

Exploring JoREP 2.0: features and potential uses in the studies on Europeanisation of research activities

IRCrES-CNR, Rome – May 25-26, 2017

**PRESENTATION OF THE
TECHNICAL STRUCTURE OF JoREP 2.0 DATABASE**

Andrea Orazio Spinello



RISIS

Research infrastructure for research
and innovation policy studies



SEVENTH FRAMEWORK
PROGRAMME

Consiglio Nazionale delle Ricerche

IRCrES

ISTITUTO di RICERCA sulla CRESCITA ECONOMICA SOSTENIBILE
RESEARCH INSTITUTE on SUSTAINABLE ECONOMIC GROWTH

Contents

- Joint R&D programmes as a ‘multilevel entity’
- Programmes, funding agencies and countries
- Description of the ‘bridge structure’ of JoREP 2.0
- Information on substantive contents of the database
- Data-type of the variables and main characteristics



What JoREP 2.0 contains / 1

- JoREP 2.0 database includes **152 programmes**:
 - **99** European-level joint R&D programmes
 - ✓ which launched a call for proposal in 2013 or 2014 and in which at least one of the EU-28 countries or CH, IL, NO, TR participates (Funding data: 2010-2014);
 - ✓ which launched a call for proposal in 2008 and 2009 and to which a selection of 11 countries participates (Funding data: 2000-2009 and following years until the end of the programme; Flows to performers: 2000-2009).
 - **53** are bilateral programmes
 - ✓ which launched a call for proposal in 2008 and 2009 in which at least one of 11 selected countries participates (Funding data: 2000-2009; flows to performers: 2000-2009).



What JoREP 2.0 contains / 2

- JoREP defined a **set of descriptors characterising the joint R&D programmes** and the **organisations** leading different processes into the programmes
- Features of programmes are collected for each year of implementation, while **funding data are available from 2014 backwards to the start of the programme (until 2000)**.
- Most of the descriptors are either **numeric** or in the form of a **closed list** with predefined categories.
- Free text *remarks* have been used to highlight exceptions and cases, which do not easily fit into the categories.

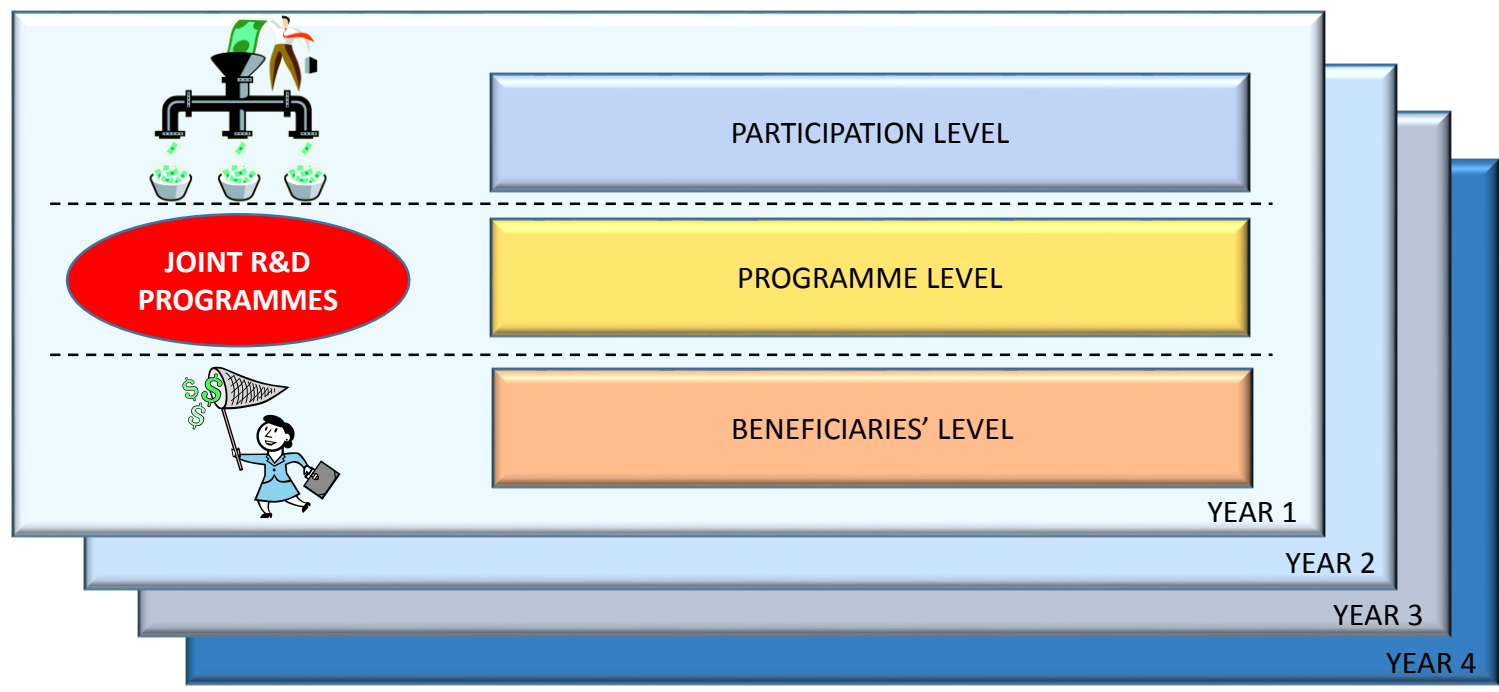


JoREP 2.0: a multilevel view to the joint R&D programmes

- The design of JoREP database is based on the nature of the main unit of analysis: **joint R&D programmes**.
- A joint R&D programme is a **multilevel entity**.
- Programmes can **change over time**: they can undergo specific transformations, potentially each year.



Joint R&D programmes: the main unit of analysis



- Internal changes within the programme along the years
- Participation and allocation dynamics might change



Joint R&D programmes, countries and funding agencies

- Panel data are stored – for each year – linking all the programmes to the **countries** participating/beneficiating and to **funding agencies involved**.

TYPES OF PARTICIPATION

A country participates with a **National funding agency**, financing / not financing the programme

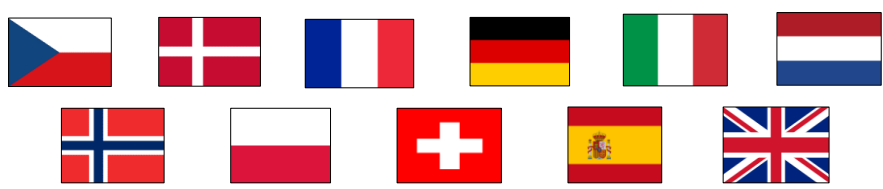
A country participates with a **supranational funding agency**, financing/not financing the programme

A country participates **without a National funding agency**, financing / not financing the programme



The 'Country' table

- The 'Country list' contains a simple list of countries (with their ISO country code).
- The geographical coverage of JOREP database includes only countries involved in the JoREP 2.0 perimeter (EU-28 + CH, IL, NO, TR).
- The country is matched with the indication of latitude and longitude of its capital city.
- Countries both as **source of funding** and **location of performers**.
- Selection of countries for the period 2000-2009



The 'Funding agencies list'

- In JoREP 2.0 a 'funding agencies list' contains a list of **348** formal organizations that manage functions for joint R&D programmes.
- **Background information for the analysis**

Funding agencies	Funding agency ID Country Acronym Name in official language Name of the agency in English Status of the agency Agency website Geographical level Agency classification Agency domain
-------------------------	---

Funding agencies ID will be re-designed in a new format according to the harmonization of research infrastructures developed within RISIS project.



A relational model for a complex structure

- System for data management which integrates and allows **several level of analysis**.
- Due to the **multilevel structure** of the joint R&D programmes and considering the need to handle **panel descriptors**, data have been stored into distinct manageable tables within a **relational structure**



The pillars of JOREP

- **Five parent tables**, divided in:
 - two tables containing the **units of analysis** including
 - data about joint R&D programmes;
 - descriptors of the national funding agencies;
 - three **auxiliary sets** containing
 - a list of countries *source of funding for/beneficiary of* the programmes;
 - a list of reference years, as a support for panel data collection;
 - an auxiliary list of currencies

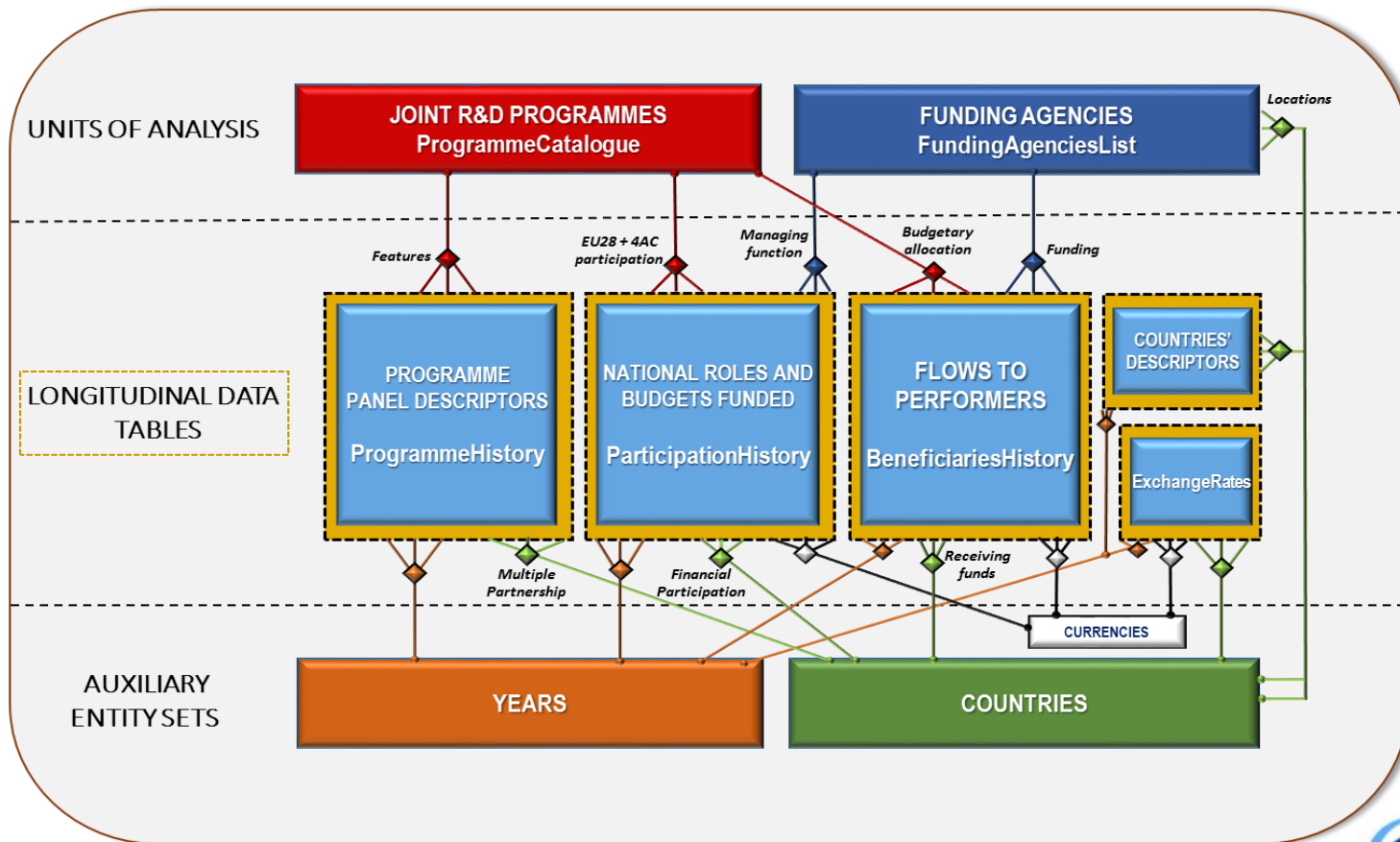


The bricks of JoREP 2.0

- **Five child-longitudinal data tables:**
 - **three junction-archives**
 - the internal characteristics of programmes;
 - the National participations in term of role and allocated budget;
 - the funding received by the beneficiaries of the programme;
 - an **auxiliary set** of panel countries' descriptors;
 - a **support panel archive** containing exchange rates.



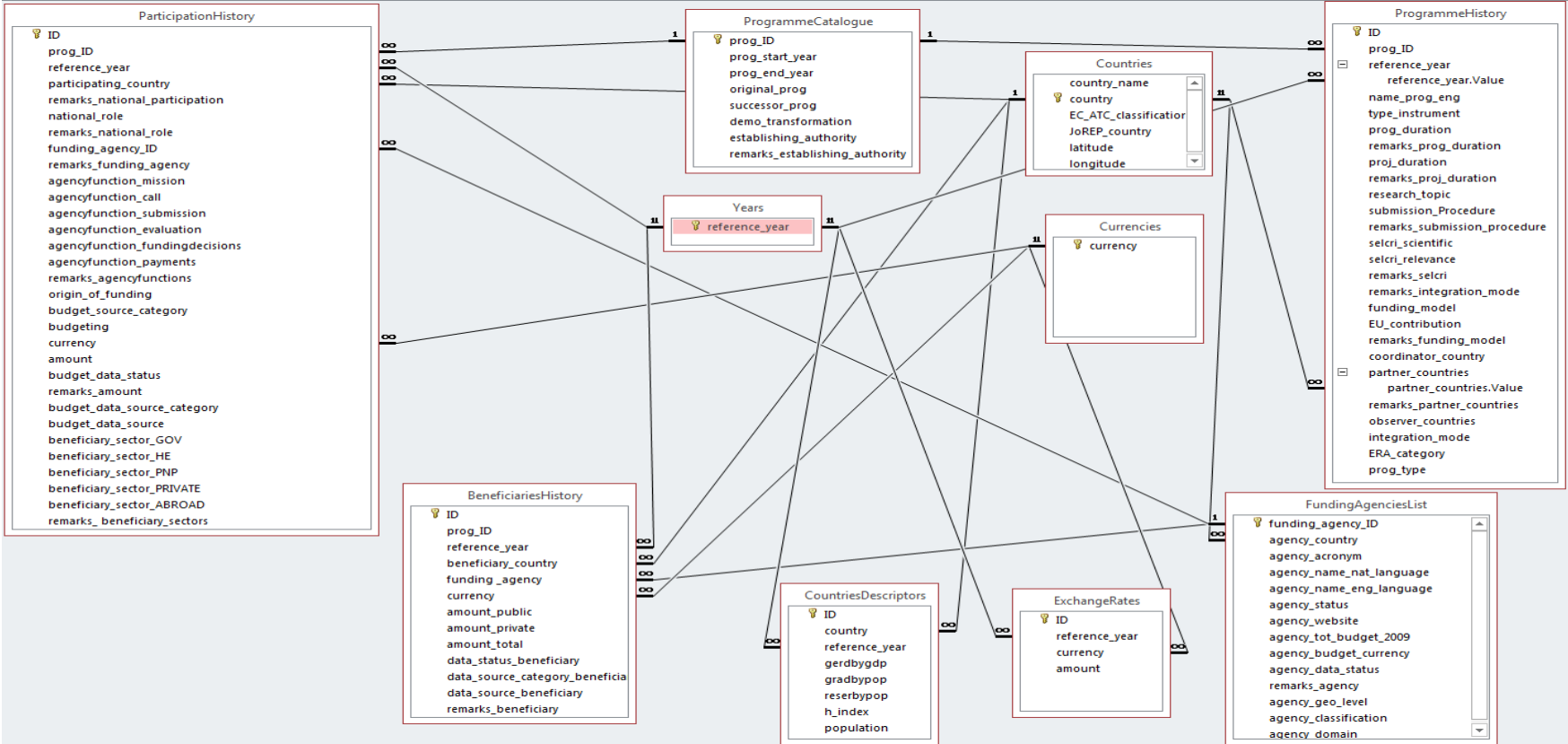
The 'bridge structure' of JoREP 2.0



A web of **one-to-many relationships (1:M)**



The dark side of JoREP 2.0



Primary keys on the 1 side and as foreign keys in the M side.



Datasheet view of the 'Programme catalogue'

- The table contains a primary key that uniquely identify each joint R&D programme as a single object.
- Provides a minimal set of attributes focused on the *basic* and *constant* information

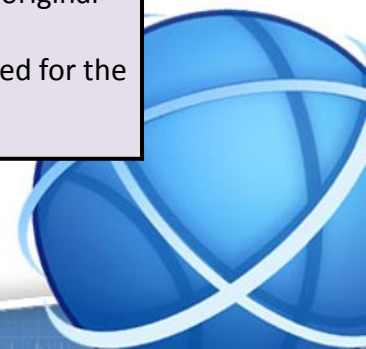
prog_ID	prog_start_y	prog_end_y	original_prog	successor_pr	demo_transformation	establishing	ren
PEU001	2005	2014			Under the code PEU001: CIRCLE and CIRCLE 2	EC	
PEU002	2006	2010				EC	
PEU003	2005	2010			After 2010, CORNET became a self-sustained p	EC	
PEU004	2008	2015			Under the code PEU004: EMIDA and ANIHWA	EC	
PEU005	2004	2008			After 2008 ERA CHEMISTRY became a self-susta	EC	
PEU006	2008	2012				EC	
PEU007	2006	2016			Under the code PEU007: ERA-IB and ERA-IB 2	EC	
PEU008	2004	2016			Under the code PEU008: ERA-NET TRANSPORT	EC	
PEU009	2006	2019			Under the code PEU009: E-RARE, E-RARE 2 and	EC	
PEU010	2008	2010			After 2010, ERASME became for two years ERA	EC	
PEU011	2005	2009				EC	
PEU012	2006	2011		PEU076	Is connected with PEU076 EraSysAPP	EC	
PEU013	2008	2013		PEU076	Is connected with PEU012 ErasyBio PEU076 Er	EC	
PEU014	2006	2010				EC	
PEU015	2009	2016			Under the code PEU015: EURONANOMED and f	EC	
PEU016	2005	2009				EC	
PEU017	2004	2013			Under the code PEU017: EUROTRANSBIO and E	EC	
PEU018	2009	2016			Under the code PEU018: HFRA IRP and HFRA IR	EC	

- Stores information on DEMOGRAPHY



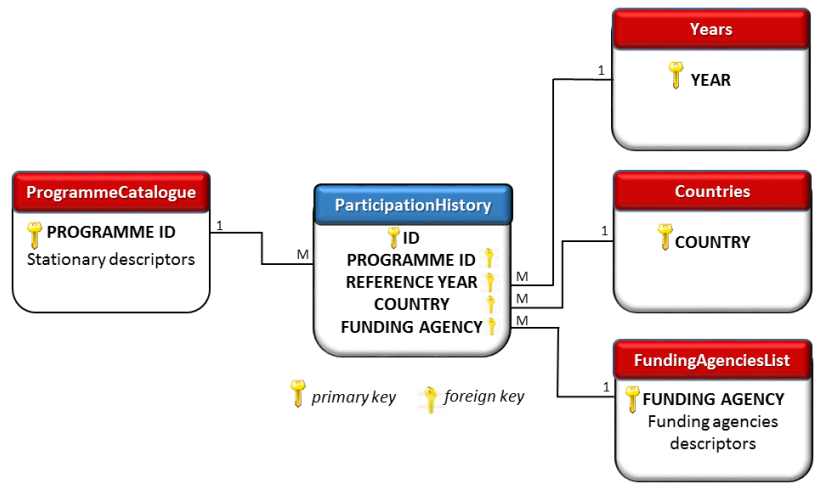
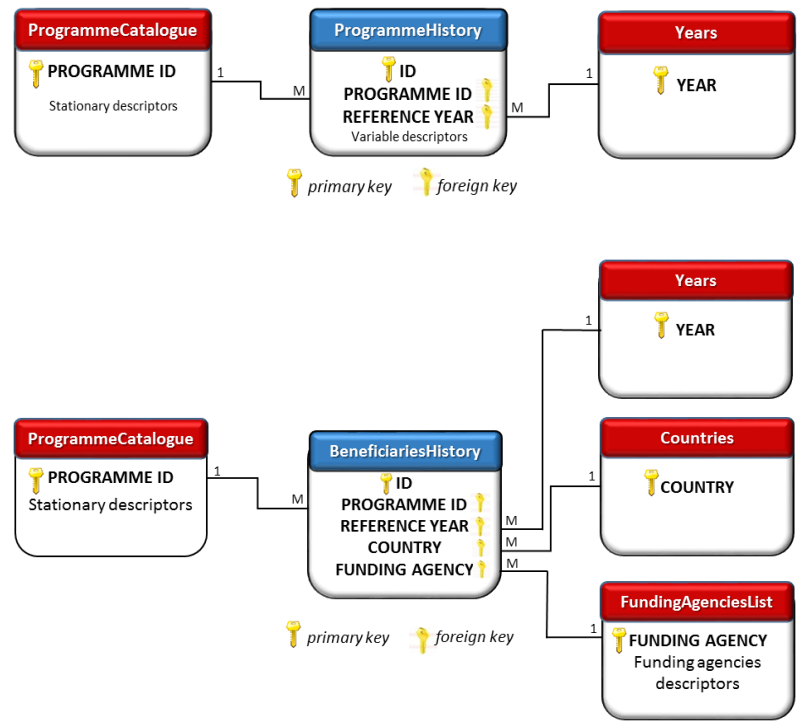
Demographic rules

Demographic Event		Decision about identifier (ID)
<p>Creation of a new joint R&D programme.</p> <p>Entry of a new funding agency.</p>	<p>Closure of an existing joint R&D Programme.</p> <p>Modification of status of a funding agency</p>	<p>New independent identifier code (ID) assigned in the case of entry.</p> <p>Identifiers of disappearing units are reserved and not reused.</p>
<p>Merger between two joint R&D programmes / funding agencies in a new joint R&D programme/funding agency (with new name).</p>	<p>Split of an existing joint R&D programme / funding agency into two or more independent joint R&D programmes /funding agencies</p>	<p>New independent identifier (ID) assigned analogously to entry.</p> <p>Identifiers of antecedent programmes/agencies are reserved and not reused.</p>
<p>Take-over of one programme by another one (death of the programme which was taken over, the taking over programme continues to exist). The new programme retains the identity of the programme taking over.</p>	<p>Spin-out (Spin-off). Split-off of a part of a programme to become a separate programme. Old programme exists unchanged, new programme has new name</p>	<p>In the case of take-overs, the ID of the dominant programme taking over another will be held. The identity of the programme taken over is reserved and not reused.</p> <p>In the case of spin-outs, the ID of the original programme will continue. Analogously to a birth, a new ID is created for the new spinning out.</p>



The 'Programme Catalogue' and its child tables

- Each record in the *ProgrammeCatalogue* is linked with functionally dependent rows of longitudinal data tables, named *ProgrammeHistory*, *ParticipationHistory*, *BeneficiariesHistory*.



ParticipationHistory and BeneficiariesHistory are linked also with the 'Funding agencies list'



Programme History

- The table about programme history contains only **descriptors at the level of the programme.**
- The table will keep track of the characteristics of joint R&D programmes in its by-year evolution.

<i>Descriptor</i>	<i>Level</i>	<i>Type</i>	
Programme start year	Programme-level	Stationary	PARENT TABLE
Programme end year	Programme-level	Stationary	
Original programme	Programme-level	Stationary	
Successor programme	Programme-level	Stationary	
Establishing authority	Programme-level	Stationary	
Reference year	-	-	LONGITUDINAL TABLE
Name of the programme	Programme-level	Variable	
Type of instrument	Programme-level	Variable	
Programme duration	Programme-level	Variable	
Project duration	Programme-level	Variable	
Research topic	Programme-level	Variable	
Submission procedure	Programme-level	Variable	
Selection criteria	Programme-level	Variable	
Funding model	Programme-level	Variable	
EU contribution	Programme-level	Variable	
Coordinator country	Programme-level	Variable	
Partner countries	Programme-level	Variable	
Observer countries	Programme-level	Variable	
Mode of integration	Programme-level	Variable	
ERA category	Programme-level	Variable	
Programme type	Programme-level	Variable	



Datasheet view of Programme History

- Datasheet of programme history displays contents in a row-and-column format similar to an **Excel worksheet** without transformations or filtering.

ID	prog_ID	reference_year	name_prog_eng	type_instrument	prog_durati	remarks_prog_durati	proj_duratic	remarks_proj_duration	research
76	PEU056	2013; 2014	COFASP	ERA-NET	Limited	1 call (2014)	2-4 years	Max 36 months	08 Agriculture
77	PEU057	2010; 2011	CORE Organic II	ERA-NET	Limited	3 calls for CORE organic	2-4 years	Max 36 months	08 Agriculture
78	PEU057	2013; 2014	CORE Organic Plus	ERA-NET plus	Limited	1 call (2013)	2-4 years	Max 36 months	08 Agriculture
79	PEU060	2010; 2011; 2012; 2013; 2014	ECO-INNOVERA	ERA-NET	Limited	2 calls (2011, 2013)	2-4 years	Projects should last at least 24 months to 36 mo	02 Environment
80	PEU064	2010; 2011; 2012; 2013	ERA.Net RUS	ERA-NET	Limited	2 call (2011)	less than 2 year	Up to 24 months	horizontal
81	PEU064	2014	ERA.Net RUS plus	ERA-NET plus	Limited	1 call (2014)	2-4 years	At least 24 months but should not exceed 30 mc	horizontal
82	PEU067	2011; 2012; 2013; 2014	ERA-CAPS	ERA-NET	Limited	2 calls (2012, 2014)	2-4 years	The expected duration of projects was three ye	08 Agriculture
83	PEU069	2010; 2011; 2012; 2013; 2014	ERAFRICA	ERA-NET	Limited	1 call (2013)	2-4 years	Up to 36 months	horizontal
84	PEU070	2013; 2014	ERA-MBT	ERA-NET	Limited	1 call (2014)	2-4 years	Funding is granted by the programme for a max	02 Environment

- Each record of **ProgrammeHistory** keeps track of the characteristics of joint programmes that identify the organizational features of the programme.
- ‘Reference Year’ and ‘Partner countries’ are multivalue fields so that multiple values stored in this field can be treated independently in potential query tables



Descriptors at the level of the programme / 1

- **Type of instrument** (e.g. ERA-NET, ERA-NET plus, JPI, etc.)
- **Programme duration.** (*Limited/Periodic/Regular*)
- **Project duration.** (*Typical duration of projects funded*).
- **Research topics.** *The classification refers to the socio-economic objective of the programme, not to the actual research content.*
- **Selection criteria** This descriptor provides synthetic information on the importance of the two following criteria in the selection of projects:
 - Scientific quality.
 - Relevance to strategic or economic priorities.
- **Submission procedure.** (*Single entry point/Parallel submission*)



Descriptors at the level of the programme / 2

- **Funding model.** (*Common pot/Common pot with return rules/National pot/Mixed-mode*).
- **EU contribution.** (*yes/no*).
- **Partner countries (including coordinator) + Observer countries**
- **Mode of integration.** (*Agency, coordination, delegation, independent selection*).
- **ERA category.** This descriptor provides a general categorization of joint programmes in terms of their relationships with the European research area
- **Programme type.** The main organizational settings of joint programmes and is based on a set of other descriptions.



National participation to the programme

- *ParticipationHistory* collects data on the national participation of JoREP countries to the joint R&D programmes from the catalogue for each reference year.

<i>Descriptor</i>	<i>Level</i>
Reference year	-
Participating country	Participation-level
National role	Participation-level
Funding agency	Participation-level
Agency functions	Participation-level
Origin of funding	Participation-level
Budget source category	Participation-level
Budgeting	Participation-level
Currency	Participation-level
Amount	Participation-level
Potential beneficiary sectors	Participation-level



Datasheet view of Participation History

- The yearly dynamic of participation points out the **national funding agency** executing at least one of the programme function, including also the **budget allocated to the programme** by the National Agency or by the only Country.

prog_ID	reference_y	participatin	remarks_natio	national_rol	remarks_national_role	funding_age	remarks_fur	agencyfunct	agencyfunct	agencyfunct	agencyfunct	agencyfunct	agencyfunct	agencyfunct	remarks_agi	orig
PEU008	2008	NO		Full participati		NO-01 - RCN		Participation t	Participation t	Participation t	Participation t	yes	yes		Min	
PEU008	2009	NO		Full participati		NO-01 - RCN		Participation t	Participation t	Participation t	Participation t	yes	yes		Min	
PEU008	2009	PL		Full participati		PL-02 - NCBR	see 2.5 main cl	Participation t	Participation t	Participation t	Participation t	no	yes		MN	
PEU008	2008	UK	First year of parti	Limited partici	UK not part of the calls; ir	UK-11 - DFT		Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	More about ali	UK-
PEU008	2009	UK	First year of parti	Limited partici	UK not part of the calls; ir	UK-11 - DFT		Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	More about ali	UK-
PEU009	2006	DE		Full participati		DE-02 - PT-DLR		Participation t	Participation t	Participation t	Participation t	no	yes		BMI	
PEU009	2007	DE		Full participati		DE-02 - PT-DLR		Participation t	Participation t	Participation t	Participation t	no	yes		BMI	
PEU009	2008	DE		Full participati		DE-02 - PT-DLR		Participation t	Participation t	Participation t	Participation t	no	yes		BMI	
PEU009	2009	DE		Full participati		DE-02 - PT-DLR		Participation t	Participation t	Participation t	Participation t	no	yes		BMI	
PEU009	2007	ES		Full participati		ES-06 - ISCIII		Participation t	Participation t	Participation t	Participation t	yes	yes		Spa	
PEU009	2008	ES		Full participati		ES-06 - ISCIII		Participation t	Participation t	Participation t	Participation t	yes	yes		Spa	
PEU009	2009	ES		Full participati		ES-06 - ISCIII		Participation t	Participation t	Participation t	Participation t	yes	yes		Spa	
PEU009	2009	ES		Full participati		ES-06 - ISCIII		Participation t	Participation t	Participation t	Participation t	yes	yes		Spa	



Descriptors at the participation level / 1

- **National role.** (*Full participation / Full participation with restricted funding / Limited participation*)
- **Funding agency.** The funding agency receiving the funding amount specifically for this programme.
- **Agency functions** For each agency, indication is requested if it manages at least one of following functions:
 - Definition of the programme goals and mission.
 - Preparation and diffusion of the call.
 - Management of the submission process.
 - Evaluation and selection process.
 - Decision on which projects to fund.
 - Management of contract and payments
- **Origin of funding.** The exact origin of the budget, including the European Union budget, the national budgets and regional budgets.



Descriptors at the participation level / 2

- **Funding country.** The national state (or EU) from where funding originates
- **Budgeting.** The type of budgeting conforming to the following categories:
 - Specific budget line
 - Earmarked budget
 - Delegated budget
- **Amount.** The funding for the whole year expressed in currency units.
- **Potential beneficiary sectors.** This descriptor identifies the performing sectors that are legally entitled to get funding from the programme.



Programme beneficiaries

- Each country can benefit of a budget for many programmes, through funding agencies and budget received by a national agency may change by year.
- Thus, beneficiaries' history stores a data collection of the **budget transferred from each funding agencies to the performers.**

<i>Descriptor</i>	<i>Level</i>
Reference Year	Beneficiary-level
Beneficiary Country	Beneficiary-level
Funding Agency	Beneficiary-level
Currency	Beneficiary-level
Amount	Beneficiary-level
Data source category	Beneficiary-level
Data source	Beneficiary-level



Datasheet view of Beneficiaries' History

- In the beneficiaries' history table data are collected by year for the countries of the performing organization and disaggregated by funding agency managing resources for the programme.

ID	Programme	Beneficiary	Funding age	ReferenceYi	Currency	AmountPub	AmountPriv	AmountTot	DataStatus	DataSource	DataSource
199	PEU006	DE	EN-06 - Consor	2009	EUR	0	0	0	Available	Other source	Programme we
200	PEU006	FR	EN-06 - Consor	2008	EUR	0	0	0	Available	Other source	Programme we
201	PEU006	FR	EN-06 - Consor	2009	EUR	0	0	0	Available	Other source	Programme we
202	PEU006	IT	EN-06 - Consor	2008	EUR	0	0	0	Available	Other source	Programme we
203	PEU006	IT	EN-06 - Consor	2009	EUR	0	0	0	Available	Other source	Programme we
204	PEU006	NL	EN-06 - Consor	2008	EUR	0	0	0	Available	Other source	Programme we
205	PEU006	NL	EN-06 - Consor	2009	EUR	0	0	0	Available	Other source	Programme we
206	PEU006	UK	EN-06 - Consor	2008	EUR	0	0	0	Available	Other source	Programme we
207	PEU006	UK	EN-06 - Consor	2009	EUR	0	0	0	Available	Other source	Programme we
208	PEU006	FR	FR-08 - ANSES	2008	EUR	0	0	0	Available	Information fr	Contact with th
209	PEU006	FR	FR-08 - ANSES	2009	EUR	119.392	0	119.392	Available	Information fr	Contact with th
210	PEU006	NL	NL-14 - RIVM	2008	EUR	0	0	0	Available	Information fr	Tom van Teune
211	PEU006	NL	NL-14 - RIVM	2009	EUR	0	0	0	Available	Information fr	Tom van Teune
212	PEU006	UK	UK-06 - NERC	2008	Not applicable	0	0	0	Available	Not applicable	Not applicable
213	PEU006	UK	UK-06 - NERC	2009	GBP	1.000.000	0	1.000.000	Available	Information fr	NERC Grants di
214	PEU007	DE	DE-07a - PTJ	2006	EUR	0	0	0	Available	Information fr	PTJ
215	PEU007	DE	DE-07a - PTJ	2007	EUR	0	0	0	Available	Information fr	PTJ



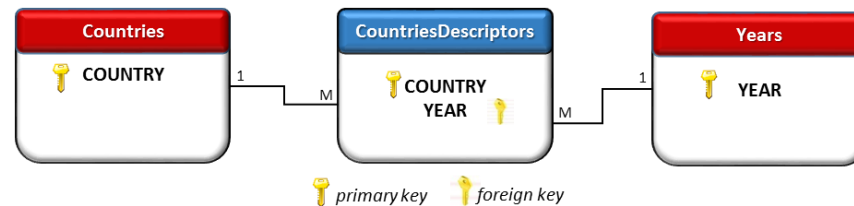
Descriptors at the beneficiaries' level

- **Beneficiary country.** Country the funding amount refers to.
- **Funding agency.** The name of the funding agency the funding originates from.
- **Currency.** The national currency used. Standard ISO currency codes is used.
- **Amount.** For each year, the volume of funding transferred to public and private beneficiaries.



Introduction of country descriptors in JoREP 2.0

- A longitudinal table of country descriptors collected from official sources has been introduced in order to favour the match of data on country participations to joint R&D programmes with internal and variable-by-year features of the 32 countries which represent the geographical coverage of JoREP 2.0



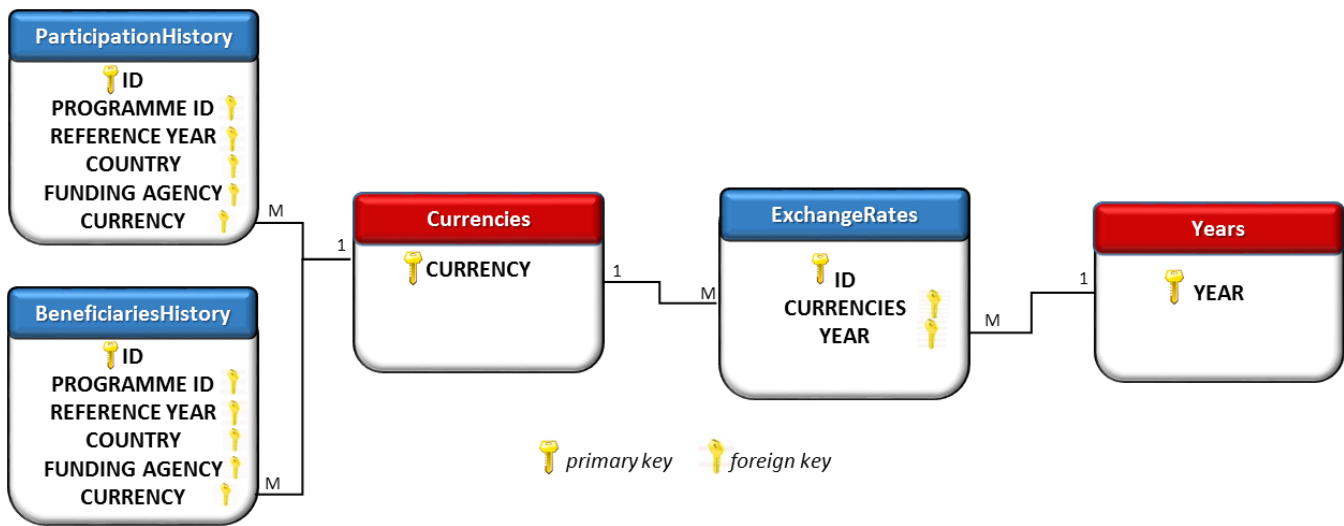
ADDITIONAL INFORMATION

- **GERD as a percentage of GDP** (source: EUROSTAT)
- **Graduates on population** (source: EUROSTAT)
- **Researchers on population** (source: EUROSTAT)
- **H-Index.** (source SCOPUS)
- **Patents on population.** (source: OECD)



Currencies and exchange rates

- A longitudinal table of exchange rates has been introduced in order to favour the conversion of monetary value in EUR. (From 2010 all values are expressed in EUR).



Summing up / 1

- Life of joint R&D programmes extends over time, carrying out specific transformations, occurring potentially **each year** and **over more levels**.
- JoREP 2.0 was built as a **relational database model** in order to better account for the storage and visualization of time-related programme data distributed over more levels.



Summing up / 2

- Therefore, the sets of data refer to **panel descriptors**, placed at the same **level of the programme** as well as concerning attributes placed at **participation level** and at **beneficiaries' level**.
- JoREP 2.0 contains both **qualitative and quantitative descriptors**. The combination of these descriptors characterise the organizational forms of joint R&D programmes, the models of integration, the networks of collaboration; identify the flows of funding... and so on.

