

Alternatives for Incorporating Business Rules

(Chapter 9)

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What Is a Business Rule?

A business rule is a statement that defines or constrains some aspect of the business.

It is intended to assert business structure or to control or influence the behavior of a business.

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Business Rule Categories

- **Term:** A word or phrase that has a single definition
- **Fact:** A statement that relates terms to each other, describes a thing or a role it plays, or provides some other description
- **Derivation:** An attribute that is derived from other attributes
- **Constraint (AKA Assertion):** A condition that prescribes the values a relationship or attribute must have

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The Origin of Business Rules

- Business users and SMEs
- Process models
- Documents
- Business policies
- Laws and regulations
- Audit recommendations
- Established best practices
- Certification rules and guidelines

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Implementing Terms in Data Models

- Terms appear in data models as:
 - Entity names
 - Attribute names
 - Common business or industry terms used in descriptions of entities, attributes, and process logic

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Implementing Facts in Data Models

- Facts (not to be confused with Fact tables) appear in data models as:
 - Relationships and roles (but cannot enforce mandatory on the "many" side)
 - Attributes
 - Supertypes and Subtypes (particularly useful in conceptual and logical models)

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Implementing Derivations in Data Models

- Derivations cannot be directly implemented
- The results of derivations can be represented as attributes, but there is no standard way to show which attributes are derived

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Implementing Constraints in Data Models

- Constraints appear in data models as:
 - Optionality (NULL versus NOT NULL)
 - Cardinality
 - Unique identifiers
 - Subtypes (Exclusive versus not)
 - Domains

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Limitations on Implementing Constraints

- Optionality cannot show an attribute or relationship that is only optional under certain circumstances
- Cardinality cannot show variable maximums depending on circumstances
- Domain support varies across modeling tools. Some DBMS products support user-defined types.
- Tradeoff between generalizing models and implementing specific constraints

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Functional Classification of Business Rules

- An alternative (and common) way to classify business rules is by function:
 - Definitional rules
 - Data validation rules
 - Data derivation rules
 - Cardinality rules
 - Referential integrity rules
 - Process rules(see following slides)

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Definitional Rules

- Determine the definition of entities and attributes
- Most commonly implemented as data type, precision and scale
- Rules that cannot be implemented may be reflected in entity and attribute descriptions

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Data Validation Rules

- Determine the required characteristics of data that is stored
- Can be implemented using check constraints and foreign keys to reference tables
- Reference tables are generally viable only for discrete sets of values
- If subtypes are generalized (rolled up into the supertype), data validation rules probably require generalization as well
- Cannot be implemented for attributes dependent on the values of other attributes

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Data Derivation Rules

- Methods by which derived data items are calculated
- Not directly supported in data models, but derived attributes may show the results of derivations

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Cardinality Rules

- Determine how many of one entity or attribute can be associated with another entity or attribute
- For attributes, implemented:
 - By placement of attribute in an entity
 - By optionality (null versus not null)
- For entities, implemented as relationship cardinality.
 - Except rules requiring specific cardinality (e.g. manager must have between 2 and 6 subordinates)

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Referential Integrity Rules

- Require that foreign key values have a matching key value in the parent entity
- Implicit in the relationships defined in the model
- Care must be taken if primary key values are subject to change
- May require tradeoffs when models are generalized

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Process Rules

- Determine what processing the system must do in particular circumstances
- Except for the data that is supported by or created by the processes, process rules are generally out of scope for the data modeler

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Rules in the Database Versus Application Code

- Unstable rules can be in data values, but should never be in data structures
- Data values can generally be changed more quickly than logic
- Complex rules may always require logic changes

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