



## Coral – Mining Experimental Data

**Experimental projects are costly and can require tens of man-years of effort. The data produced often represents a substantial investment for the company involved and should be viewed as a hugely valuable company asset. However, knowledge of an experiment’s context and raw data files are often lost after a project closes or employees move on to other projects.**

Companies need to ask themselves:

- How can our data assets be kept safe and fully exploited?
- Should our data become important years in the future, could they be retrieved?
- And would we be confident that we know how they were generated?

These were questions asked by Unilever as they embarked on assessing ‘Omics technologies and their application to risk assessment in consumer products.

Unilever approached Tessella (leaders in data management and archiving solutions) to develop a data management system that would keep both data and context safe, and make them readily available for integration with data from other technologies and analysis using standard off-the-shelf programs.

### **New technology: opportunity and risk**

Technology is always advancing. Usually new technology offers opportunities to derive new knowledge, faster, at greater sensitivity and at higher throughput. The value of new technology is even greater when it is integrated with existing knowledge.

However, for the data manager new technologies can come with big drawbacks.

New technologies often also mean new or changed data files and formats. Greater throughput leads to higher data volumes for a single experiment.

How can valuable data from minority and up-and-coming technologies be kept safe for future exploitation? These data are all the more valuable if they can be integrated with other technologies at an early stage but without the need to develop a dedicated system.



For Unilever, developing a dedicated system for each experimental technology they wanted to use, would have led to:

- Maintenance of five different databases
- Maintenance of associated software
- Several under-utilized databases
- Difficulty integrating technologies together and with other data sources

### Adaptable data management

Tessella worked closely with Unilever to develop Coral, a flexible experiment data management system capable of safely storing data from current and future technologies. For each technology Coral can automatically generate a 'Data Mart', providing web-based query access for experimentalists and analysts.

Coral achieves this flexibility by incorporating:

- An experimental framework applicable to a wide range of technologies
- A straight-forward graphical interface for defining new technologies to Coral
- Custom-defined attributes for each technology
- A modular data loading approach
- Storage of experiment data, experiment files and experiment meta-data

This adaptability means that minimal changes are required for new data formats and equipment. Meanwhile, a single flexible system cuts down effort and training necessary for maintenance.

The flexibility inherent in Coral proved its value when another technology, immunohistochemistry, was added to the project at a late stage. Valuable data, that would otherwise not be stored, could easily be accommodated within the Coral system.

### Integrating technologies

The Coral data marts give users a single point of access for data from all the experimental technologies. The web-based query interface is a BioMart, developed by the European Bioinformatics Institute ([www.biomart.org](http://www.biomart.org)). It provides a simple 3-step solution to formulating complex queries. Experimental data and data files can then be retrieved for input into standard analysis packages.

Coral data marts are not only able to link queries between technologies but can also link to query data sources over the Internet, such as those generated for the Human Genome Project.

### Working with academia and Open Source

Tessella recruits staff with exceptional domain knowledge and from a wide range of research fields. Our ability to provide staff with existing experience of the technologies involved was an important consideration for the customer. This created a knowledgeable interface between the customer and all the academic groups contributing to the success of the project.

During the project Tessella worked closely with 'open source' developers in the academic community. By tailoring their academic software it became easy for Unilever to use, and useful in a commercial environment.

### Continuing value

The Coral system provides Unilever with a safe repository for experimental data from a range of different technologies. Through data marts, the data are easily available for current and future analysis throughout the organization. The customer is able to integrate their results with other data, either other technologies or genomic data.

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