

A.I.S. Class 13: Outline

- Group Work
- REA Modeling - a formal approach
- Mid-Term Examination
- Designing the Data Repository Structure for RDBMS
- Implementing the Design

Group Work

- Working in Groups, please prepare three slides to illustrate lessons learned from the paper: *Three “Events” That Define an REA Methodology for Systems Analysis, Design and Implementation*, focusing on NEW ideas and techniques

REA Modeling - a Formal Approach

Terminology for Events:

Textbook

Economic

Non-economic

Information

Denna

Core

Support

Information

David

Economic

Business

Information

REA Modeling - a Formal Approach

- Economic events increase or decrease economic resources
- Resources are scarce, have utility and are under the control of an enterprise
- Agents are those who participate in events

REA Modeling - a Formal Approach

- Economic exchanges are pairs of related events
- Duality relationship
 - * In an economic exchange, one resource is incremented while another is decremented
 - * The dual events need not be simultaneous nor need one be a precursor to the other

REA Modeling - a Formal Approach

■ Synergy relationships

- * Multiple events that occur in conjunction with each other and result in the whole being greater than the sum of the parts

REA Modeling - a Formal Approach

- Identify each economic exchange
- Model each exchange using REA
- Perform view integration to consolidate exchange diagrams
- Verify that there are events to increment and decrement each resource
- Verify that every event participates in a duality relationship
- Integrate supporting business events

REA Modeling - a Formal Approach

- A more radical view of events is taken here:
 - * only needed events should be added
 - * they should be modeled in accordance with business realities rather than traditional accounting conventions
 - * this view facilitates business process reengineering

REA Modeling - a Formal Approach

- Information processes are not recorded
- Database implementations tend to filter at the reporting stage whereas traditional accounting information systems have tended to filter at the recording stage

REA Modeling - a Formal Approach

■ Key characteristics of REA Systems

- * Support all critical events
- * Store a detailed history of events
- * Store data in an integrated repository
- * Are able to retrieve and manipulate data to meet user needs
- * Process events as they occur
- * Use directed REA design and implementation
- * Prepare financial statements without journal entries and a general ledger

Mid-Term Examination

■ Main features

- * 250 points
- * Five main sections
 - ◆ 35 or so multiple choice questions (similar to quizzes) worth 3 points each
 - ◆ Some definitions & abbreviations (2 points)
 - ◆ Short questions and problems including some flowcharting questions
 - ◆ A REA(L) modeling problem (40 - 50 points)
 - ◆ A short essay (30 points)
- * 80 minutes

Designing the Data Repository Structure for RDBMS

- There are three main issues involved in this step:
 - * Identifying the required tables
 - * Linking the tables
 - * Specifying the attributes for the tables

Identifying Required Tables

- Every entity in the REAL model will require a table with a primary key (subject to a possible decision to merge certain tables together during linking, or omit tables with only one row)
- In other words, there should normally be a table for every:
 - * resource
 - * event
 - * agent
 - * location

Identifying Required Tables

- Additional tables may be required to model certain types of links between entities (see next slide)
- Finally, tables may be required for reference purposes by the information system (e.g., tables of valid State Codes, Discount Codes, etc.)

Linking Tables - Choices

- Create separate Link table
 - * will always work
 - * may often be unnecessary
 - * sometimes the only choice (e.g., M:M)
- Post foreign keys
- Combine tables
- All three choices would work for 1:1

Linking Tables

■ 1:1 Links

- * collapse the two entities into a single table
or
- * post the primary key of either table as a foreign key in the other

■ 1:M and M:1 Links

- * post the primary key for the '1' table as a foreign key in the 'M' table

■ M:M Links

- * create a new Link Table with the primary keys from the original tables forming a composite key; add any uniquely defined attributes

Linking Tables

■ Except:

* For optional entities

- ◆ always treat as if their cardinality were M
- ◆ i.e., treat both (0,1) and (0,*) entities as (0,*)

* When modeling two events linked 1:1

- ◆ post the key of the first event as a foreign key in the table for the second

* When modeling two events linked 1:M where the '1' event follows the 'M' event

- ◆ treat the link as a M:M link - i.e., create an additional Link Table

Specifying Attributes

- Primary keys are identified when tables are formed
- Foreign keys are added in accordance with the rules for linking
- Other non-key attributes should be added based on the requirements identified at Step 6 of REAL modeling

Specifying Attributes

- Proposal Table
(Proposal#, [Scientist#] , Date_Submitted, etc.)
- Proposal-Scientist Link Table
([Proposal#], [Scientist#])
- Proposal-Equipment Link Table
([Proposal#], [Equipment#])
- Proposal-Chemicals Link Table
([Proposal#], [Chemical#], Quantity, Procedure)

Implementing the Design

- Create the Access tables required by the design
- Designate the primary keys
- Establish relationships between tables
- Create forms to maintain the tables for each resource and agent
- Create (multi-table) forms for event recording processes
- Create queries to generate desired information
- Develop report formats for the desired reports
- Build a custom menu system