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Reportnet Architecture Overview

InfoRAC visit to EEA

Contents

- Introduction (design principles & core technologies)
- Reportnet Applications – technology architecture
- Reportnet Applications – role in the reporting process

Introduction – background and core principles

- **Background**
  - Reportnet is a set of inter-related applications for supporting and improving environmental data reporting
  - Developed since 2000 and has been in operational use since 2002

- **Core principles**
  - Use of open source technologies
  - Use of web technologies
  - Incremental / agile development approach
  - SEIS

Introduction – Architecture and core technologies

- **Service-oriented architecture (SOA)** as the architectural style
  - Main SOA principles in focus: **reusability**, **autonomy**, **loose-coupling**

- **Core technologies**
  - Java, Python (Zope), MySQL
  - XML, RDF
  - JSON RESTful APIs, XML-RPC (legacy)
  - XQuery

Reportnet Applications Overview

[01] Reporting Obligations Database

[02] Data Dictionary

[03] Conversion Service & [04] QA Service

[05] Web Forms

[06] Central Data Repositories (CDR, MDR, BDR)

[07] Eionet Network Directory

[08] Unified Notification System

[09] Content Registry

[10] Support modules
(ACL Library, ACLAdmin, HelpAdmin, DocModule, Central Authentication Service)

Reporting Obligations Database (ROD)

- http://rod.eionet.europa.eu/
- A web-enabled database with all relevant reporting obligations and deadlines
  - Enables storing, searching, browsing and updating reporting obligations

Architectural Layer	Technologies
Presentation	• MVC-pattern • Current: Stripes • Future: Spring + Thymeleaf
Business Logic	• Java classes
Data	• MySQL
Interoperability	• RESTful API with JSON • XML-RPC

Data Dictionary (DD)

- http://dd.eionet.europa.eu
- A web-based data semantics registry for the Reportnet
  - Is used to manage data definitions (attributes and relationships), reference data, templates and schemas

Architectural Layer	Technologies
Presentation	• MVC pattern • Current: Stripes • Future: Spring with Thymeleaf
Business Logic	• Java classes
Data	• MySQL
Interoperability	• XML-RPC

Conversion and QA Service (XMLCONV)

- http://converters.eionet.europa.eu
- Data format conversions and quality assurance of the reporting data
  - Converting XML files into human friendly formats like HTML, MS Excel, PDF
  - Checking the quality of the delivered XML files (XML Schema validation & executing XQuery scripts)

Architectural Layer	Technologies
Presentation	• MVC pattern • Future: Spring • Current: Struts
Business Logic	• Java classes • XQuery engines: Saxon, BaseX
Data	• MySQL
Interoperability	• XML-RPC • RESTful API with JSON

Webforms

- http://webforms.eionet.europa.eu
- Enables the delivery of XML data using web-based questionnaires
  - Create XML file using predefined webforms
  - Upload XML and edit it with webform

Architectural Layer	Technologies
Presentation	• MVC pattern • Angular JS, XForms (legacy)
Business Logic	• Java classes
Data	• MySQL
Interoperability	• RESTful API with JSON

Central Data Repository (CDR)

- https://cdr.eionet.europa.eu
- Content management system for storing the data deliveries
  - Create XML file using predefined webforms
  - Upload XML and edit it with webform

Architectural Layer	Technologies
Presentation	• Zope CMS
Business Logic	• Python code
Data	• ZopeDB
Interoperability	• RESTful API with JSON

Content Registry (CR)

- https://cr.eionet.europa.eu
- A data warehouse which harvests metadata from the other Reportnet services
  - Structured data storage (RDF triples)
  - Users can search for the content of services in Reportnet based on their metadata

Architectural Layer	Technologies
Presentation	• MVC Pattern • Future: Spring + Thymeleaf • Current: Stripes
Business Logic	• Java classes
Data	• OpenLink Virtuoso
Interoperability	• SPARQL endpoint • XML-RPC

Eionet Network Directory, CAS, UNS

- **Eionet network directory**
  - LDAP based registry of users, organisations, and their roles
- **Central Authentication System (CAS)**
  - Single Sign-On service for Reportnet applications
- **Unified Notification Service (UNS)**
  - Notification system for authenticated users to receive notifications with events from RSS/RDF channels available in Reportnet

Reportnet Applications in the reporting process

Reporting process from Reportnet perspective

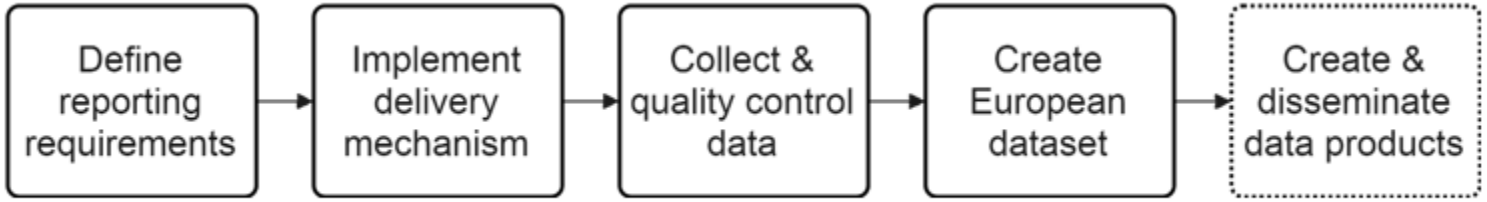
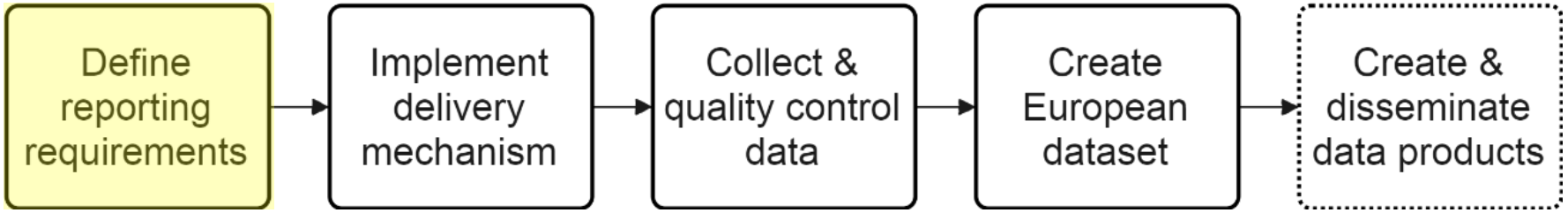
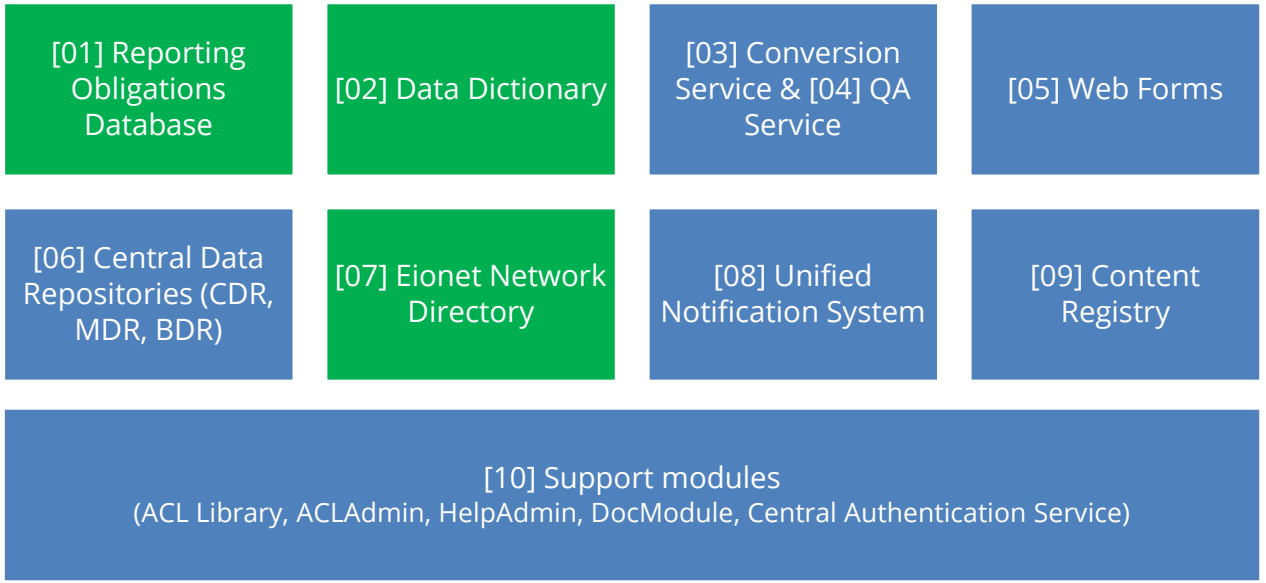


Figure 1: Reporting process

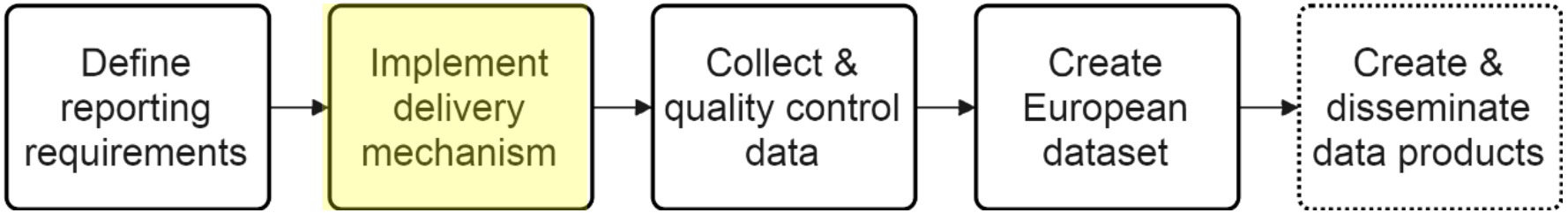
Step 1: Define reporting requirements



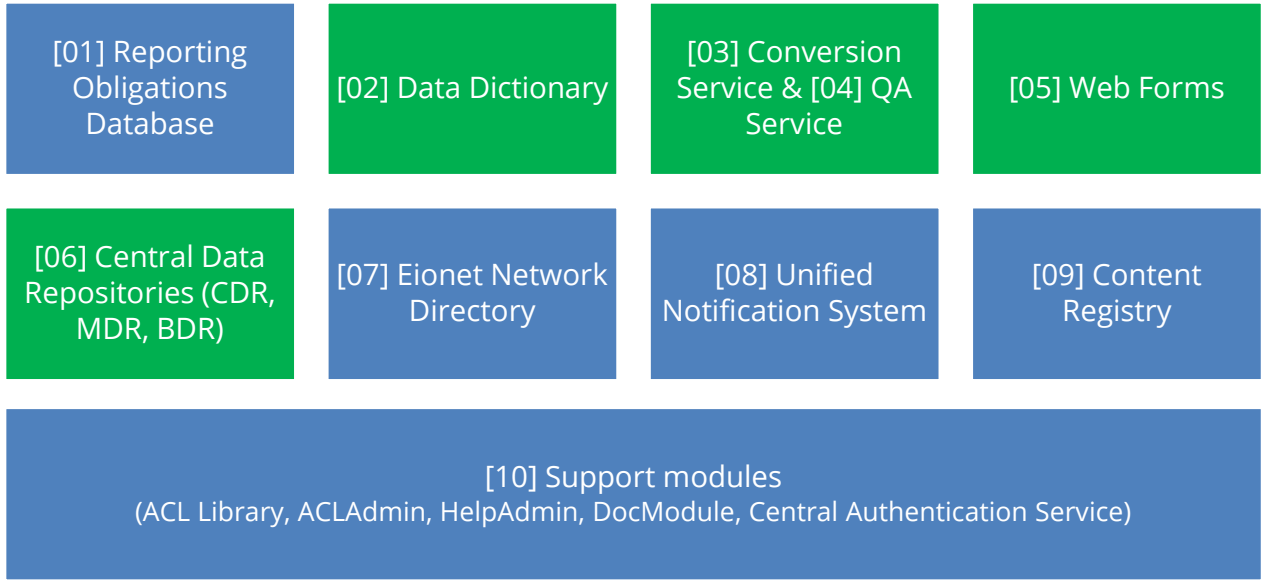
Reportnet Applications supporting this step:



Step 2: Implement delivery mechanism

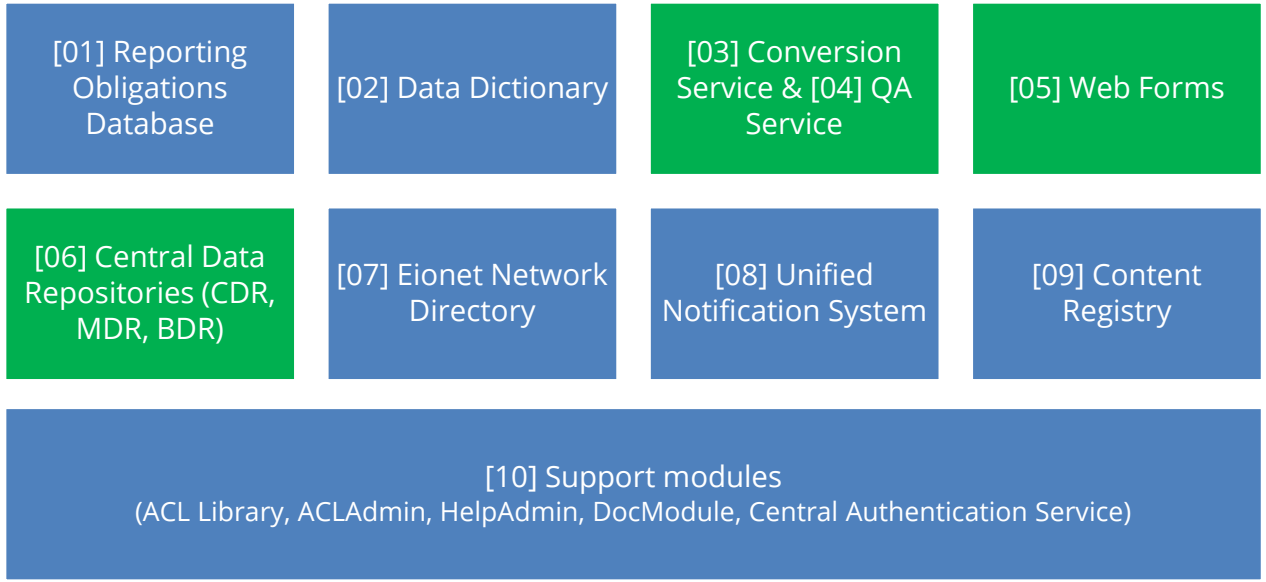


Reportnet Applications supporting this step:

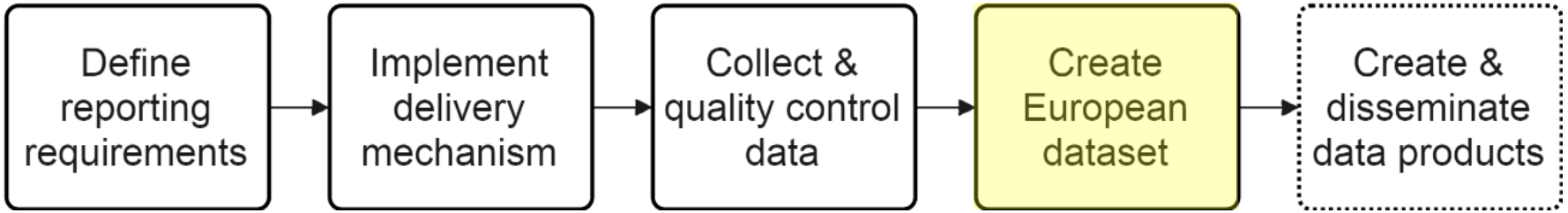


Step 3: Collect & quality control data

Reportnet Applications supporting this step:



Step 4: Create European dataset



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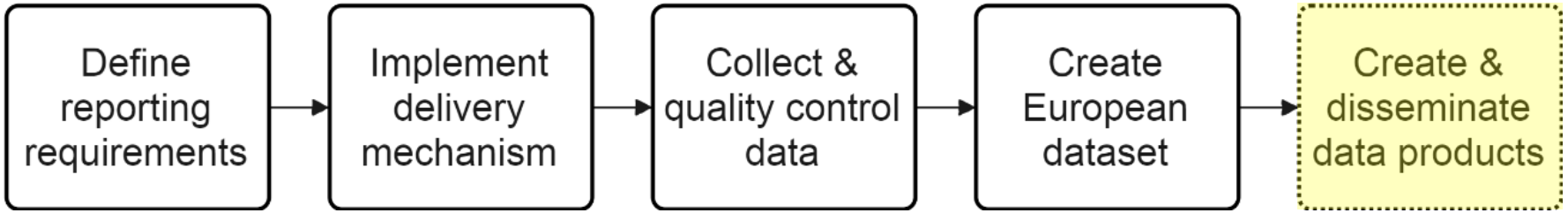
Common Workspace

Step 5: Create & disseminate data products



No Reportnet applications are supporting this step.

Products are published on EEA Data Service (http://www.eea.europa.eu/data-and-maps)

The end!

European Environment Agency