HW4 (EER for Luke's Importing Company) Solution

Per the requirements the following entities are contained in the procurement system: purchasing agents, receiving clerks, stores, purchased items, shippers, shipments, and details about the receipts of those shipments.

The following entities can be created immediately. **Purchasing Agent**, **Receiving Clerk**, **Store**, **Purchased Item**, **Shipper**, and **Shipment**.

Purchasing agents make purchases from stores that contain one or more purchased items. This indicates a ternary entity named **Purchase** that joins **Purchasing Agent**, **Store**, and **Purchased Item**. The **Purchase** entity should be a separate entity because it should contain the purchase method and the purchase date/time as attributes. A **Purchasing Agent** may have zero or more **Purchase**s. A **Purchase** has one and only one **Purchasing Agent**. A **Purchase** is made from one and only one **Store**, but zero or more **Purchase**s may have been made from that **Store**. A **Purchase** must contain one or more **Purchased Item**s, and each **Purchased Item** belongs to one and only one **Purchase**.

Every time the same item is purchased the information about that item will need to be recorded (i.e., name, description, etc.). It would make sense to separate out information about the item that does not change into a separate entity named **Item Description**. Each **Item Description** will have one or more associated **Purchased Item**s and each **Purchased Item** is associated with one and only one **Item Description**. When choosing items to be added to a purchase those items should come from a list of **Item Description**s. This has the added benefit of standardizing the list of items (i.e., so two different purchases of the same item do NOT have different names or descriptions).

NOTE: There is no relationship between Store and Item Description because that would require Luke Importing to keep track of inventory in the stores it buys from. This is not standard practice and involves unnecessary work not dictated in the requirements.

Shipments contain one or more purchased items. **Purchased Item**s belong to zero **Shipment**s while they are waiting to be shipped OR one (and only one) **Shipment** once they have been shipped. When a **Shipment** is created an ID of some sort (possibly a "tracking number"), the date the shipment was shipped, and the **Shipper** are all required. Each **Shipment** has one and only one **Shipper**. Each **Shipper** may have shipped zero or more **Shipment**s.

When a **Purchased Item** is added to a **Shipment** the insured value of the **Purchased Item** must be specified. The insured value can be NULL prior to the time that the **Purchased Item** is added to a **Shipment**.

When a **Shipment** arrives at Luke's Imports the **Shipment** is updated by a receiving clerk with the arrival date/time, the arrival condition of each item in the shipment, and the name of the receiving clerk. Each **Shipment** is received by zero **Receiving Clerk**s (while in route) and then by one and only one **Receiving Clerk** upon arrival at Luke's Importing. Each **Receiving Clerk** may have received zero or more **Shipment**s.

Each **Purchased Item** that is part of the **Shipment** has an "arrival condition" attribute that is updated by the receiving clerk upon arrival.

Since **Receiving Clerk**s and **Purchasing Agent**s are both employees of Luke Importing and, as such, have numerous shared properties (i.e., First Name, Last Name, Employee ID, etc.) a generalized entity of **Employee** should be created. The supertype – subtype relationship uses PARTIAL SPECIALIZATION (because there might be **Employee**s that are neither a **Purchasing Agent** nor a **Receiving Clerk**) that is OVERLAPPING (because **Employee**s can be either a **Purchasing Agent**, or a **Receiving Clerk**, or both).

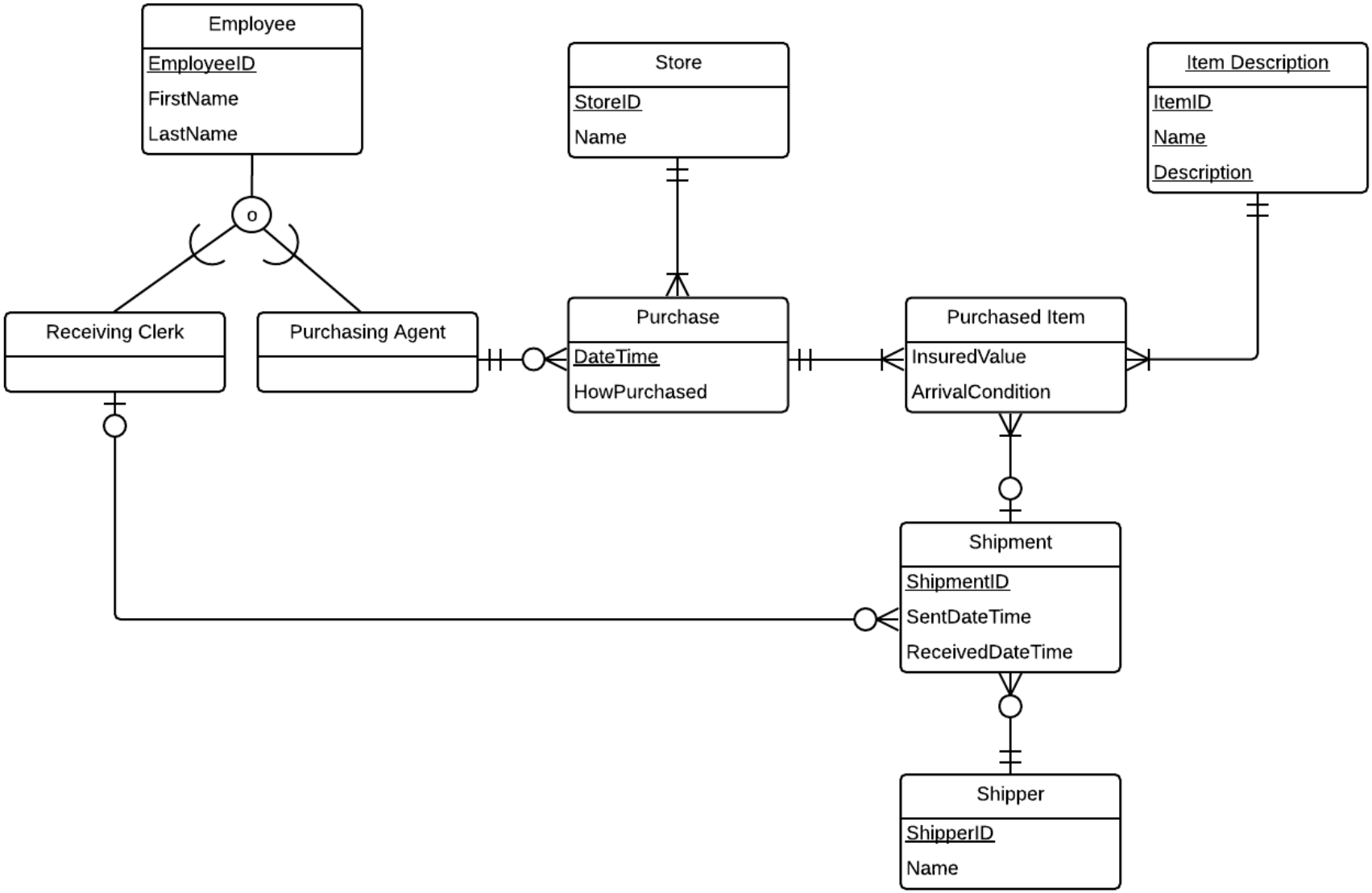

Figure 1. Enhanced Entity Relationship (EER) Diagram