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HOW INTELLIGENT DATA MANAGEMENT AND AR CAN HELP ASSEMBLE A SPACECRAFT

Abstract

The development of the Cooperants Smart Service "Augmented Reality for AIV Support" is intended to significantly improve the efficiency and quality of the planning, execution, communication and documentation of integration and verification processes (AIV) of various spacecraft manufacturers. The aim is to provide a software solution for the low barrier generation of AR content for various processes or process visualizations. This requires information from the design and development process of spacecraft, e.g. interface drawings and information, budgets and system requirements.

The spacecraft development process requires and generates a large amount of information that describes the system and its evolution. The handling of this information in the product development process is based on the use of various aids and tools, such as spreadsheets, text files and CAD designs. In addition, much of the production documentation is paper-based. As a result, some information has an isolated existence (data islands), i.e. information is stored and maintained in isolation from each other. Among others, this increases the risk of version conflicts when exchanging information and requires a certain amount of effort when compiling and combining information for analysis purposes.

This research work demonstrates a way of managing information throughout the product development process. Accordingly, it should be possible to retrieve existing information and store new information. A prerequisite for this is the centralization of the resulting information.

This centralization takes place via a Product Data Management (PDM) database that includes the original project data of the DLR missions Eu:CROPIS, ReFEx and MMX. The paper will present the key requirements of the database solution and its implementation.

One core feature of the solution is a web application that allows users to interact with the data. In cooperation with the service provider RADIUSMEDIA KG, the PDM database and its AR application are

replacing the manual documentation with a fully digital system. Employees are able to better coordinate AIV decisions and promote the exchange of valuable AIV knowledge. It reduces complexity, simplifies processes, reduces sources of error and saves time. The AR application will support the employees with the tablets and data glasses like a knowledgeable assistant. It also supplies cloud-based data for dashboards, reports and records.