

Opening Address ER 2007

Auckland, New Zealand

Nov. 5, 2007

Bernhard Thalheim
Kiel, Germany





Conceptual Modelling?

Design a database structuring, functionality, distribution and interactivity

- to meet all the information (contextual) requirements of the entire spectrum of users in a given application area;
- to provide a “natural” and easy-to-understand structuring of the information content;
- to preserve the designers’ entire semantic information for a later redesign;
- to meet all the processing requirements and also achieve a high degree of efficiency in processing;
- to achieve logical independence of query and transaction formulation on this level;
- to provide a simple and easy-to-comprehend user interface family.

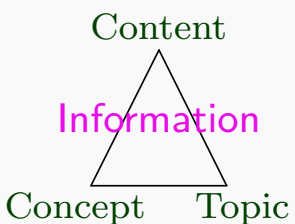
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Open problems: Structuring (1)

Open problem 1.

Define in a formal form: quality criteria, quality attributes, and quality metrics for conceptual modelling and develop a framework for their enforcement, control, and refinement.

Open problem 2.

Provide a reasoning facility for treatment of sets of constraints. Classify 'real life' constraint sets which can be easily maintained and specified.

Open problem 3.

Find techniques and theories that support treatment of redundant sets of objects and that support consistency management for sets of objects, e.g., XML document sets.

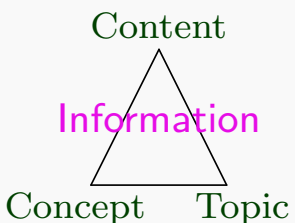
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Open problems: Structuring (2)

Open problem 4.

Find a common framework for the utilization of vertical, horizontal and deductive normalization for object-relational database models.

Open problem 5.

Find a normalization theory which is robust for incomplete constraint sets.

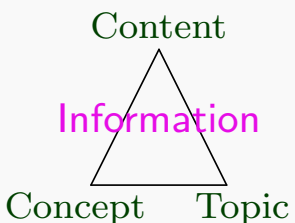
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Open problems: Structuring (3)

Open problem 6.

Is the implication problem for closure dependencies and functional dependencies (fd's) decidable? Axiomatizable?

Which subclass of inclusion constraints properly containing the unary inclusion dependencies is axiomatizable together with the class of fd's?

Which subclass of join dependencies properly containing the class of multivalued dependencies is axiomatizable?

Characterize relations which are compatible under fd's.

Characterize the properties of constraint classes under horizontal decomposition.

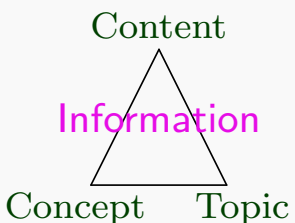
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Open problems: Functionality

Open problem 7.

Develop a general theory of extended operations for object-relational models.

Open problem 8.

Develop a theory of interference of database constraints that can be mapped to well-behaving sets of database triggers and stored procedures.

Open problem 9.

Develop a theory of database behavior. This theory explains the run of database management systems as well as the run of database systems.

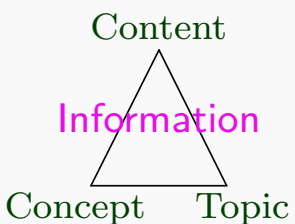
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Open problems: Functionality

Open problem 10.

Develop a general theory of abstraction and refinement for database systems that supports architectures and separation or parqueting of database systems into components.

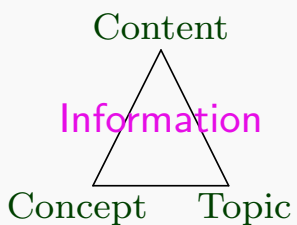
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Open problems: General

Open problem 11.

Find a common motivation, a common formal model and a correspondence that justify the properties and formalise the characteristics.

Open problem 12.

Find an architecture for generic extension of database systems that entirely supports the extensions, that allows to model all facilities and that supports reasoning on system properties.

Open problem 13.

Define in a formal form quality criteria, quality attributes, and quality metrics for conceptual modelling and develop a framework for their enforcement, control, and refinement.

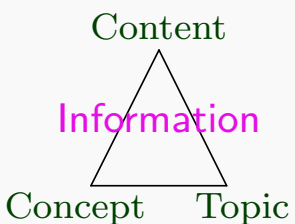
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Open problems: Distribution

Open problem 14.

Specification and mappings of distribution: Develop a theory for specification of distribution, for mapping of distribution to structuring and functionality of information systems.

Open problem 15.

Distribution semantics: Define a theory for semantics of distributio and define integrated mapping of services, exchange frames and semantics to media types.

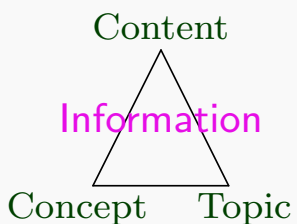
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Open problems: Interactivity

Open problem 16.

Flexible playout/playin of content: Provide a theory that support adaptable (to the user, to the context, to the history, to the environment) delivery of content and reception of content.

Open problem 17.

Storyboard semantics: Develop a theory for semantics of storyboards and define integrated mapping of storyboards and semantics to media types.

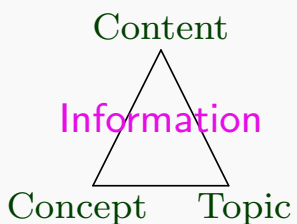
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Thanks

Finally

program committee
organisation committee
the other committees,
e.g. workshops, tutorial,
panel,...

for a great program
for the nice organisation

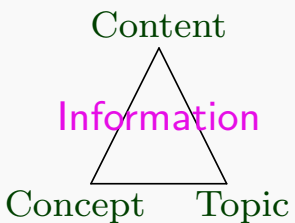
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Hopes and wishes

I wish you

to have a very successful
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with many new ideas
with many discussions
with long-lasting and fruitful contacts

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