RI initiatives**
Time schedule

• Publication first calls: 11 December 2013

• Deadlines in 2014:
  15 April 2014 : e-Infrastructure for open access (13 M€)
  14 May 2014 : NCP network (2 M€)
  2 September 2014:
  • Design studies (15 M€), Clusters (80 M€), Integrating Activities (140 M€),
  • e-Infrastructures for Big Data (55 M€), RDA (4 M€), HPC (15 + 2 M€),
  • Core services (6 M€), GEANT FPA

• Deadlines in 2015:
  14 January 2015 :
  • Preparatory Phase (14 M€), Individual support to ESFRI (90 M€),
  • Centres of excellence for computing applications (40 M€), VRE (42 M€),
  • PCP/PPI pilot for instrumentation (14 M€); e-skills (2,5 M€)
Thank you for your Attention!