

# TOPICS

**Fundamentals**

**Structured and Object-Oriented Analysis**

**Formal and Automated Techniques**

# Data Modeling

## Data Objects, Attributes and Relationships

OOA concepts arose out of data-intensive analysis techniques (called *data modeling* or *information modeling*) that have been in existence for years (especially in database systems).

Recent uses of data modeling are seen in defining data formats for interchanging data between CAD systems, computers, and manufacturing organizations.

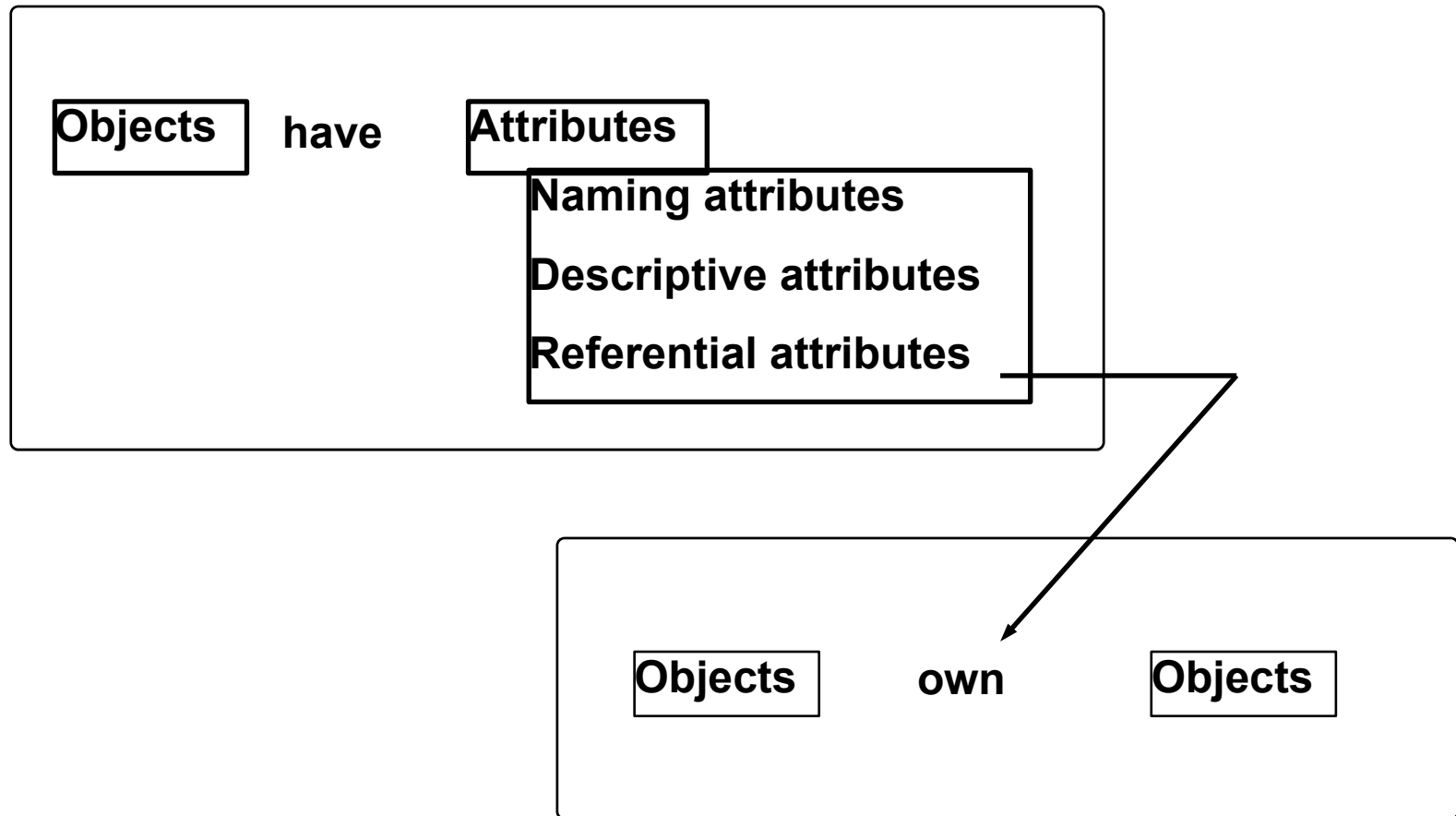
Some terms:

schema - data model used in databases

protocol - data model used in digital communications

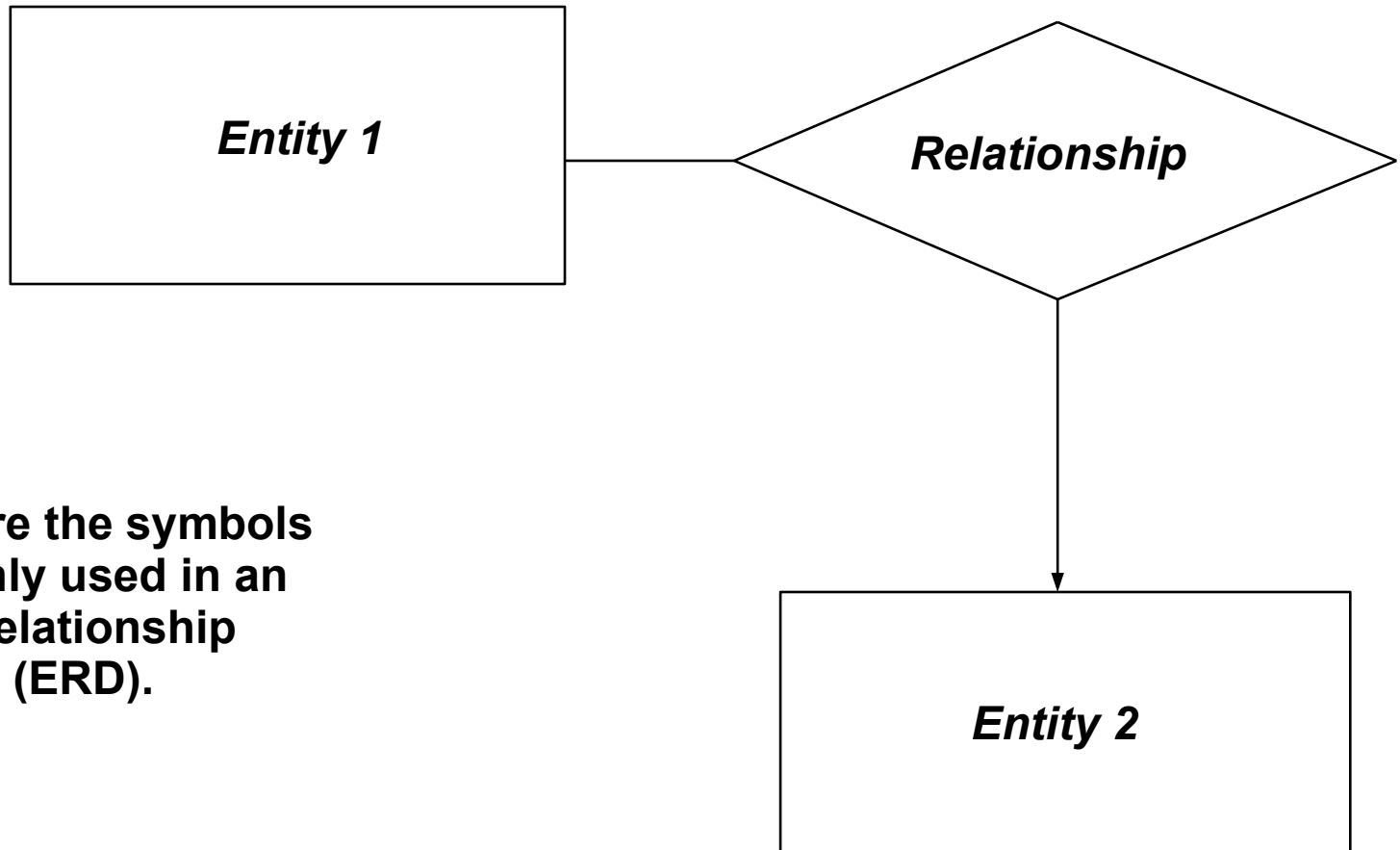
framework - data models used to interchange data between  
CAD systems and manufacturing organizations

# Data Objects, Attributes, and Relationships



# **Data Modeling**

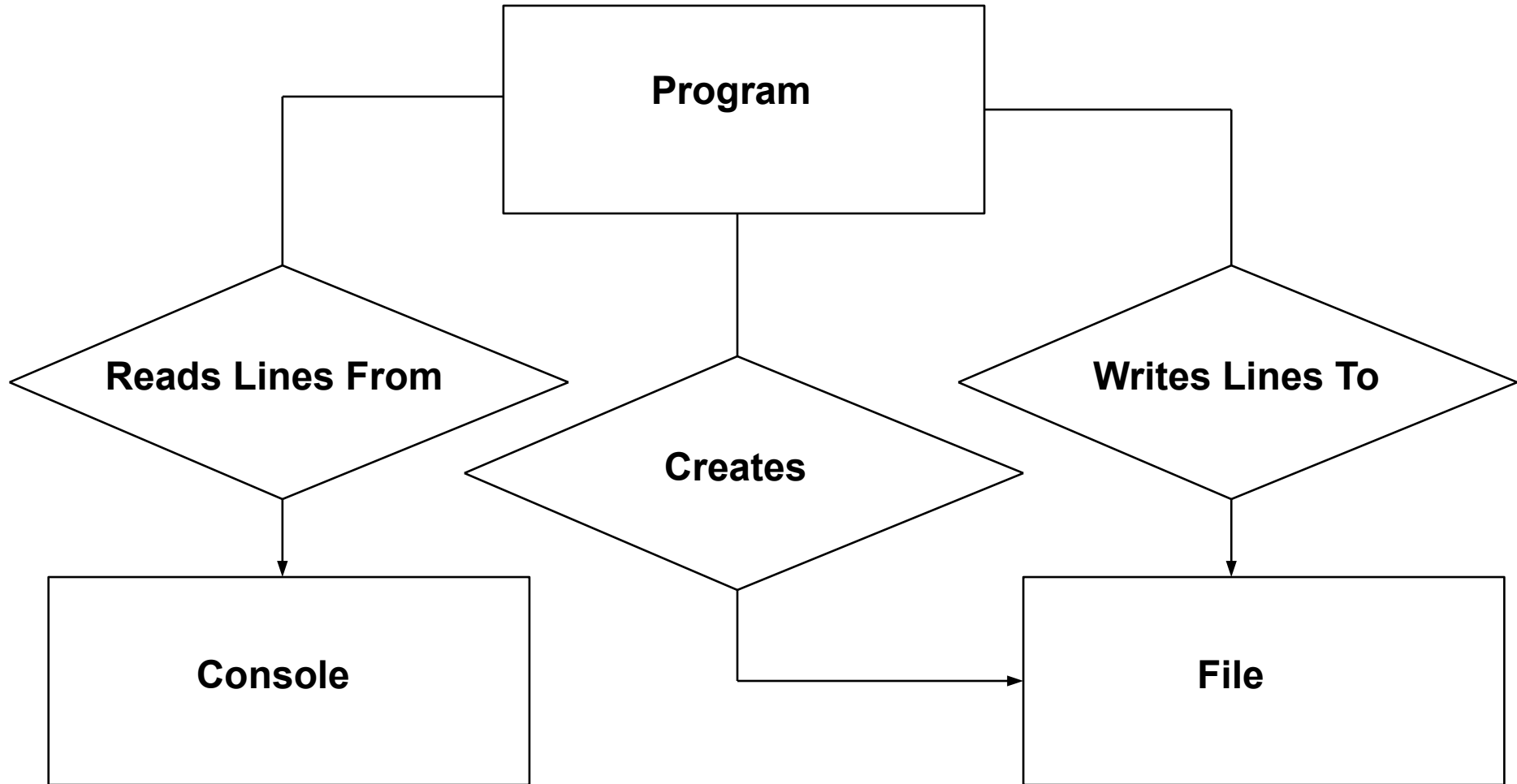
## **Entity-Relationship Diagrams**



**These are the symbols commonly used in an Entity-Relationship Diagram (ERD).**

# Data Modeling, Continued

## Entity-Relationship Diagrams - Example



# Automated Tools

- are often graphically-oriented**
- may provide consistency checking**
- support the development of the data dictionary**
- usually support the development of DoD-STD-2167A documentation**