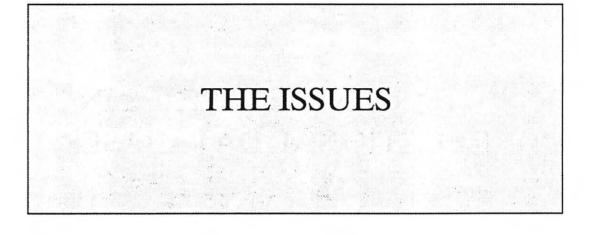
# TEXT AND GRAPHICS IN RELATIONAL DATABASES

DBEXPO '90 David McGoveran March 29, 1990



#### A REVOLUTION?

"The database community is in the midst of a conceptual revolution that will eventually supplant the relational paradigm."

"Virtually all proposals from the database community for the management of non-textual information use object-oriented techniques."

> - William Grosky and Rajiv Mehrotra, IEEE Computer, December 1989

### PHYSICAL ISSUES

- STORAGE
  - OPERATING SYSTEM FILES?
  - BLOBs?
  - STRUCTURED?
- EFFICIENT ACCESS METHODS AND INDEXING (DEFINITION: ACCESS METHODS ARE A SET OF PROCEDURE CALLS THAT RETRIEVE AND UPDATE RECORDS.)
  - B-TREE
  - R-TREE
  - EXTENDIBLE HASHING

#### TRANSACTION MANAGEMENT AND RECOVERY

- WHAT KIND OF INTERFACE?
- VERSION CONTROL
- LENGTH OF TRANSACTION
- EXTERNALLY VS. INTERNALLY STORED DATA **TYPES**
- CRASH RECOVERY

### **CONCURRENCY**

- LOCK MANAGEMENT
- LOCK GRANULARITY
- INTEGRATION
- SPECIAL DATA SHARING CONCERNS

#### **SECURITY**

- FIELD CONTENT LEVEL?
- **VIEWS**

### **OUERY OPTIMIZATION AND PROCESSING I**

THE GOAL: EFFICIENT QUERY PROCESSING BY CONTENT - THE RETRIEVAL OF NON-STANDARD DATA TYPES VIA OTHER NON-STANDARD DATA TYPES.

- PROCESSING
  - TEXT
  - IMAGE

#### **OUERY OPTIMIZATION AND PROCESSING II**

- STANDARD AND NON-STANDARD OPERATORS
  - RELATIONAL
  - **AGGREGATE**
  - OPERATOR PRECEDENCE
- OPTIMIZATION
  - **SELECTIVITY**
  - JOIN ALGORITHM
- **COLLATING SEQUENCES**

### **INTEGRITY ISSUES**

- ATOMIC VALUES
- DOMAIN INTEGRITY
- ENTITY INTEGRITY
- REFERENTIAL INTEGRITY
- NORMALIZATION

#### **USEFUL REFERENCES**

S. K. Chang, Q. Y. Shi, C. W. Yan, "Iconic Indexing by 2D Strings", IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 9, Number 3, May, 1987, pp. 413-428.

R. Fagin, et.al., "Extendible Hashing: A Fast Access Method for Dynamic Files", ACM-TODs, Sept. 1979.

W. Grosky, R. Mehrotra, "Guest Editors' Introduction: Image Database Management", IEEE Computer, December 1989, Vol.22, Number 12, pp.7-8.

A. Guttman, "A Dynamic Index Structure for Spatial Searching", ACM-SIGMOD Conf. on Management of Data, Boston, MA, June, 1984.

W. Litwin, "Linear Hashing: A New Tool for File and Table Addressing", Proc. 1980 VLDB Conference, Montreal, Canada, October, 1980

T. Sellis, N. Roussopoulos, and C. Saloutsos, "R+-Tree - A Dynamic Index for Multidimensional Objects", Proc. 13th International Conf. VLDB, Morgan Kaufmann, Palo Alto, CA, September 1987, pp.507-518.

M. Stonebraker, "Inclusion of New Types in Relational Data Base Systems", in Reading in Database Systems, M. Stonebraker, Editor, Morgan Kaufmann, Palo Alto, CA, 1988, pp.480-487.