

ENSF 607/608 Project Conceptual + Logical DB Design

Course: ENSF 608

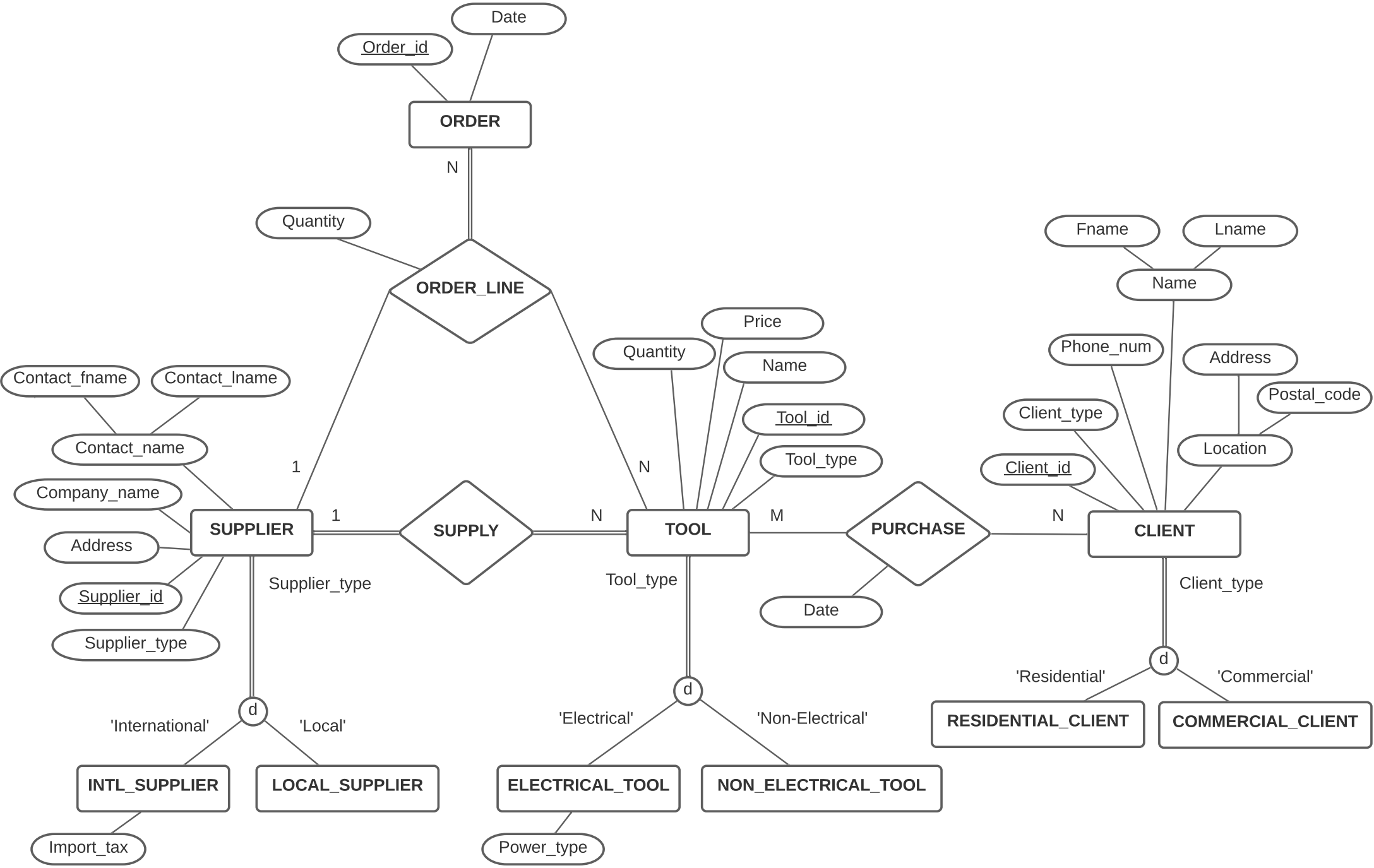
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Design Decisions and Assumptions

- SUPPLIER, TOOL, and CLIENT are regular entity types with attributes based on the Requirement description. Each entity type has subclasses/inherited entity types. An international supplier has a import_tax field, so I've included that as an attribute; I assume the method to calculate import tax is handled by the management system (ENSF 607). Since SUPPLIER, TOOL, and CLIENT each have a type-related attribute already, this is used for specializations. I've decided to have total participation and disjoint inheritance for each. As such, some specializations will not have additional attributes. My decision is based on future-proofing considerations; for example, a new SUPPLIER specialization is possible by specifying a new Supplier_type value. We could also add more attributes to LOCAL_SUPPLIER in the future, for example.
- ORDER entity type is used to track order information. Order_id corresponds to the random 5-digit id. I assume that this ID is randomly generated id by the management system (scope of ENSF 607) and simply stored to the database. It also tracks the date of the order. I believe that Date can be partial key based on the narrative; however, I keep it as a simple attribute since Order_id is already a distinctive attribute.
- SUPPLY is a relationship between SUPPLIER entities and TOOL entities. I decided on a one-to-many relationship since a supplier can supply multiple tools, but a tool can only be supplied by a single supplier. I also assume total participation by both entity types which means each tool has to be supplied a supplier, and vice versa.
- ORDER_LINE is a ternary relationship between ORDER, SUPPLIER, and TOOL. It also has a relationship attribute Quantity which to track the amount ordered. ORDER has total participation since I consider order lines as fundamental parts of an order. I assume that not all SUPPLIER and TOOL entities have to be ordered; thus, they only have partial participation. Since I assume that a tool can only be supplied from a single supplier, this makes the cardinality constraints as one-to-many-to-many for order lines.
- PURCHASE relationship is my design solution for connecting CLIENT entity type with the rest of the database. It isn't part of the Requirements description so I decided to make a simple relationships between CLIENT and TOOL. This represents a client (customer) who purchases tools. It is a many-to-many relationships assuming that a client can purchase many tools and a tool can be purchased by many clients. It has an attribute Date which represents the date of purchase.

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ENSF 607/608: Project Logical Database Design

