CORE DESCRIPTION STANDARDIZATION USING ONTOLOGIES AND MOBILE SOLUTIONS

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ABSTRACT:

Sequential descriptions or logs of outcrops and borehole cores provide key information for understanding the processes of generation and evolution of the rocks and their resources, such as accumulations of ores or petroleum. Currently, most sequential descriptions are still created using non-standardized data formats, in which geologists use free text and hand drawings on paper to describe the cores or outcrops. The acquisition, retrieval and processing of data in such format is time-consuming, imprecise and ineffective. Different geologists use different terms to describe the same features, and extensive redrawing is required to make the descriptions available to be used and integrated in the following workflow phases. The purpose of the Strataledge software suite is to assist geologists in the creation of descriptions in standard data format, maintaining the geological flexibility wished by geologists, and in their processing and integration to other data and information. An extensive research in the Sedimentary Stratigraphy, Igneous and Metamorphic Petrology literature and standardize associations was carried on, along with a large number of interviewing with distinct professional profiles of geologists, in order to define the vocabulary and organization of the terminology for visual description required in a core and outcrop software system. The vocabulary covers all types of lithologies, structures, textures and other features of the rocks and is formalized in a domain ontology that supports the software application and can be further used to index other legacy contents. The Strataledge software suite is composed by mobile and desktop systems. Strataledge Mobile, designed to run on tablet devices, is responsible for assisting the geologists in the task of creating sequential core or outcrop descriptions. Descriptions are created following a standard format, with a dynamical scale, and graphic reports can be generated and exported in different formats (PNG, HTML, SVG, XML, CSV, LAS) or stored in non-proprietary format in a relational database. Strataledge Desktop is responsible for helping the geologists in the integration of the descriptions produced in the mobile software with other data, such as wireline log data (gamma ray, resistivity, and density, for example), geochemical and petrographic analyses. Structural or stratigraphic sections can be easily constructed through the correlation of diverse sequential descriptions. The use of the Strataledge software suite allows significant time, work and error reduction through the creation of descriptions originally in digital format and through the easy generation of graphic reports in any chosen scale. Besides, the system allows relatively untrained geologists to better describe the rock features by visually matching the iconic representations and the visual features observed in the rock. Strataledge records can be stored in a centralized database of core descriptions allowing them to be compared or correlated using different integration and modeling software, what enhances the utility and value of sequential core or outcrop descriptions.

KEYWORDS: GEOLOGICAL DATA ANALYSIS, SEQUENTIAL DESCRIPTIONS AND VISUALIZATION, ONTOLOGY.