A software pipeline for delivery of scientific results as PDS4

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Introduction:
Delivery of scientific results for a wide dissemination is a need, and a requirement for all international large projects, like those in the Horizon 2020. This is the case of UPWARDS, a project devoted to revise Mars Express observations and prepare tools and revise results in preparation for Exomars.

Such a delivery activity, in any of the standard formats, is not a trivial task and is usually very time consuming. In addition, these actions rely mostly on the science teams who should obviously use their time in other more productive and science-oriented directions.

This is the motivation for developing a user-friendly tool to facilitate the delivery of data products within UPWARDS.

PDS4 format:
Around forty datasets will be generated in the UPWARDS project. The project contemplates these deliveries to be disseminated via the Planetary Science Archive of ESA [1]. Within this project, and after discussion with the PSA, we decided to use the standard planetary data system (PDS) [2,3], in particular, its latest version, the so called PDS4 [4]. PDS4 gives guidelines for long-term archiving. PDS4 is based basically in the generation of XML files which contains information about the datasets, documentation, context or organization. As mentioned above, the generation of all these files can be a very tedious labour. How to minimize this burden of work for each individual scientist / team within UPWARDS is explained next.

A practical user-friendly approach:
For the generation of all PDS4 deliveries [5], we have created a software pipeline (Figure 1) which basically consist in two steps: (1) a front-end to be filled by the user/data generator with essential as well as optional information, and (2) a java module intended to be transparent to the user/scientist and which basically generates an structure of XML files suitable for its delivery as PDS4. As part of this last step, there is a previous loading of a set of PDS4 templates.

The software architecture is based on a Model-view-controller (MVC) pattern, so that the front-end and the processing software are decoupled. Owing this architecture, the user interface could be a web page or the example shown in the figure 2. This last interface is currently used.

In this talk we will present this tool, which is fully functional but under continuous development, and will prompt the science community to use it and to supply ideas for future extensions and improved usability.

References:

[1] https://archives.esac.esa.int/psa/#!Home%20View

[2] Data Design Working Group, PDS4 Concepts. National Aeronautics ans Space Administration, Version 1.7.0 (2016)

[3] Data Design Working Group, Proposer's Archiving Guide (PAG). National Aeronautics and Space Administration, Version 2.0 (2014)

[4] Data Design Working Group, Planetary Data System Standars Reference. National Aeronautics ans Space Administration, Version 1.4.1 (2016)

[5] http://sbndev.astro.umd.edu/wiki/PDS4_Product_Labels,_Step_by_Step
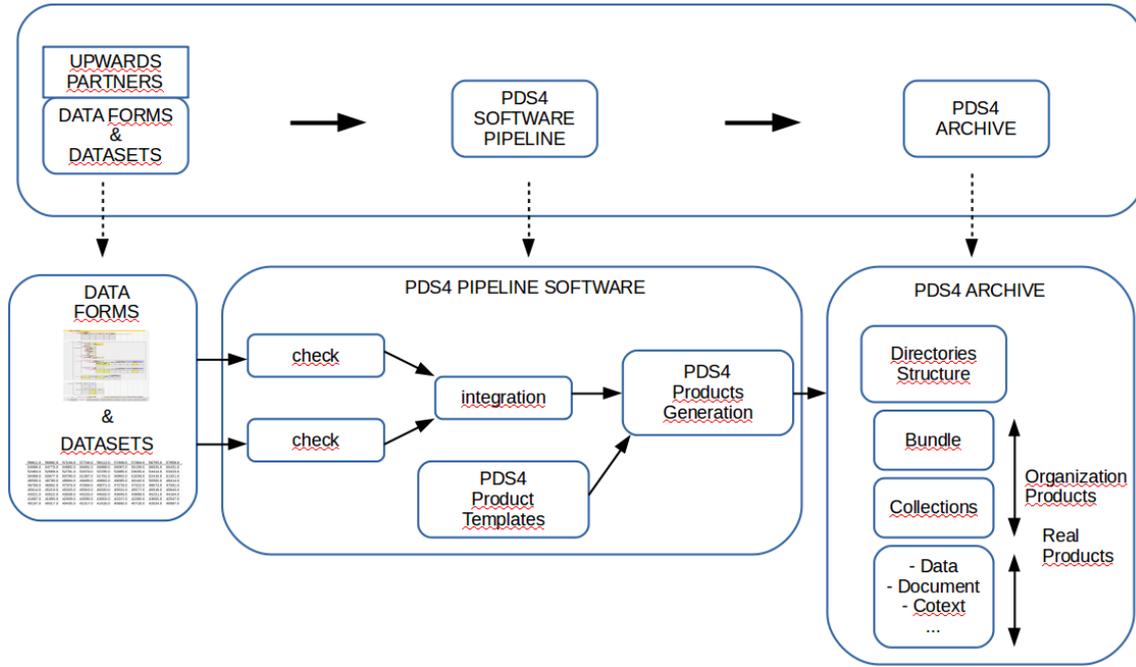
Figure 1. Illustration of the process of generation of PDS4 through the software pipeline

Figure 2. Example of an user front-end to insert data