Session 3: Decision support systems and digitisation in agriculture

MLR-O: Semantic Web Support for Interoperable Food Safety Legislation. Carlos Enrique Pintor, Carlos Francisco Ragout, Diego Torres and Alejandro Fernández

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Agrochemical substances and its derivatives are used throughout agricultural processes to control the presence of different types of pests. The MRL (Maximum Residue Limit) is the maximum concentrations of residues (expressed as mg/kg) to be legally permitted in or on a food by national or regional legislation. Governments and Health Organizations throughout the globe determine and publish recommended values of MRL periodically, so that all interested parties (e.i. public health agencies, farmers, researchers, consumer organizations, traders, etc.) are able to adopt this information to conduct safe practices. These values have a significant impact in human health and in international food trade. Given the lack of official or standardized guidelines regarding how this data should be produced and published, organizations around the world use a wide range of methods and supporting media for publishing documents on MRL, involving different formats (e.g. pdf, xml, csv, etc.), content types (tables, graphics, lists, etc.) and language. There is no formal curation process on the data itself to prevent including inaccurate terms, syntax errors, omissions, synonyms and proprietary data structures. The diversity in publication formats makes it difficult to process and analyze the datasets by using computers due to incompatibility issues among documents from different sources, or even between versions of the same document. The Semantic Web offers an alternative to address this interoperability challenge.

In this work we apply semantic web technologies and tools to design and create MRL-O, a specific ontology to represent MRL-related data. In building MRL-O we reuse, as much as possible, existing ontologies and vocabularies. As a proof of concept, we present the results of feeding our pipeline with real datasets found in official documents from Argentina and Brazil to obtain MRL-O data, and we run SPARQL queries on the results to derive information of interest in different scenarios.