

Worked Example - 2

Worked Example

- The COMPANY database keeps track of a company's employees, departments, and projects. After the requirements collections and analysis phase, the database designers provide the following description of the *miniworld* - the part of the company that will be represented in the database.
- The company is organised into departments. Each department has a unique number, a unique name, and up to 3 phone numbers.
- A department is managed by one manager (employee). We keep track of the start date when the employee began managing the department.
- A department will have a minimum of 4 employees assigned to it.

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- A department may control a number of projects, each of which has a unique code, a unique title, location, and budget.
- We store each employee's PPS number, name, address, salary, gender, and date of birth.
- An employee is assigned to one and only one department, but may work on several projects. We keep track of the current number of hours that an employee works on each project.

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- We also keep track of the direct supervisor of some employees (who is another employee).
- We want to keep track of the dependents of each employee for insurance purposes We keep each dependent's first name, gender, date of birth, and relationship to the employee.

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- *Step 1.1 Identify Entity types*
 - Strong Entity Types: Employee, Department, and Project
 - Weak Entity: Dependent

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- *Step 1.2 Identify Relationship types*
 - Employee 4..* **worksFor** 1..1 Department
 - Employee 1..1 **manages** 0..1 Department
 - Employee 0..1 **supervises** 0..* Employee
 - Employee 1..1 **has** 0..* Dependent
 - Employee 1..* **worksOn** 0..* Project
 - Department 1..1 **controls** 0..* Project

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- *Step 1.3 Identify and associate attributes with entities or relationships*
- **Entity Type attributes:**
 - **Department:** deptNumber, deptName, phoneNumber
 - **Employee:** PPS, name, address, salary, gender, DOB
 - **Dependent:** fName, gender, DOB, relationship
 - **Project:** projCode, title, location, budget

Worked Example

- **Relationship Type attributes:**
- There is a requirement to record the *startdate* that each Employee starts managing a given Department.
- There is also a requirement to record the *hours* that each Employee spends working on a given Project.
- ***Step 1.4 Determine attribute domains***
- In the data dictionary record the allowable set of values for the attribute; and the size and format of the attribute.

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- *Step 1.5 Determine candidate, primary, and alternate key attributes*
 - **Department:** Candidate keys: deptNumber, deptName,
Primary Key deptNumber
 - **Employee:** Candidate keys: PPS, name and address
Primary Key PPS
 - **Dependent:** Will deal with this in Logical Data Model
 - **Project:** Candidate keys: projCode, title
Primary key projCode

