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ANSA Phase III

Meta-Information Management Overview

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Abstract

The provision of truly global integrated information services is an exciting and timely opportunity. The World Wide Web provides a loosely organised framework for this integration, but does not yet contain support for information management on the large scale, or for obtaining information in a fashion that is based completely on the requirements of the information consumer.

The technical problem that arises from the desire to integrate information services using the World Wide Web as the storage and retrieval medium is how to provide system-based support for information management methods that have high leverage, are stable, distributable, have shallow scaling properties, and generalise well to new forms and combinations of information.

The best solution to these problems is to use meta-information as the management substrate for the construction of appropriate systems. This presentation reviews a selection of successful approaches to the kinds of problems encountered in the construction and management of meta-information, and describes how similar ideas are being applied to extend the functionality available on the World Wide Web in the development of a prototype Web-based meta-information management system.

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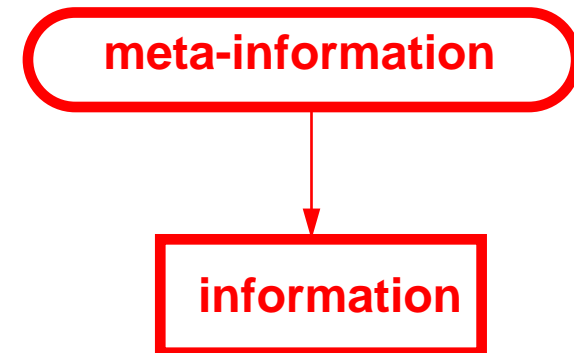
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Meta-Information Overview

- **Meta-Information Characteristics**
 - high leverage approach to dealing with information
 - generally applicable methodology
 - temporally stable & spatially scalable
 - generalisable to unforeseen applications

Meta-Information
describes
information



Meta-information is a general approach to building large scale information systems



Meta-Information Review

- **Meta-Information has been used in**
 - **bespoke subject-centred applications**
 - **automatically generated knowledge management engines**
 - **heterogeneous distributed environs**
 - **open distributed learning systems**

Meta-Information
is a management tool for
information

- **Meta-Information Sample Projects:**
 - **GENPRO**
 - **GIRD**
 - **LUMP**
 - **STILE**

Meta-information has been successfully applied to the development of management-engine type systems

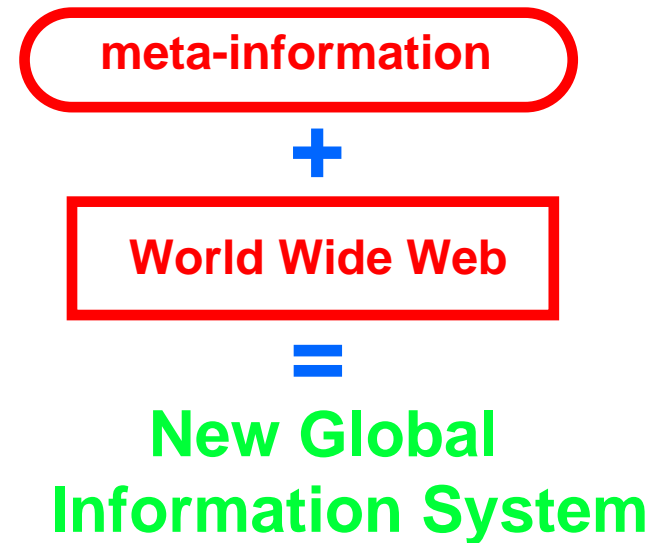


Metainformation Projects Summarised

- **GENPRO: bespoke subject-centred application for generating correct protein structure database queries as Prolog clauses [Eccles 90]**
- **GIRD: automatically generated engine for enterprise information management [Hsu 91]**
- **LUMP: general meta-information representation design and architecture for heterogeneous distributed environments [Madsen 94]**
- **STILE: open distributed learning system using LUMP representation mapped into HTML documents [Madsen 95]**

Meta-Information on the World Wide Web

- **Meta-Information can be used to extend Web functionality by:**
 - improving distribution transparency
 - automatically generated systems
 - globally accessible systems
 - heterogeneous distributed environs



Meta-information management will be implemented in a planned prototype Web-based system

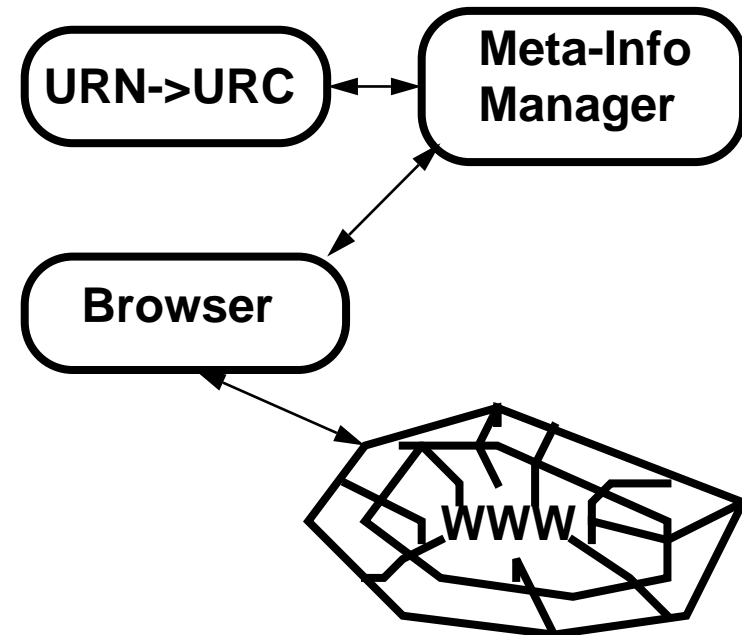


Extending the functionality of the World Wide Web

- **Improving distribution transparency: access resources by name and/or qualities rather than by location**
- **Automatic system generation: make collections of meta-information of a particular nature automatically and cooperatively using trading technology**
- **Sharing of meta-information across systems: make systems negotiate on formats and content of delivered resources**
- **Integration of heterogeneous distributed information environments: comes about as a result of all the above points**

Web-Based Meta-Information Prototype

- The prototype Web-based system will be implemented using:
 - scripting technology for extensibility and prototyping rapidity
 - URC constructs for meta-information representation
 - CORBA trader technology for URN resolution



The idea of the prototype is that meta-information will be used to add value to the Web



References

[Eccles 90] J.R. Eccles & J.W Saldanha, *Computer Methods and Programs in Biomedicine* 32:115-123, 1990.

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[Madsen 94] M. Madsen, I. Fogg & C. Ruggles, *Libri* 44:237-257, 1994.

[Madsen 95] M. Madsen *et al*, *Software Practice and Experience*, under submission.