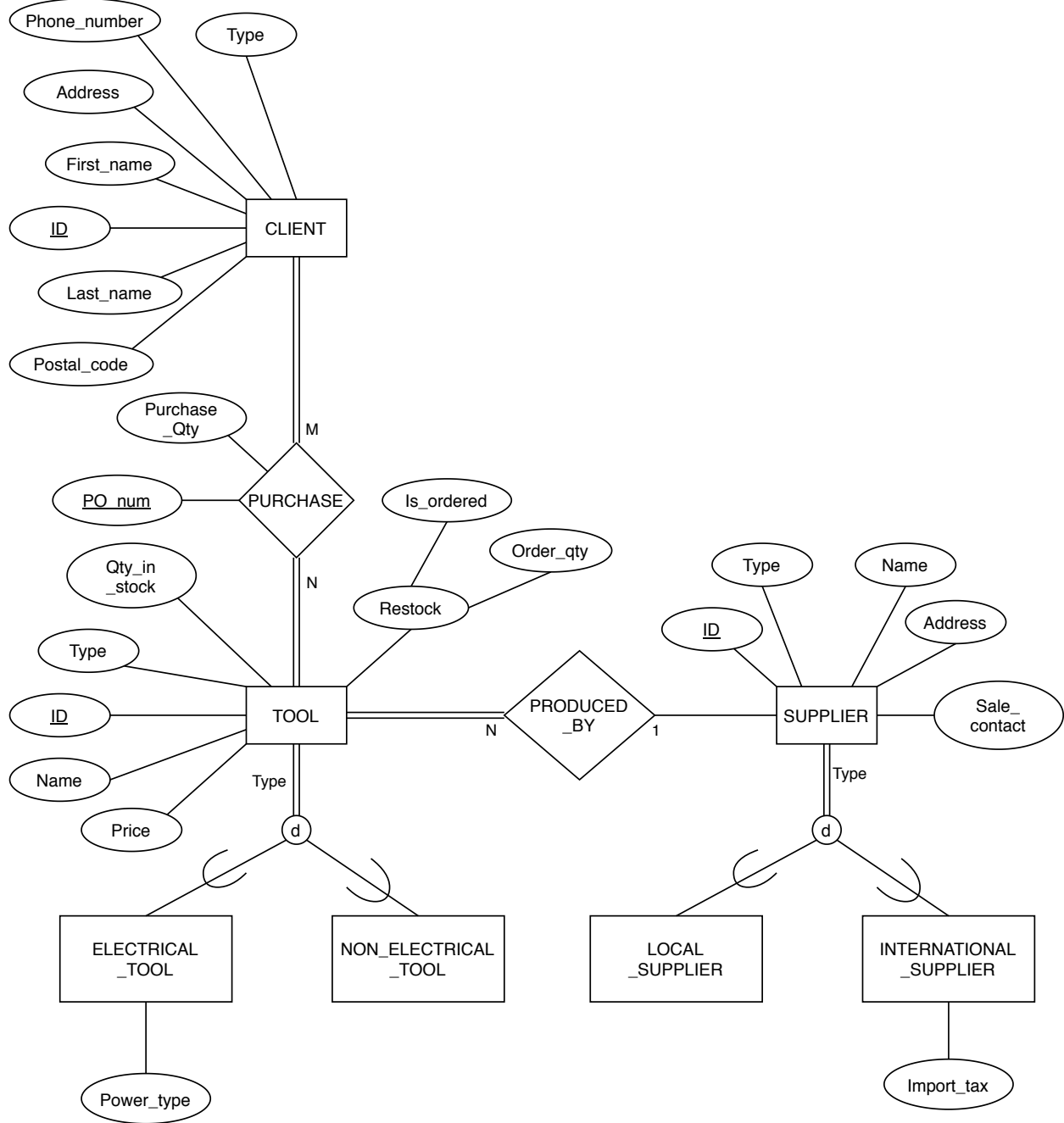


# ENSF 608 Project

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# Conceptual Database Design



## Design Explanation

From the software requirement, I identified three entities: TOOL, SUPPLIER, and CLIENT. TOOL is identified by its key attribute ID, it also has simple attributes including Type, Name, Qty\_in\_stock, and Price; as well as a composite attribute Restock which consists of simple attributes Is\_ordered and Order\_qty (it is assumed that the database will only track order-lines made on the current date). TOOL can be further grouped into ELECTRICAL\_TOOL and NON\_ELECTRICAL\_TOOL for an attribute-defined specialization (based on Type). This is a total disjoint specialization. ELECTRICAL\_TOOL and NON\_ELECTRICAL\_TOOL inherits the attributes from TOOL; ELECTRICAL\_TOOL also have a local attribute Power\_type.

SUPPLIER is identified by its key attribute ID, as well as simple attributes Type, Name, Address, and Sale\_contact. SUPPLIER can be further grouped into LOCAL\_SUPPLIER and INTERNATIONAL\_SUPPLIER for an attribute-defined specialization (based on Type). This is a total disjoint specialization. LOCAL\_SUPPLIER and INTERNATIONAL\_SUPPLIER inherits the attributes from SUPPLIER; INTERNATIONAL\_SUPPLIER also have a local attribute Import\_tax.

Every TOOL item is manufactured by a SUPPLIER, and a SUPPLIER can manufacture multiple TOOL items, making it a 1: N relationship between TOOL and SUPPLIER. TOOL have total participation in this relationship. SUPPLIER has partial participation as they may exist in the database because of old merchandise that the shop carries.

CLIENT is identified by its key attribute ID, as well as simple attributes First\_name, Last\_name, Address, Postal\_code, Phone\_number, and Type (Residential or Commercial). The same TOOL item can be purchased by multiple CLIENT and a CLIENT can purchase multiple TOOL items at once, making it a M:N relationship between TOOL and CLIENT. Both the CLIENT and TOOL have total participation in this relationship because CLIENT information is only saved onto the database when they make a purchase and a purchase consist of sales of at least one TOOL items. The relationship PURCHASE is identified by key attribute PO\_number (a CLIENT can purchase the same TOOL items multiple times) and simple attribute Purchase\_Qty.

# Logical Database Design

