

Enterprise Application Integration (EAI)

Chapter 2 Data-Level EAI

Data-Level EAI

- You can use all the quantitative data you can get, but you still have to distrust it and use your own intelligence and judgment.

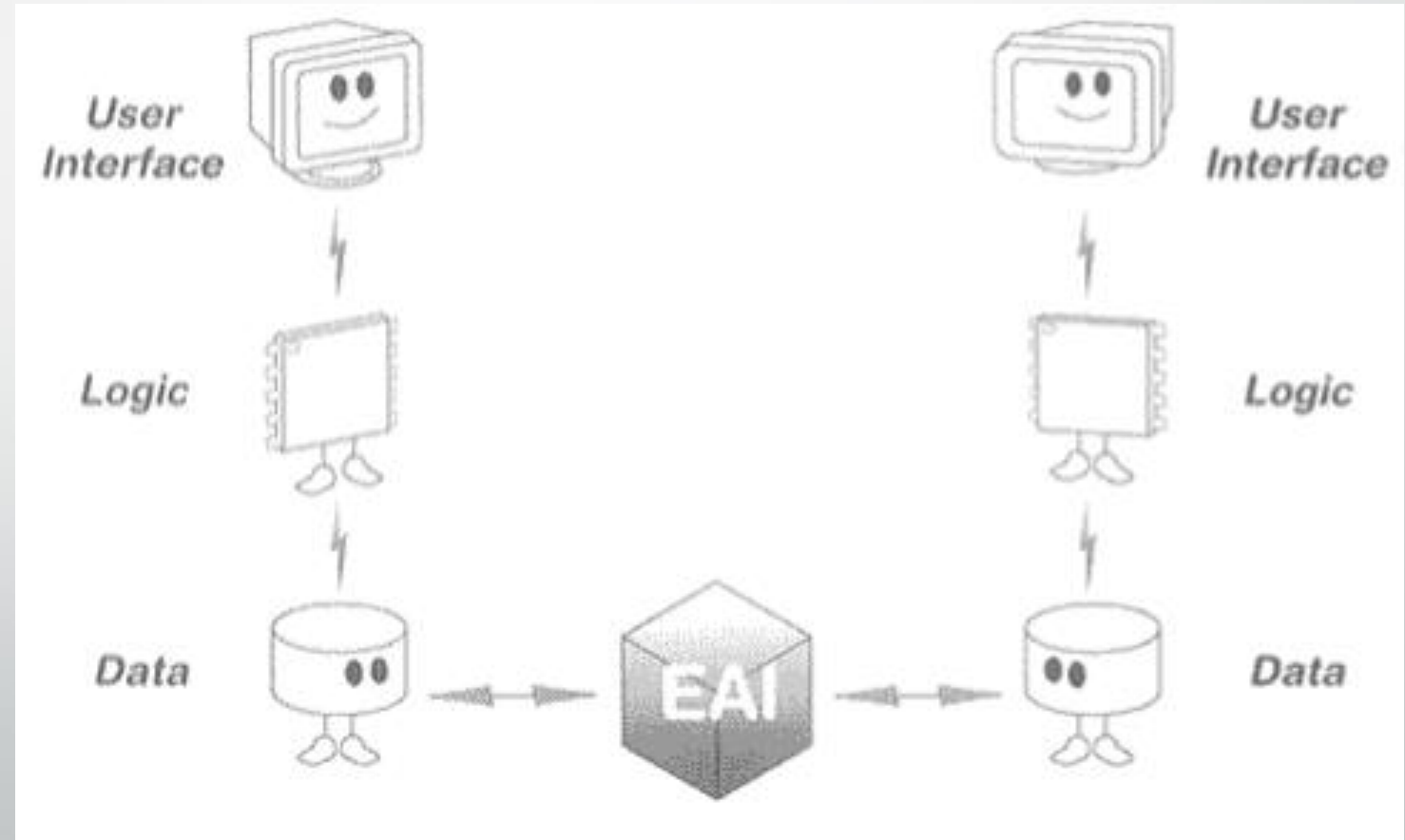
Alvin Toffler

Definition

- **Allow moving data between data stores in order to share relevant business information among applications**
- Easy?!!
 - Entry point
 - Number of tools and techniques
 - Adapting the information on the fly so it's represented correctly by the source and target applications
- Hard...
 - various database technologies and models that provide data storage for applications

Going for the Data

- Within the context of EAI we sneak behind the application and extract or update data directly





Database-to-database EAI

- Sharing information at the database level
- One-to-one, one-to-many, or many-to-many configurations
- With traditional database middleware and database replication software

Database-to-database EAI

- Two types of solutions here:
 - First, the basic **replication** solution moves information between databases that maintain the same basic schema information on all source and target databases.
 - The second solution is **replication and transformation**
Transform?!!
By transforming the data on the fly so it's represented correctly to the target database

Federated database EAI

- Access any number of databases, using various brands, models, and schemas, through a single **"virtual" database model**
- This virtual database model exists only in software and is mapped to any number of connected physical databases.
- Use as a single point of application integration, accessing data from any number of systems through the same single database interface

Federated database EAI

- **Advantage:** Reliance on middleware to share information between applications, and not a custom solution. The middleware hides the differences in the integrated databases from the other applications that are using the integrated view of the databases
- **Unfortunately, this is really not a true integration approach!**
 - There will still be the need to create the logic for integrating the applications with the databases

Consider the Data Source

- In order to implement data-level EAI, you first must consider the sources of the data and the database technology that houses the data
- **The good news...**
 - is that the majority of databases in existence today use the homogeneous relational database model, making it relatively simple to "mix and match"
- **The bad news...**
 - is that there are still many exceptions that form the "minority" heterogeneous models

Consider the Data Source

- When dealing with databases it is important to understand the following:
 - The model that the database uses to store information
 - The nature of the database itself, and how the differences between the databases existing within enterprises also provide an opportunity for integration

Relational Data

- Relational databases are the reigning monarchs of the database world
- Relational databases organize data in dimensional tables—and nothing but tables—that are tied together using common attributes (known as keys). Each table has rows and columns

Object-Oriented

- Information is represented in the form of objects

Object-Oriented Model

Object 1: Maintenance Report

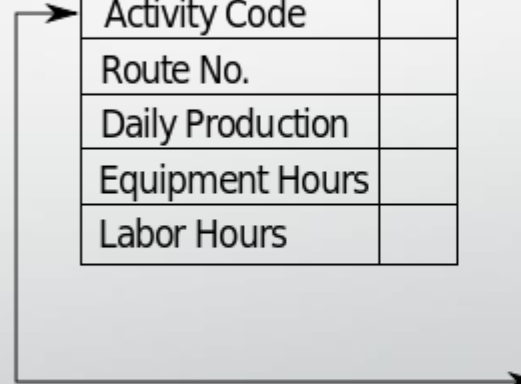
Object 1 Instance

Date	
Activity Code	
Route No.	
Daily Production	
Equipment Hours	
Labor Hours	

01-12-01
24
I-95
2.5
6.0
6.0

Object 2: Maintenance Activity

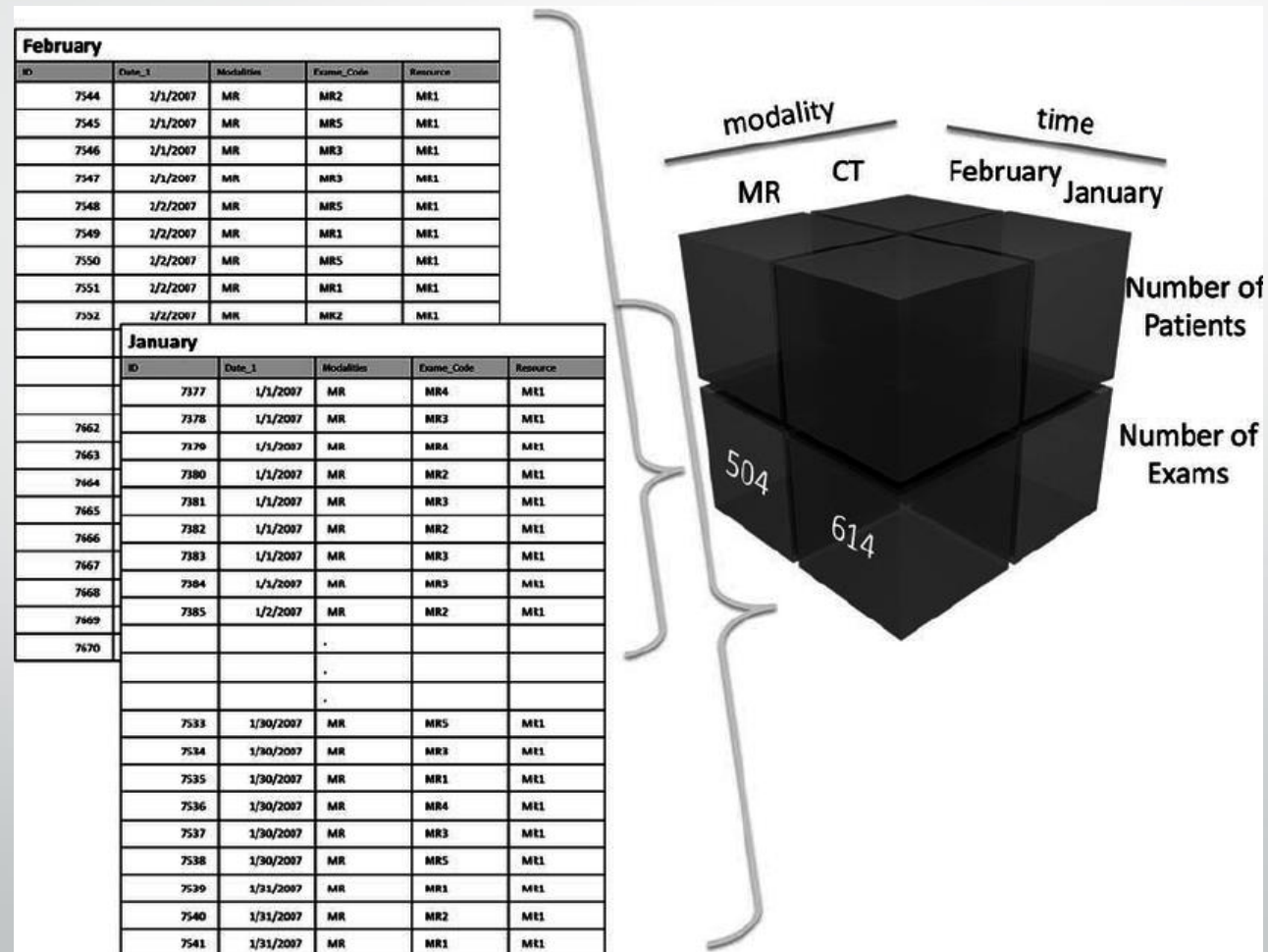
Activity Code	
Activity Name	
Production Unit	
Average Daily Production Rate	



Multidimensional database

- Multidimensional databases have evolved over the years and have been repackaged as databases that support online analytical processing (OLAP) or data mining—all wrapped up in a concept known as **data warehousing**

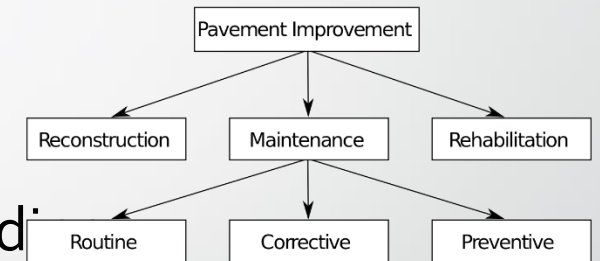
Multidimensional database



Other Data Storage Models

- **Hierarchical:** Data is organized into a tree-like structure
- **ISAM and VSAM:** ISAM is a simple file organization providing sequential and direct access to records existing in a large file. ISAM is hardware dependent. VSAM is an updated version of ISAM and is also hardware dependent
- **CODASYL** is a standard created by an organization of database vendors to specify a method for data access for COBOL
- **Adabas** or the Adaptable Database, is able to support a variety of database models within a single database

Hierarchical Model



Working with Data-Level EAI

- The difficulty with data-level EAI is the large scope of integrating various databases within the enterprise
- Enterprises should consider taking "baby steps" toward the goal of data-level EAI—and EAI in general. It would be wise to integrate two or three databases at first, allowing them to become successful, before moving forward to bigger problem domains