Entity Relationships

describe relational databases and their use

When developing databases, the "entity-relationship" model is used.

An **entity relationship model** (or ER model) is used to represent the data that is used in an ICT system.

An entity relationships model has three components:

- Entities
- Attributes
- Relationships

An **entity** is an object that you wish to store information about. For example an entity could be:

- A book in a library.
- A person who works in an organisation.
- An A' Level course in your school or college.

An **attribute** is an item of data that can be used to identify, classify or describe an entity.

For example:

Entity	Attributes
Book	Title, Author, ISBN Number
Person	First Name, Last Name, Date of Birth
A' Level Course	Title, Tutor, Room

Each entity must have a **unique attribute** that is used to identify each instance of the entity.

For example:

- The ISBN Number for each book title is unique.
- Each person who works in an organisation could be allocated a pay number.
- Each A' Level course in a school or college could be given a course code.

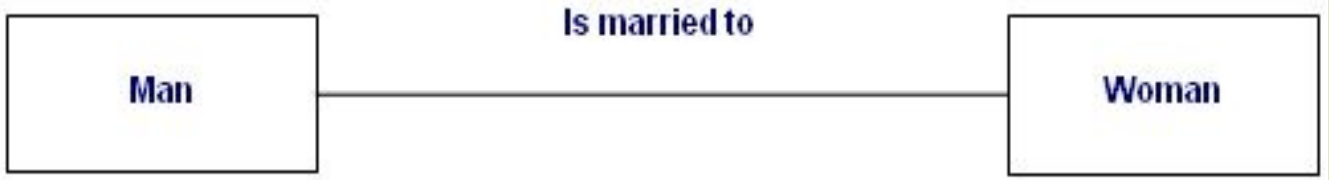
Entity relationship diagrams are used to show how entities are related to each other. A relationship is represented as a line between boxes that represent the entities that are linked.

Relationships can be:

- **One-to-one**, an entity of type A can only match with one entity of type B.

  Example:

  In a monogamous society, you can only marry one person at a time.



- **One-to-many**, an entity of type A can match with many entities of type B.

  Example:

  A manager in an organisation manages many employees, but each employee only has one manager.

- **Many-to-many**, an entity of type A can match with many entities of type B and an entity of type B can match with many entities of type A.

  Example:

  A tutor teaches many students and a student is taught by many tutors.

The following procedure is used to construct an ER model:

- Identify the entities.
- List the attributes for each entity.
- Identify a unique attribute for each entity.
- Define the relationships between entities.

ER modelling is an **iterative** process. You may find that you have to keep refining a model until you are happy with it.
There will not necessarily be a right answer to a scenario that you model, but some solutions will be better than others.

http://www.cpanel.stpaulsscience.org/gceict/specifications/aqa/unit3/devsolutions/ermodel/intro.htm