Comparison between initial ERD model with the ERD generated by the DBMS

When comparing the initial ERD model (first image) with the ERD generated by the DBMS (second image), here's a detailed analysis of their similarities and differences:

1. Entities (Tables) Comparison

- **Employee**:
  - **Initial ERD**: Defined as a superclass with attributes EmNo, Surname, FirstName, Address, Telephone.
  - **DBMS-Generated ERD**: Matches exactly with the employee table having columns em_no, surname, first_name, address, telephone.
  - **Conclusion**: **Match**.
- **Doctor**:
  - **Initial ERD**: Subclass of Employee with an additional attribute Specialty.
  - **DBMS-Generated ERD**: doctor table includes em_no (foreign key referencing employee) and specialty.
  - **Conclusion**: **Match**.
- **Nurse**:
  - **Initial ERD**: Subclass of Employee with additional attributes Salary and Rotation.
  - **DBMS-Generated ERD**: nurse table includes em_no (foreign key referencing employee), salary, rotation, and ward_id (foreign key referencing ward).
  - **Conclusion**: **Match**.
- **Patient**:
  - **Initial ERD**: Defined with attributes PatientNo, Name, Surname, TelNo, Address.
  - **DBMS-Generated ERD**: patient table includes patient_no, name, surname, tel_no, address.
  - **Conclusion**: **Match**.
- **Department**:
  - **Initial ERD**: Defined with attributes DepCode, DepName, Building.
  - **DBMS-Generated ERD**: department table includes dep_code, dep_name, building, and director_id (foreign key referencing employee).
  - **Conclusion**: **Match**.
- **Ward**:
  - **Initial ERD**: Defined with attributes WardNo and BedNo.
  - **DBMS-Generated ERD**: ward table includes ward_no, bed_no, and department_id (foreign key referencing department).

    - **Conclusion**: **Match**.
- **Hospitalisation**:
    - **Initial ERD**: Defined with attributes `Diagnosis` and `BedNo`.
    - **DBMS-Generated ERD**: `hospitalization` table includes `id`, `diagnosis`, `bed_no`, `patient_id` (foreign key referencing `patient`), and `ward_id` (foreign key referencing `ward`).
    - **Conclusion**: **Match**.

2. Attributes (Columns) Comparison

- All attributes from the initial ERD are present in the DBMS-generated ERD with appropriate data types.
- **Data Types**: The initial ERD does not specify data types, while the DBMS-generated ERD uses:
    - `int` for identifiers like `em_no`, `dep_code`, `ward_no`, `patient_no`, etc.
    - `varchar` for text attributes like `surname`, `specialty`, `address`.
    - `decimal` for `salary` in `nurse`.

3. Relationships Comparison

- **Inheritance** (`is a`):
    - **Initial ERD**: Shows `Doctor` and `Nurse` inheriting from `Employee`.
    - **DBMS-Generated ERD**: Represented using foreign keys (`em_no` in `doctor` and `nurse` referencing `em_no` in `employee`).
    - **Conclusion**: **Match**.
- **Associations**:
    - **Director Of**: `Employee` to `Department` is represented by `director_id` in `department` referencing `em_no` in `employee`.
    - **Treats**: `Doctor` to `Patient` relationship is not explicitly shown in the DBMS ERD. It might need a separate table or is inferred from other associations.
    - **Has**: `Patient` to `Hospitalisation` is represented by `patient_id` in `hospitalisation` referencing `patient_no` in `patient`.
    - **Belongs**: `Hospitalisation` to `Ward` is represented by `ward_id` in `hospitalisation` referencing `ward_no` in `ward`.
    - **Is supervised by**: `Nurse` to `Ward` is represented by `ward_id` in `nurse` referencing `ward_no` in `ward`.
    - **Has**: `Department` to `Ward` is represented by `department_id` in `ward` referencing `dep_code` in `department`.

4. Key Differences

- **Table Structure**:
    - The DBMS-generated ERD represents the schema as it is in the database, showing actual table names, data types, and constraints.
    - The initial ERD is more conceptual, focusing on entities and relationships without specific database implementation details.
- **Data Types and Constraints**:
    - The initial ERD does not specify data types or constraints (e.g., `int`, `varchar`, `decimal`), while the DBMS ERD does.
    - The DBMS-generated ERD shows primary keys, foreign keys, and their data types.
- **Visual Representation of Relationships**:
    - The initial ERD uses conceptual lines and notation to denote relationships (like inheritance, one-to-many).
    - The DBMS-generated ERD shows actual foreign key constraints and connections between tables.

Conclusion

The DBMS-generated ERD aligns well with your initial ERD model in terms of entities, attributes, and relationships. The main differences lie in the specifics of database implementation (data types, actual table names, foreign key constraints) that are shown in the DBMS-generated diagram but not in the initial ERD.

Overall, the two diagrams are consistent with each other, and the DBMS-generated ERD accurately represents the schema based on your initial design. If there are specific relationships or entities missing or represented differently than intended, adjustments may be needed either in the database schema or in the ERD design to ensure full alignment.