



A Spatial Data Infrastructure for the Management of Veterinary Surveillance Programmes



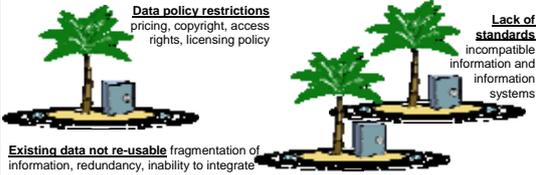
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Summary

Based on the experiences gained with a WebGIS used for the publication of epidemiological thematic maps and the collection of farm coordinates, a Spatial Data Infrastructure (SDI) has been designed to manage the data generated by veterinary surveillance programs in Italy's Veneto Region. In particular, the SDI could provide an environment in which all stakeholders (i.e., both the producers and users of spatial data) can cooperate and utilise technology in a cost-effective manner. The overall information management system design consists of multiple database repositories that store tabular data in both a transactional database and data marts, GIS data within a Spatial Database Engine (SDE), and documents on file servers.

Introduction

Almost every piece of information has a location associated with it. Location information can be managed by a Geographic Information System (GIS). Data are the most critical component of this system but... data are managed in autonomous and heterogeneous repositories that varies in format and representation.



The large amount and variety of data, the use of the data beyond the original intent of those creating it and the use of relatively low precision access techniques has led to the well recognised problem of: **information overload**



A Spatial Data Infrastructure (SDI) help in reducing Information Overload

SDI: a framework of data, technology, policies, standards and human resources, necessary to facilitate the sharing and using of spatial information: not just hardware and data (equivalent in the rail system to carriages, power lines, rail tracks, stations) but also the need for coordinating structure and international standards and agreements (on gauges, timetable, safety rules, signalling, etc.) without which the system cannot operate consistently and safely

One of the key element in the SDI is the data harmonisation and integration process

type of heterogeneity: *system* (hardware and operating system), *syntactic* (data representation, format and storage), *structural* (data modelling), *semantic* (meaning, languages and context in which they are interpreted).



To facilitate harmonisation and integration, transformation among inconsistent data are required

The integration process can be developed according to the ETL (Extract, Transform, Load) logic, where wrappers determine the appropriate set of information sources and generate the proper sub-set of data from each information source, and the interface part is responsible for translating the information acquired by the wrapper according to the format and data model required.

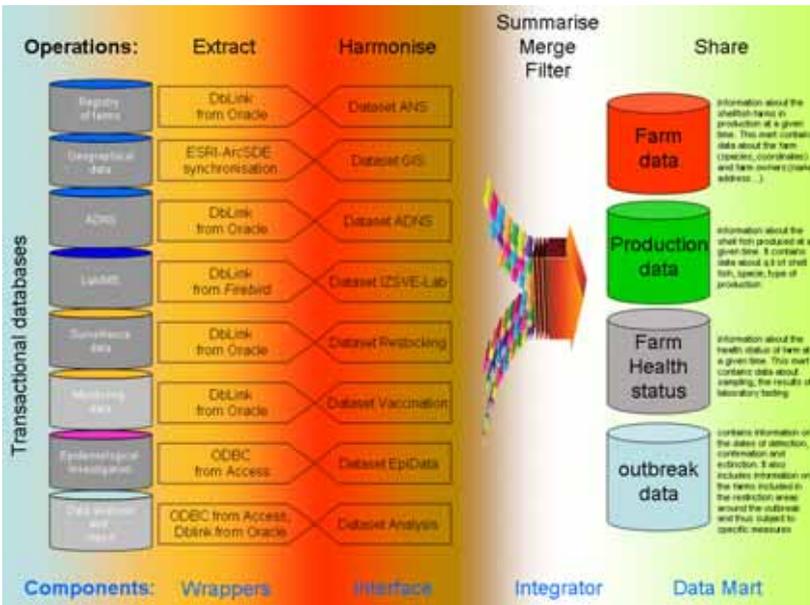
A Data Mart help in implementing a data mining solution

Data Mart: repository of data gathered from operational data and other sources that is designed to serve a particular community of knowledge workers.

While transactional databases are used for the collection, processing and quality assurance of data, they are not optimized for data retrieval. To overcome this deficiency Data Marts pull data from the transactional database and provide it in a format that makes querying, retrieving and reporting on data easy and efficient.

The GeoCREV

The Geospatial Data Infrastructure of the Veterinary Laboratory of Veneto Region (GeoCREV) is a 5-year initiative of the Zooprofylactic Experimental Institute of the Venices (IZSve) that started in May 2008. Its overall goal is to develop an SDI allowing an incorporation of Geographic Information (GI) into the veterinary laboratory and relate data. The GeoCREV business model can be defined as an infrastructure of the regional veterinary data, with one element being geographic data. This has been achieved by connecting the value chains of users (Local Health Units, Regional Department of Veterinary Public Health and Food Safety), data producers (Veterinary Laboratory, Regional Veterinary Information System, Regional Cartographic Department) and service provider (WebGIS and geo-database) within an infrastructure. The overall goal of the GeoCREV is to produce and harmonised fundamental veterinary dataset and facilitate the access to and application of those data through an increased use of GI, hence to provide a new means of acquiring knowledge. The policy arrangement of the system regards all aspect of data acquisition, storage and distribution with particular relevance toward the data harmonisation aspects. All datasets maintained by the system (geographic data, base data and application-specific data) are built by capturing and transforming data from the linked operational databases according to the data mart principle. The results are a set of geographic information products the user can access directly by web services or by means of a WebGIS user interface.



The data mart provides the specific data which, combined with the geo-database spatial data, constitute the thematic layers of the infrastructure. These layers are published through a Geodatabase and through a WebGIS portal equipped with standard ArcGIS™ tools and query functions.



WebGIS

Web Service

Maps