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Conference topic:

The role of CRIS in support of Plan S and transforming Scholarly Communications

TRACK:

I. Open communication, sharing, reuse and profiling of research

II. Measuring research, its quality and impact

III. Advances in research information technology

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Title

Development of Plan S monitoring and compliance tool in the context of PTCRIS for Portuguese National Science Foundation

Keywords (min 3)

PTCRIS

Data Warehouse

Business Intelligence

Plan S monitoring

Open Science Policies compliance

Abstract

The Portuguese Foundation for Science and Technology (FCT) has endorsed Plan-S since early 2021 and it is working towards implementing its obligations. To ensure an effective fulfillment of its open science policies, FCT is implementing a new monitoring and compliance tool, that will enforce the compliance with Plan-S as well as the new FCT's open access (OA) policy. This paper details FCT's approach to implement this tool and discusses the challenges of integrating information that is spread across multiple systems. The new tool will be built on top of infrastructures and services developed by FCT over the last years under the umbrella of the Portuguese Current Research Information System (PTCRIS) program. This tool comprises an operational component, integrated with the grant management system, and an analytical component, based on a Data Warehouse and Business Intelligence (DW/BI) system. The DW/BI system for the ecosystem of Science and Technology in Portugal will be developed using Kimball's Dimensional DW architecture, which advocates the incremental design and development of dimensional data marts linked by conforming dimensions. In this approach, data marts contain atomic and summarized data, corresponding to the development of elementary and derived dimensional models. Three data marts will be developed for the subject areas of funding, scientific results and for monitoring and compliance. The last data mart will calculate the compliance indicators for Plan-S as well as for FCT's OA policy. The operational component of the new tool then receives, from the analytical component, the list of scientific results per funding registry along with data regarding compliance. A list of non-compliances for each scientific result will be the basis of a notification module that will inform the principal investigator (PI) and the FCT compliance officer.

Extended abstract

Introduction

Over the last decade, funders around the world have implemented Open Science policies that aim to optimize the application and profitability of public funding in scientific research activities, providing the widest possible dissemination of the results of funded research. In September 2018, cOAlition S [1], an international consortium of research funding and performing organizations, launched Plan-S [2] which requires that, from 2021, scientific publications that result from research funded by public grants must be published in compliant Open Access (OA) journals or platforms. The Portuguese Foundation for Science and Technology (FCT) [3] has endorsed Plan-S since early 2021 and it is working towards implementing its obligations. To ensure an effective fulfillment of its open science policies, FCT is implementing a new monitoring and compliance tool, that will enforce the compliance with Plan-S. This paper details FCT's approach to implement this tool and discusses the challenges of integrating information that is spread across multiple systems.

The Monitoring and Compliance tool

The new tool will be built on top of infrastructures and services developed by FCT over the last years under the umbrella of the Portuguese Current Research Information System (PTCRIS) program [4]. Launched in 2014, PTCRIS aims at creating and sustaining the development of an integrated and coherent ecosystem at the national level [5]. By promoting a wide and effective integration of several key information systems, PTCRIS contributes to lighten the administrative burden that lies on researchers and streamline management and scientific production processes through access to an authoritative, complete and reliable source of information. Figure 1 depicts the PTCRIS ecosystem. All regulatory framework and infrastructures highlighted in the figure are already deployed except the research and infrastructure system. At the services level, the national CV platform (CIENCIAVITAE [6]), the grant management system (MyFCT [7]) are live and several national and local CRIS are interoperable using PTCRIS infrastructures and systems.
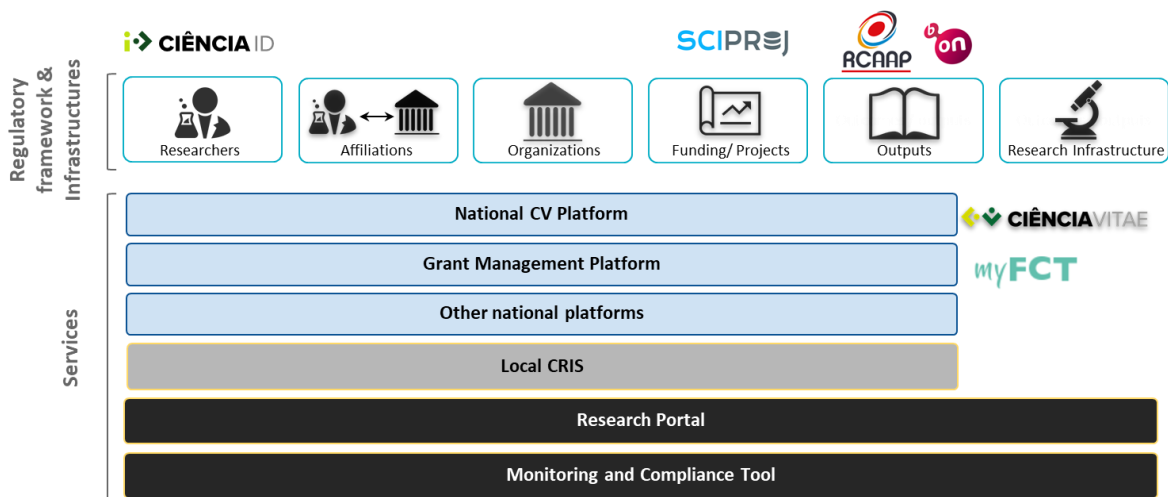
Figure 1. PTCRIS ecosystem

FCT also manages the online library of knowledge (b-on) [8] which is the national consortium that ensures the access to scientific international content is available to the Portuguese research community. During 2021, FCT was able to negotiate transformative agreements with publishers which will allow that 60% of the Portuguese scientific outputs will be published without cost to authors. This will enable one route of compliance with Plan-S. Another possible route is the use of open access repositories. FCT is also responsible for managing the national initiative for open access, and the Open Access Scientific Repositories of Portugal (RCAAP) [9]. The full integration of RCAAP with the PTCRIS infrastructure will be completed during 2022.

Simultaneously, during 2022, FCT aims to implement the monitoring and compliance tool. This tool comprises an operational component, integrated with the grant management system, and an analytical component, based on a Data Warehouse and Business Intelligence (DW/BI) system. The goal of the DW/BI system is to analyze the funding that the Science and Technology (S&T) ecosystem in Portugal receives, and consequently the scientific outputs produced by the actors of the ecosystem, namely researchers and S&T institutions, covered by a research and development (R&D) funding programme promoted by a funding entity. The DW/BI system will enable the monitoring of scientific outputs in open access, fulfilling three specific objectives: (1) monitoring OA trends and spending on APCs (article processing charges); (2) monitoring and compliance with Plan-S; and (3) Monitoring of the transformative agreements with b-on.

The DW/BI system for the ecosystem of S&T in Portugal will be developed using Kimball's Dimensional DW architecture [10], which advocates the incremental design and development of dimensional data marts linked by conforming dimensions. In this approach, data marts contain atomic and summarized data, corresponding to the development of elementary and derived dimensional models. Figure 2 presents the high-level architecture of the DW/BI system, with four main levels: (1) source systems; (2) the ETL (extract, transform, and load) processes; (3) Data Warehouse, or data presentation layer, organized by subject areas or data marts; and (4) BI applications, i.e., the data exploration layer for decision-makers and business users, comprising dashboards and a collection of specific reports.
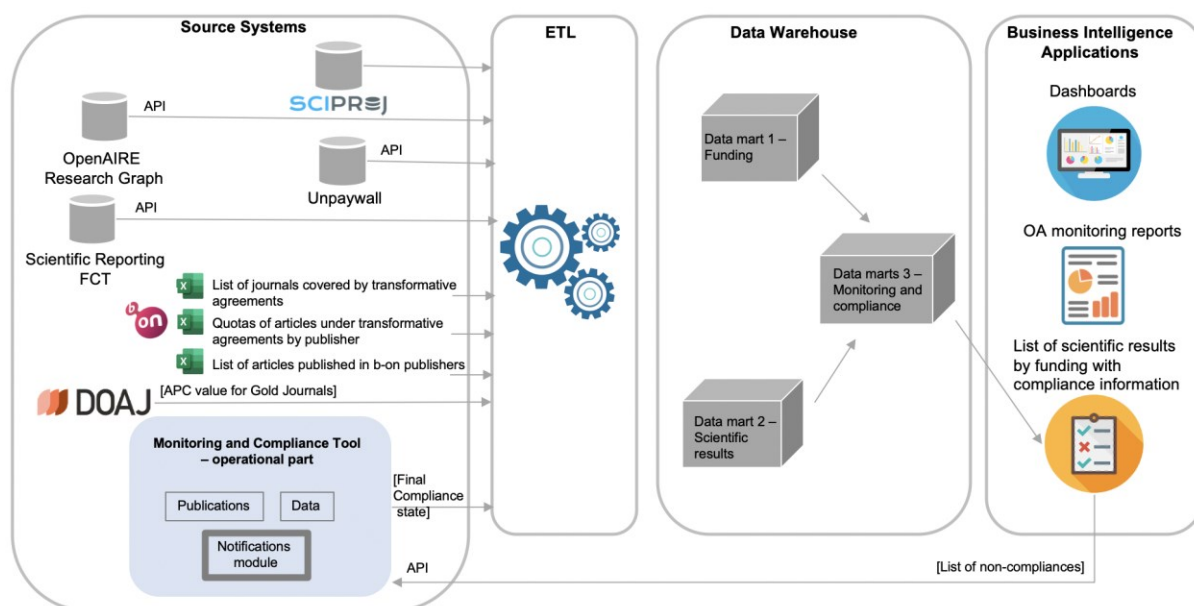
Figure 2. High-level architecture of the Monitoring and Compliance tool: analytical part (DW/BI system) and operational part

Three data marts will be developed for the subject areas of funding, scientific results and for monitoring and compliance. The last data mart will calculate the compliance indicators for Plan-S as well as for FCT's OA policy. The data collected will allow trends to be established regarding compliance with the Plan-S and the FCT policy at the access level (e.g., the evolution over time of the percentage of FCT-funded results available in open access).

The operational component of the monitoring and compliance tool manages the non-complaint information of publications and data. Specifically, there will be a module responsible for sending notifications to the principal investigator (PI) and the FCT compliance officer. As displayed in Figure 2, the operational component receives the list of scientific results per funding registry with compliance information as well as a list of non-compliances for each publication. The treatment of non-compliances is performed in another system and it is the responsibility of the PI. The DW/BI is accountable for periodically screening the existing scientific results and update the list sent back to the operational component of the tool. The FCT compliance officer will be responsible to determine the official state of a publication (e.g., "approval of automatic compliance validation", "unable to verify") signaling the end of the compliance monitoring cycle for a publication.

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