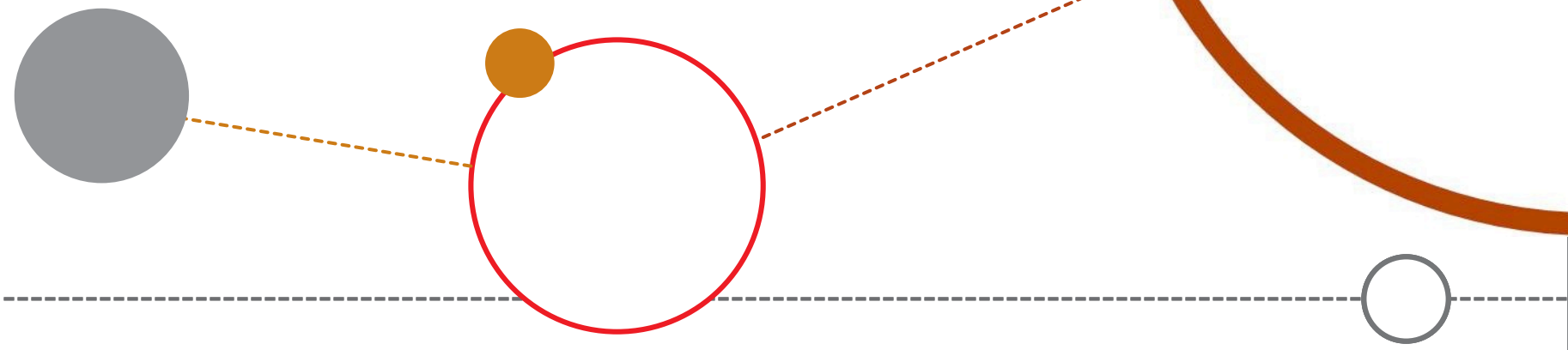
UNIVERSITY OF WEST LONDON
The Career University

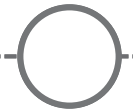
Entity Relationship Diagram 2/3

School of Computing and Engineering



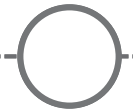
Learning Objectives

- Explain the rules and style guidelines for creating ERD
- Identify ERD elements
- Describe ERD
- Create an ERD
- Define Data Dictionary

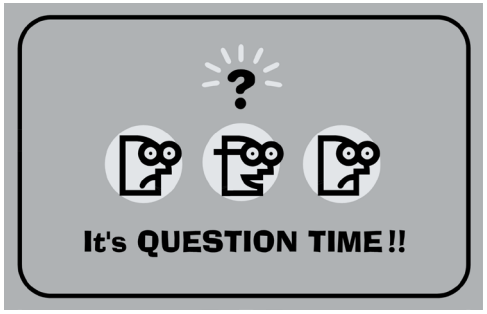


Lecture Plan

- Recap from the last lecture 5min
- Entity Relationship Diagram 35min
- Class Exercise 15min



Recap from the previous lecture



- What is an entity and their attributes?
- Identify entities and their relationships for the given scenario.

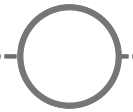
Entity and Attributes

Entity: a person, place, object, event or concept in the user environment about which data is to be maintained.

- The entity is the basic building block for a data model. It is a person, place, event, or thing about which data is collected. E.g. an employee, an order and a product

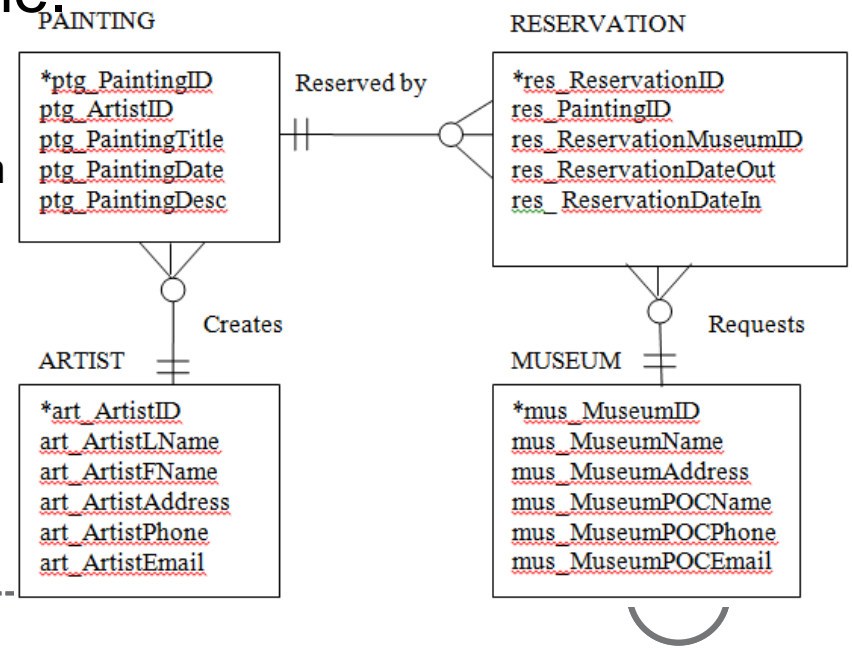
Attribute: a named property or characteristic of an entity that is of interest to the organization.

An attribute is some type of information that is captured about an entity.



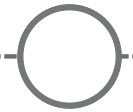
Identifier/Primary key

- One or more attributes can serve as the identifier (primary key).
- Identifier can uniquely identify one instance of an entity.
- Attributes that serve as the identifier are noted by an asterisk next to the attribute name.
  - ptg_PaintingID is an identifier for Painting
  - res_ReservationID is an identifer for Reservation



Building ERD

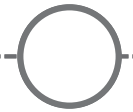
- Step 1: Identify the entities
- Step 2: Add Attributes and assign identifiers
- Step 3: Identify Relationships:
  - Relationships names
  - Cardinalities
  - Modalities



ERD Element	Kinds of Metadata	Example
Entity	Name	Item
	Definition	Represents any item carried in inventory in the supermarket
	Special notes	Includes produce, bakery, and deli items
	User contact	Nancy Keller (x6755) heads up the item coding department
	Analyst contact	John Michaels is the analyst assigned to this entity
Attribute	Name	Item_UPC
	Definition	The standard Universal Product Code for the item based on Global Trade Item Numbers developed by GS1
	Alias	Item Bar Code
	Sample values	036000291452; 034000126453
	Acceptable values	Any 12-digit set of numerals
	Format	12 digit, numerals only
	Type	Stored as alphanumeric values
	Special notes	Values with the first digit of 2 are assigned locally, representing items packed in the store, such as meat, bakery, produce, or deli items. See Nancy Keller for more information.
Relationship	Verb phrase	Included in
	Parent entity	Item
	Child entity	Sold item
	Definition	An item is included in zero or more sold items. A sold item includes one and only one item.
	Cardinality	1:N
	Modality	Null
	Special notes	

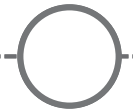
ERD general design guidelines

- Labels and naming conventions are important for creating clear ERDs. Names should not be ambiguous:
  - Name and number
- The name should be consistent across the model and reflect the terminology used by the business.
- If people who order product are called customer in the business in the model they should be an entity called customer (not client or stakeholder).
- There are no rules covering the layout of ERD components. They can be placed anywhere you like on the page. Although most systems analysts try to put the entities together that are related to each other.

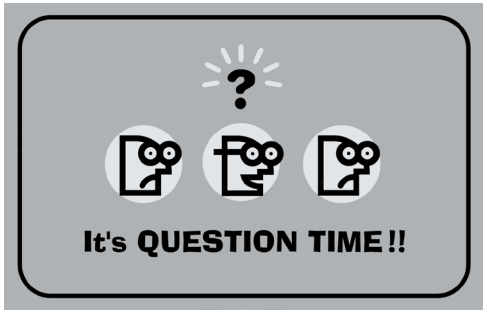


Entity types

- **Independent Entity**: Is an entity that can exist without the help of another entity. Attributes from other entities were not needed to uniquely identify instances of these entities. Independent entity is shown as rectangle with single border line.
- **Dependent Entity**: There are situations when an entity does require attributes from another entity to uniquely identify an instance. This entity is called a dependent entity and its identifier consists of at least one attribute from the other entity. A dependent entity is shown as a rectangle with double border line.
- **Intersection Entity**: Intersection entities are added to a data model to store information about two entities sharing many to many relationship in order to remove the man-to-many relationship.



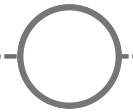
Question

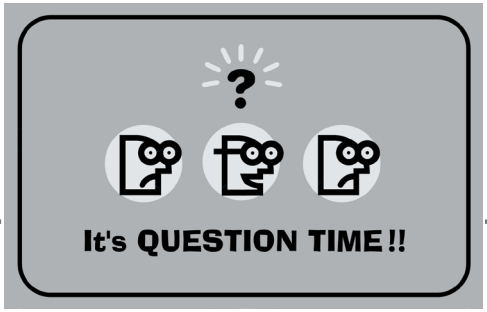


- What is the purpose of developing an identifier for an entity?

Answer

- One of the aspects of the definition of an entity is the fact that there are multiple occurrences of the entity. If there are not multiple instances of something that is a potential entity, that something is not an entity in the system. Consequently, there must be a way of identifying each individual occurrence of an entity so that it can be picked out from amongst all the other instances of the entity. That is the purpose of having identifiers with unique values.



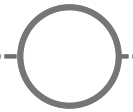


Class Exercise

- A publishing company produces scientific books on various subjects. The books are written by authors who specialize in one particular subject. The company employs editors who, not necessarily being specialists in a particular area, each take sole responsibility for editing one or more publications. A publication covers essentially one of the specialist subjects and is normally written by a single author. When writing a particular book, each author works with on editor, but may submit another work for publication to be supervised by other editors. To improve their competitiveness, the company tries to employ a variety of authors, more than one author being a specialist in a particular subject.

Tasks

- Identify entities
- Add your attributes and identifier for each entity.
- Identify relationships.
- Identify the following entitles:
  - Independent Entity
  - Dependent Entity
  - Intersection Entity



References

- Dennis, A., and Wixom, B. H, “Systems Analysis and Design”, 5th Edition, John Wiley & Sons (2013), Chapter Six.
- Hoffer, J. A., George, J. F., Valacich J. S., “Modern Systems Analysis and Design”, 7th Edition, Pearson Education. Chapter Eight.