

The CEREALAB online Database of Molecular and Phenotypic Data for Marker-Assisted Selection of Cereals

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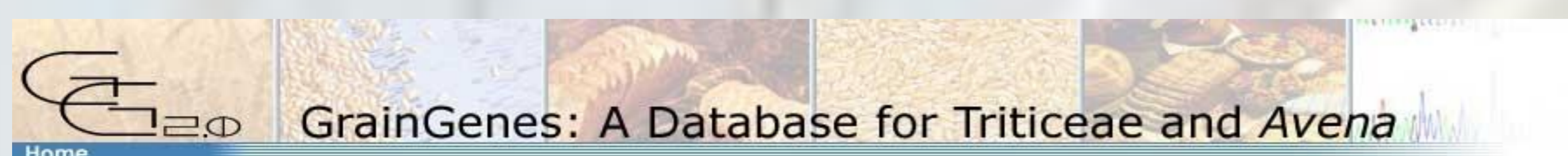
The CEREALAB database (<http://www.cerealab.org>), has been designed as an information system for help the choice of parents and of markers associated to relevant agronomic traits, for their application in the marker-assisted selection. It is a source of molecular and phenotypic data, realized for the molecular data through the integration of three data sources: two already existing web databases, Gramene and GrainGenes, together with the source storing the information achieved by research groups of the CEREALAB project. It is devoted to four species of major interest for the Italian agriculture: durum and bread wheat, barley and rice.

The characters to be included for the database searches were chosen in accordance with the expectations of seed companies and breeders with a particular attention to biotic and abiotic stress, yield, quality, growth and development related traits.

DATA SOURCES

PUBLIC ON-LINE DATABASES

Grain Genes has been used as a source of information regarding bread and durum wheat and barley. Molecular data for rice has been retrieved from Gramene Database (in accordance with the database curators).

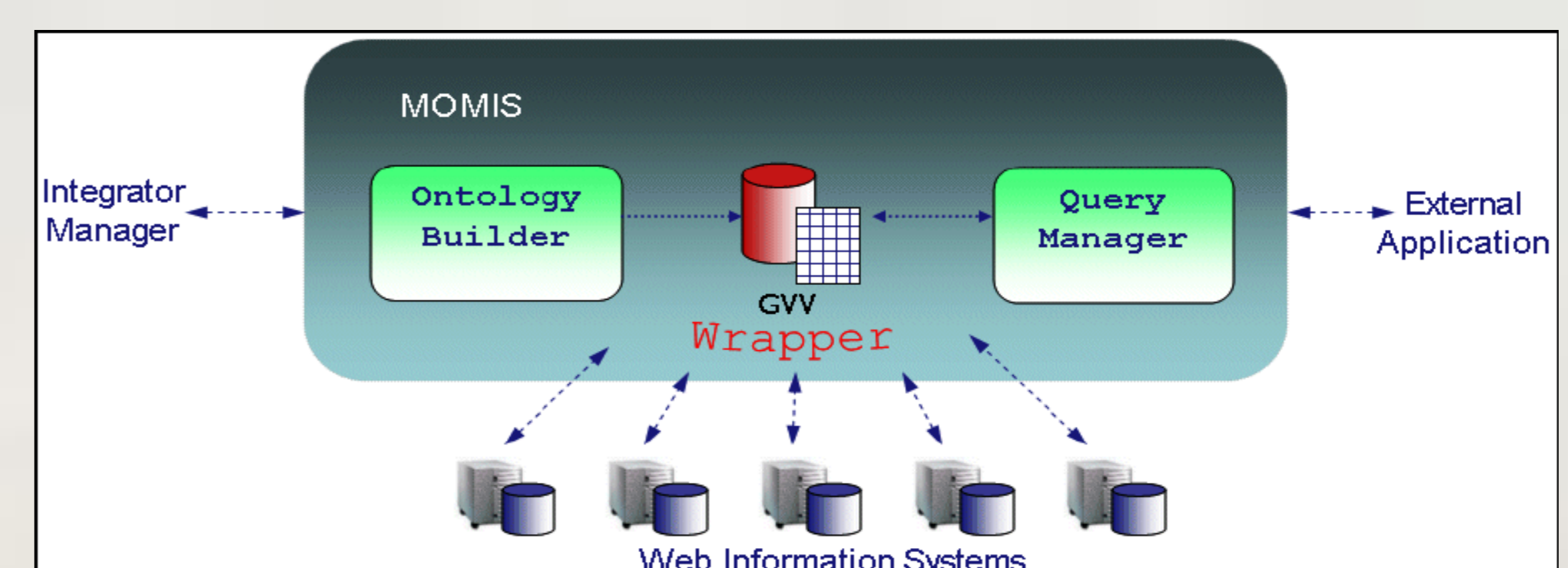
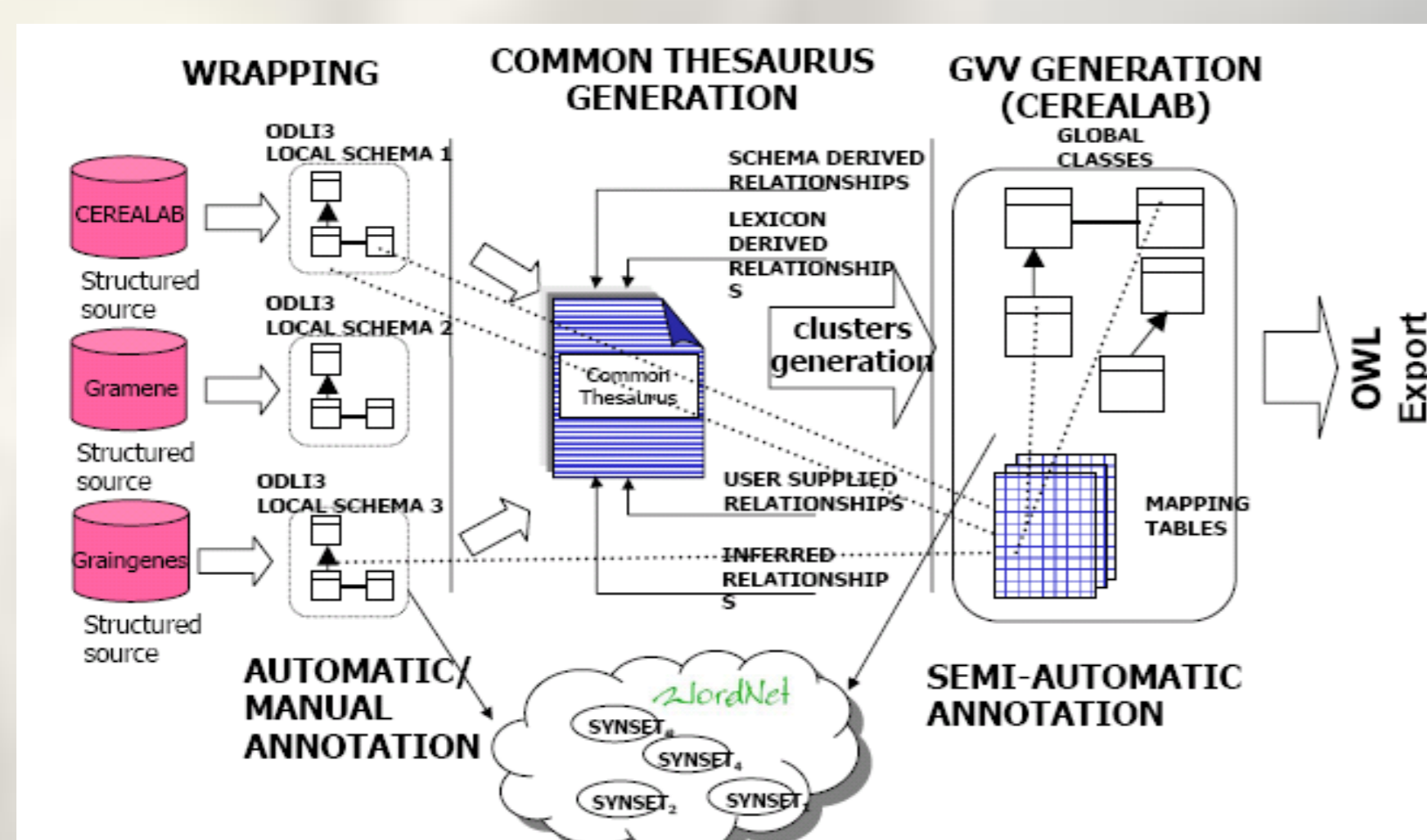


CEREALAB PROJECT SOURCE

The newly recorded marker data derive from a systematic genotyping work by using already known markers and some new protocols developed by the discovery workpackage of the CEREALAB project include, for instance, characterization of bread wheat, rice and barley with known markers associated with resistance to the most common pathogens or development of brand-new protocols for markers for cooking quality and pigment content in rice. CEREALAB source includes also phenotypic data that comes from two sources: the Italian National Network of varietal filed trials and ase (the Germplasm Resources Information Network of the United States Department of Agriculture, Agriculture Research Service) as far foreign varieties and lines are concerned

GLOBAL VIRTUAL VIEW (GVV)

As a first step conceptual model of the database containing molecular and phenotypic data and their relationships was developed in cooperation with the Database Group of the University of Modena and Reggio Emilia. Then a Global Virtual View (GVV) was created to perform intelligent data integration of existing databases. The GVV has been realized with the **MOMIS** system (Mediator environment for Multiple Information Sources) developed by the Database Group of the University of Modena and Reggio Emilia.



DATABASE INTERFACE

The result obtained is a queryable virtual view that integrates the three sources (Grain Genes, Gramene and CEREALAB source) and allows performing selection of cultivars of barley, wheat and rice based on molecular data and phenotypic traits, regardless of the specific languages of the three source databases. Interface has been created for end-users: breeders and geneticists. The phenotypic characters included in the database are divided into six categories: Abiotic Stress, Biotic Stress, Growth and Development, Quality and Yield. As far as molecular data is concerned the major categories for the query are: Trait, Qtl, Gene and Marker.

