The European Interoperability Reference Architecture (EIRA)

Dr. Raul Abril, European Commission
Warsaw, Poland
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The context of EIA in the ISA Programme
IOP is the independent variable [of performance/economic variables]

H1: “There is a positive correlation between IOP and [performance variable] of public service delivery to public administrations citizens and businesses”

H2: “There is a negative correlation between IOP and costs of public service delivery for public administrations, businesses and citizens”
<table>
<thead>
<tr>
<th>Action number</th>
<th>Action name</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Promoting semantic interoperability amongst the European Union Member States</td>
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<tr>
<td>1.2</td>
<td>Access to base registries</td>
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<tr>
<td>1.3</td>
<td>Catalogue of services</td>
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<td>1.4</td>
<td>ECAS-STORK Integration</td>
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<tr>
<td>1.5</td>
<td>STORK Sustainability</td>
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<tr>
<td>1.6</td>
<td>Common Infrastructure for Public Administrations Sustainability</td>
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<td>1.7</td>
<td>ePRIOR</td>
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<td>1.8</td>
<td>Trusted Exchange Platform (E-TrustEx)</td>
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<td>1.9</td>
<td>Supporting tools for TSL and e-signature creation/verification</td>
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<tr>
<td>1.10</td>
<td>Internal Market Information (IMI) systems</td>
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<td>1.11</td>
<td>Interoperable and Generic Notification Services (GENIS)</td>
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<tr>
<td>1.12</td>
<td>Open Source Software platform for online collection of statements of support for European citizens' initiatives</td>
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<tr>
<td>1.13</td>
<td>LEOS - Legislation Editing software</td>
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<td>1.14</td>
<td>Cross Sector SOLVIT</td>
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<td>1.15</td>
<td>Open Government Data</td>
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<td>1.16</td>
<td>Development of key IT components for the establishment of the Common information sharing ENVIRONMENT (CISE) for the surveillance of the EU maritime domain</td>
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<tr>
<td>1.17</td>
<td>Re-usable Inspire reference platform</td>
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<td>1.18</td>
<td>Federate Managed Authentication Services for ECAS</td>
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<td>PEPPOL Sustainability</td>
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<td>1.20</td>
<td>Application of EU law: provision of cross-sector communication and problem solving tools</td>
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<td>1.21</td>
<td>European Legislation Identifier</td>
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<td>2.1</td>
<td>Elaboration of a common vision for an European Interoperability Architecture (EIA)</td>
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<tr>
<td>2.2</td>
<td>CAMSS - Common Assessment Method Standards and Specifications</td>
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<td>2.3</td>
<td>PKI Services</td>
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<td>2.4</td>
<td>Data communication network service (sTESTA)</td>
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<td>CIRCABC</td>
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<td>2.6</td>
<td>Interactive Policy Making (IPM)</td>
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<td>2.7</td>
<td>Your Europe - Facilitating the re-use of content from National portals</td>
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<td>2.8</td>
<td>Machine Translation Service by the European Commission</td>
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<td>2.9</td>
<td>Document repository services for EU policy support</td>
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<td>2.10</td>
<td>Multisectorial crisis and business continuity services</td>
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<td>2.11</td>
<td>Promoting consistent EU e-procurement monitoring and performance</td>
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<td>2.12</td>
<td>eHealth European Interoperability Framework</td>
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<td>Action number</td>
<td>Action name</td>
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<tr>
<td>2.13</td>
<td>Establishment of a European Union Location Framework</td>
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<td>2.14</td>
<td>Assessment of trans-European systems supporting EU policies</td>
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<td>2.15</td>
<td>Interoperability agreements on electronic document and electronic file</td>
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<td>3.1</td>
<td>Assessment of ICT implications of EU legislation</td>
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<td>4.1.1</td>
<td>Raising Interoperability Awareness - Communication activity</td>
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<tr>
<td>4.1.2</td>
<td>Interoperability Maturity Model</td>
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<tr>
<td>4.2.1</td>
<td>Integrated Collaboration Platform - Joinup</td>
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<td>4.2.2</td>
<td>Community building and effective use of the collaborative platforms</td>
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<td>4.2.3</td>
<td>National Interoperability Framework Observatory (NIFO)</td>
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<td>4.2.4</td>
<td>European Federated Interoperability Repository (EFIR)</td>
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<td>4.2.5</td>
<td>Sharing and re-use strategy</td>
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<tr>
<td>4.2.6</td>
<td>Interoperable test beds</td>
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</table>
2.1 EIA Elaboration of a common vision for an EIA in ISA Value chain

MAPPING OF ISA ACTIONS TO THE ISA VALUE CHAIN

- 3 Actions
  - Structuring and strategic activities
  - Collection and assessment of interoperability solutions

- 3 Action
  - Mapping solutions into a cartography
  - Identifying missing parts
  - Setting the interoperability agenda

- 6 Actions
  - Sharing of solutions / Motivating and monitoring reuse
  - Support the development of missing parts / Support common services
  - Community building / Raising awareness

- 9 Actions

- 4 Actions

- 2 Actions

- 2 Actions
2.14 TESs Assessment of Trans-European networks supporting EU policies in ISA Value chain

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- **9 Actions**

- **23 Actions**

- **4 Actions**

- **2 Actions**
Promoting Interoperability in Europe’s E-Government

Our ability to move from an information society to a “smart” society will increasingly rely on interoperable e-government.
Update on pilots
We invited 3 MSs and 3 DGs to conduct a pilot of EIRA and CarTool:

- To gain general **insight** and **hands-on experience** with the EIRA and the CarTool (PoC) in their specific environment;

- To work with a **use case** that they selected to maximise the value that they can obtain from their participation in the pilot. For example, **potential benefits** can include a) the documentation of an existing interoperable solution or b) the acceleration of the design of a new interoperable solution or c) to the rationalization of your IT portfolio:
  - They will have the opportunity to **influence** and **contribute** to a joint vision of the EIRA and the EUCart by providing feedback to the EIRA and the CarTool (PoC) and by providing **visibility** to their reusable solution building blocks by including them in the EUCart;

- To provide **visibility** to their activities within the ISA Programme and, if convenient for them, to a broader audience (published on Joinup).
Examples of feedback statements we captured from the pilot participants:

“Promotes IOP“
“Helps reuse”
“It was a very valuable modelling experience“
“Useful structure and definition of an SAT”
“A richer metamodel on top of ArchiMate in relation to IOP”
“A awareness of the relationships between ABBs on different views”
“Controlled vocabulary (e.g. for procurement)”
“Standard for the IOP part of solutions”
“Checklist for core IOP ABBs”
“Modelling in Archi was very helpful“
“Helps to identify commonalities among solutions”
“A data mining tool ➔ automatic and proactive suggestions for portfolio management”
“Guidelines to think about all IOP levels when modelling”
“Stronger than TOGAF with respect to IOP: 4 levels and their alignment”
“Helps to differentiate between a public service’s provider and consumer and to model the agreement(s) between them”
“Helped to differentiate between a public service’s provider and consumer and to model the agreement(s) between them”
“Promotes IOP”
“Modelling in Archi was very helpful“
“Helps to identify commonalities among solutions”
All change request for the EIRA and the CarTool (PoC) are captured on JIRA issue tracer*.

<table>
<thead>
<tr>
<th>RfC type</th>
<th>EIRA</th>
<th>CarTool (PoC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolved</td>
<td>144</td>
<td>10</td>
</tr>
<tr>
<td>Open</td>
<td>16</td>
<td>60**</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>70</td>
</tr>
</tbody>
</table>

* We can provide the analysis of change requests on request.

** The identified functionalities of the CarTool (PoC) will be implemented as Joinup Cartography services.
• **ArchiMate alignment**: EIRA is aligned with ArchiMate 2.1 and its concepts and relations. Usage of Archi as a modelling tool (syntax error-free model).

• **Two new views**: EIRA high-level overview and interoperability specification underpinning view.

• **Restructuring of views**: Organisational and semantic views have been restructured. Several architecture building blocks were moved from the Technical application view to the Technical infrastructure view.

• **Improved definitions**: Definitions of architecture building blocks have been enhanced and aligned.

• **ADMS alignment**: Attributes of the building blocks are aligned with ADMS-AP properties.

• **Improved EIF alignment**: The EIRA now offers the possibility to capture how interoperability specifications are aligned to EIF principles.

• **EIRA overview document**: Provides an overview on the EIRA, including definitions of the EIRA’s underlying key concepts, ArchiMate notation and modelling guidelines.

• **EIRA model for Archi and as an HTML-version**: replace the simple Visio diagrams (views) and Excel spreadsheet (ABB definitions).

• **EU regulation**: the EIRA is compliant with EU regulation.
1. **6 diagrams**: 4 views (Legal, Organisational, Semantic, Technical (Apps & Infra), 1 high-level overview and 1 interoperability specification underpinning view

2. **140 Architecture Building Blocks (ABBs)**: e.g. Public Policy, Public Service, Interoperability Agreement, Data and Interoperable European Solution

3. **200 relationships between different ABBs.**

4. **18 links between the different views**: ABBs are related across the different EIF interoperability levels

5. **76 pages**: EIRA overview document.
Views modelled in Visio, using some ArchiMate shapes.

Separate Excel file containing definitions.

Simple PowerPoint providing an introduction.

Initial draft that has not been tested.

Views modelled in Archi, ensuring ArchiMate compliance. HTML version.

Definitions are integrated in Archi model. ADMS-compliant properties. Ability to export

Extensive EIRA overview documentation.

More mature version that has been tested and improved.
1. The pilot participants’ beliefs on the potential value of the EIRA

Based on my pilot experience, I believe that the EIRA has potential value for...

- Designing and documenting solution architectures
- Comparing solution architectures
- Creating solution portfolios
- Managing solution portfolios
- Rationalising solution portfolios
- Supporting impact assessments on ICT

Scale

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>6</td>
<td>Agree</td>
</tr>
<tr>
<td>5</td>
<td>Somewhat agree</td>
</tr>
<tr>
<td>4</td>
<td>Neither agree or disagree</td>
</tr>
<tr>
<td>3</td>
<td>Somewhat disagree</td>
</tr>
<tr>
<td>2</td>
<td>Disagree</td>
</tr>
<tr>
<td>1</td>
<td>Strongly disagree</td>
</tr>
</tbody>
</table>
2. The pilot participants’ beliefs on the potential value of the EIRA supporting interoperability and to contribute to cost and time saving (includes previous results for comparison).

Based on my pilot experience, I believe that the EIRA has potential value for...
EIRA presentation
European Interoperability Strategy (EIS)
Governance and strategy

European Interoperability Framework (EIF)
Framework and principles

European Interoperability Reference Architecture (EIRA)
Guidelines and Implementation
Alignment between EIF and EIRA

EIF Framework

- Political Context
  - Legal Interoperability
    - Legislative Alignment
  - Coordinated processes in which different organisations achieve a previously agreed and mutually beneficial goal
  - Precise meaning of exchanged information which is preserved and understood by all parties
  - Planning of technical issues involved in linking computer systems and services

EIRA Guidelines

- Interoperability specification view
  - Organisational view
    - Interoperability late stage alignment
    - Technical view - infrastructure
      - Digital Service Infrastructure
The EIRA v0.9.0 beta consists of the following release components:

1. **EIRA_v0.9.0_beta_ArchiMate_model.ARCHIMATE**: Archi file containing the EIRA ArchiMate model.

2. **EIRA_v0.9.0_beta_ArchiMate_model.HTML**: HTML version of the EIRA ArchiMate model.

3. **EIRA_v0.9.0_beta_Overview.PDF**: PDF document containing an introduction to the EIRA, including its key concepts, used ArchiMate notation, tool support, and views.

4. **EIRA_v0.9.0_beta_Release document set.ZIP**: Zip file containing each of the above mentioned files.

5. **EIRA_v0.9.0 beta_Release_notes.PDF**: PDF document containing the release notes.

The release components can be found in the respective release folder under the following link*: [https://joinup.ec.europa.eu/asset/eia/description#release](https://joinup.ec.europa.eu/asset/eia/description#release)

* The link points to a directory containing all EIRA releases, including the development version (e.g. 0.9.0).
Online website:
Overview on the Cartography (EUCart and CarTool)
Active elements

- Integrates the different views as active elements
- Clicking a view’s name opens the corresponding zoomed view
Hover over

- Definitions displayed when hovering over a building block

Active elements to build a query

- Each zoomed view shows a set of building blocks
- Building blocks can be added to and removed from query by clicking them
Query builder

• Track the current selection
• Validate the query before launching it
  • Fieldnames for the selected building blocks
  • Additional rows to filter active selection
• Add or remove elements using dropdown list
  • Current selection in green, others in grey
  • “Ctrl” to select multiple building blocks
  • “Eraser” icon to remove entire sections
• Lookup elements using search box
  • Match elements as you type
  • Add elements directly to query builder
Launch query

- Execute query for selected building blocks
- Switch to output view to display the solutions matching the selected criteria

Toggle instances

- Display matching solutions on the building blocks of the current zoomed view itself
- Only advised when filtering is performed as this reduces the number of values
**Update query**

- Select the building blocks in the selection menu (“Ctrl” and “Shift” for multiple)
- The query built via the zoomed views’ query builder is re-executed
- “Clear Selection” to remove all current query elements
- “Toggle building block descriptions” to show the selected building blocks’ description in a separate table (same information as the “Hover over” function)
Drag and drop

- Customise output table by moving columns to a preferred order

Filtering

- Create specific reports filtered according to parameters
- Select specific values in the retrieved data (undo by clicking “eraser”)
Positioning of the EIRA and the Cartography
EIRA provides a common core of context-neutral architecture building blocks

1. **EIRA**: context-neutral architecture building blocks (ABBs). Focused on interoperability.

2. **Solution architecture template**: specific solution adding further details to enable solution designs

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Solution Architecture templates (e.g. e-ID) with additional specific ABBs

Core Reference Architecture: EIRA – minimal cross-sector interoperability
In parallel to the ABBs, EIRA SBBs are TOGAF SBBs.
EIRA’s positioning within TOGAF’s Enterprise Continuum
Next steps

1. EIRA development
   1. Analyze results public consultation on EIRA v0.9.0 beta
   2. Release of EIRA v1.0.0 stable (*December 2015*)
The EIRA JoinUp community

European Interoperability Architecture (EIA)

General introduction

Overview of the EIRA

Releases

# Expected benefits of the EIRA

<table>
<thead>
<tr>
<th>Designing</th>
<th>Accelerate the design of systems that support the delivery of interoperable digital public services (across borders and sectors).</th>
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</thead>
<tbody>
<tr>
<td>Assessing</td>
<td>Provide a reference model for comparing existing architectures in different policy domains and thematic areas, to identify focal points for convergence and reuse.</td>
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<tr>
<td>Communicating and Sharing</td>
<td>Help documenting the most salient interoperability elements of complex systems and facilitate the sharing of reusable solutions.</td>
</tr>
<tr>
<td>Discovering and Reusing</td>
<td>Ease the discovery and reuse of interoperability solutions through the Cartography – Cart in Joinup website.</td>
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</table>
EIRA and CarTool use-cases

- Designing
  - Design solution architecture (templates)
  - Design reference architectures
  - Create portfolio

- Communicating and Sharing
  - Support Impact Assessment on ICT
  - Document interoperability solutions

- Assessing
  - Compare reference architectures
  - Compare solution architectures
  - Rationalise portfolio
  - Manage portfolio

- Discovering and Reusing
  - Search for interoperability solutions
## Contact us

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Raul Abril  
*Raul-Mario.ABRIL-JIMENEZ@ec.europa.eu*

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## For more information

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<tr>
<td>EIA project collaborative space</td>
<td><a href="https://webgate.ec.europa.eu/CITnet/confluence/display/EIA/EIA+Home">https://webgate.ec.europa.eu/CITnet/confluence/display/EIA/EIA+Home</a></td>
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