Abstract

CATIA, Computer Aided Three-dimensional Interactive Application developed by Dassault Systèmes and marketed worldwide by IBM, CATIA V5 has been used by companies such as Airbus, The Boeing Company, Audi, Porsche, BMW and more. It is a commercial software used for Computer Aided Design (CAD), Computer Aided Engineering (CAE), and Computer Aided Manufacturing (CAM) in the aerospace and automotive sectors. The present study of the main CAD workbenches in CATIA V5 analyzes the main features for information visualization, information retrieval and Knowledge Organization. In addition, the study proposes a specification and application of the Dublin Core metadata scheme for the description of the main CAD objects in CATIA V5 that includes a simple way to defining and loading the scheme within the system and exporting the records without the help of any external applications or Application Programming Interface (API). Not many works studying such a specific topic of CATIA V5 have been published in the literature, and when it has been studied, it was usually done in talks about the ISO 10303-209 STEP AP standard and never about the application of Dublin Core. According to the published literature, the Dublin Core scheme has never been applied to such a specific area as CAD objects in CATIA V5. CATIA V5 is a powerful tool that can be easily customized via APIs using Visual Basic or C++ programming languages. Following these possibilities, several commercial applications have been developed in order to enhance Product Lifecycle Management (PLM) purposes in CATIA V5 (E.g. Enovia and Windchill PDMlink). The present work analyzes the structure of the main workbenches used for CAD in CATIA V5, focusing on the PART design and Assembly design workbenches, and information visualization devices like the 3D space and the specification tree. As for the information retrieval features, possibilities in the advanced search are analysed, focusing on the characteristics of searchable fields of both Part design and Assembly design objects (i.e. .Product and .Part files), the specification of types of these fields that will be necessary for the definition of the scheme, and the possibilities the default search tool in CATIA V5 allows for these objects. Furthermore, an application of the fifteen Dublin Core elements, according to the Dublin Core Version 1.1 definition (http://dublincore.org/documents/dces/) for the context of CAD objects in CATIA V5 is discussed. Finally, an easy way to define all the Dublin Core elements within the system in two different simple ways is explained, using both the Bill of Materials and Listing Report CATIA V5 features, allowing an exportation of these records in .html, .xls, and .txt formats. The relevance of this work is in using the Dublin Core metadata scheme for the description of objects generated in CATIA V5 enabling automatic or semiautomatic processing of the exported data, thus allowing integration of these objects into broader collections, the establishment of relations with other objects of similar nature, and the comparison of these with other general objects of different nature, but capable of being described by the same scheme. The objectives of this description would also include the possibility of integration of CAD objects in digital repositories, academic learning environments, simple applications for designers, and any other system based on ontologies and recommender systems capable of inferring relations between objects. For this a general standardized scheme for representation and export of objects, as well as a definition capable of being applied to the CAD context in CATIA V5 is needed, and thus the specification of the Dublin Core scheme for this purpose justified.