

Northeastern University
DAMG6210 - Data Management and Database Design

TEAM 10

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PROJECT TOPIC: Warehouse Management System

PROBLEM STATEMENT:

- The most common issue that businesses face is the lack of a standardized system for listing, tracking, and stocking inventory data, which slows down the business process
- Since inventory data is only kept manually in the logbook and is not well organized, it is difficult for the administrator to record it quickly and safely, which adds time to the process
- It's tough to keep track of whether things are in or out of stock on a regular basis
- Receiving, putaway, picking, packing, and shipping are complex steps which create a lot of inaccuracy if not done well
- It's difficult to navigate merchandise that are kept/arranged in different racks at random

OBJECTIVES:

- The system should keep a record of all the items in the warehouse
- The system will cross-check the stock availability status in order to accept any new orders, and update the stock accordingly
- The system keeps track of the location of items in the warehouse
- The system can place purchase orders with the vendor to restock inventory
- The system keeps track of order fulfillment process which includes picking, packing and dropping to pick up zone

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PROPOSED SOLUTION:

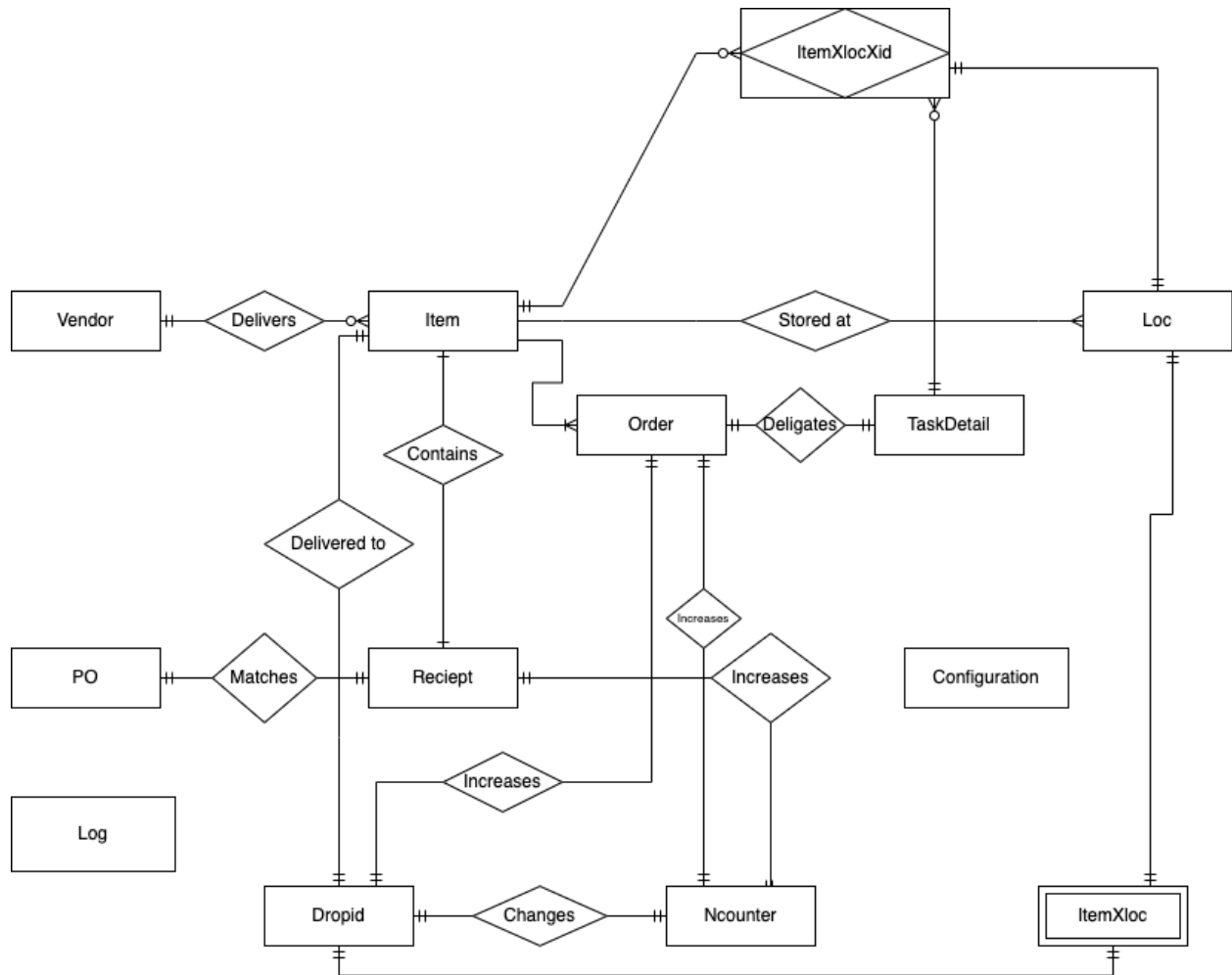
- Activities such as order selection, packaging, and shipping to improve storage space are automated to maximize efficiency
- Inventory is assigned to exact locations including proper zones and racks to optimize and speed up the picking process
- Once the inventory reaches the threshold, the system will identify and place the purchase order for restocking inventory
- Picking, packaging, shipping tasks will be generated in the system after order is received
- Tasks will be generated which will specify the location of the item to be picked and dropped to save labor cost and improve efficiency.

DATABASE IDENTIFICATION:

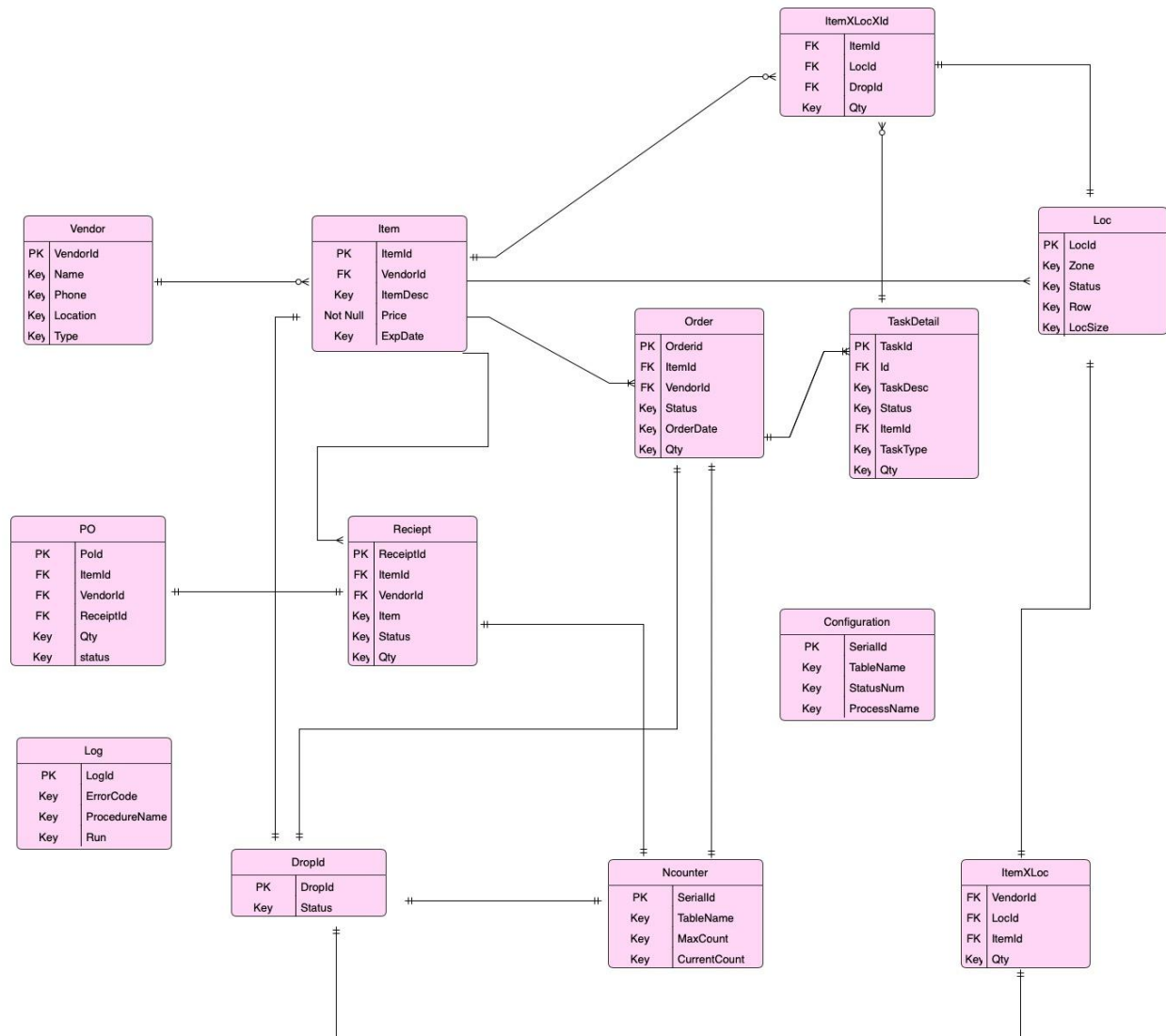
Following are the Main Entities and Attributes

Entity Name	Attributes	Description/Meaning
PO	PoId	Purchase Order is a Unique identifier to each order placed
Item	ItemId	Item ID is a unique identifier assigned to each item.
Receipt	ReceiptId	Receipt ID is a unique identifier assigned to each receipt.
Loc	LocId	Loc ID is a unique identifier assigned to each location.
Order	OrderId	Order ID is a unique identifier assigned to each order received.
Vendor	VendorId	Vendor ID is a unique identifier assigned to each vendor.
Configuration	SerialId	Serial ID is a unique identifier assigned to each row .
Drop	DropId	Drop ID is a unique identifier assigned to each box/pallet.
Counter	SerialId	Serial ID is a unique identifier assigned to each row as an increment for new row addition .
Task	TaskID	Task ID is a unique identifier assigned for different task
ItemXLoc	Loc ID, Item ID	Combination of this will let us know the location of Item.
ItemXLocXId	Item ID, Loc ID, Drop ID	Combination of this will let us know the box at which location is put with which Item.
Log	LogID	LogID is a unique identifier assigned in log table for each run

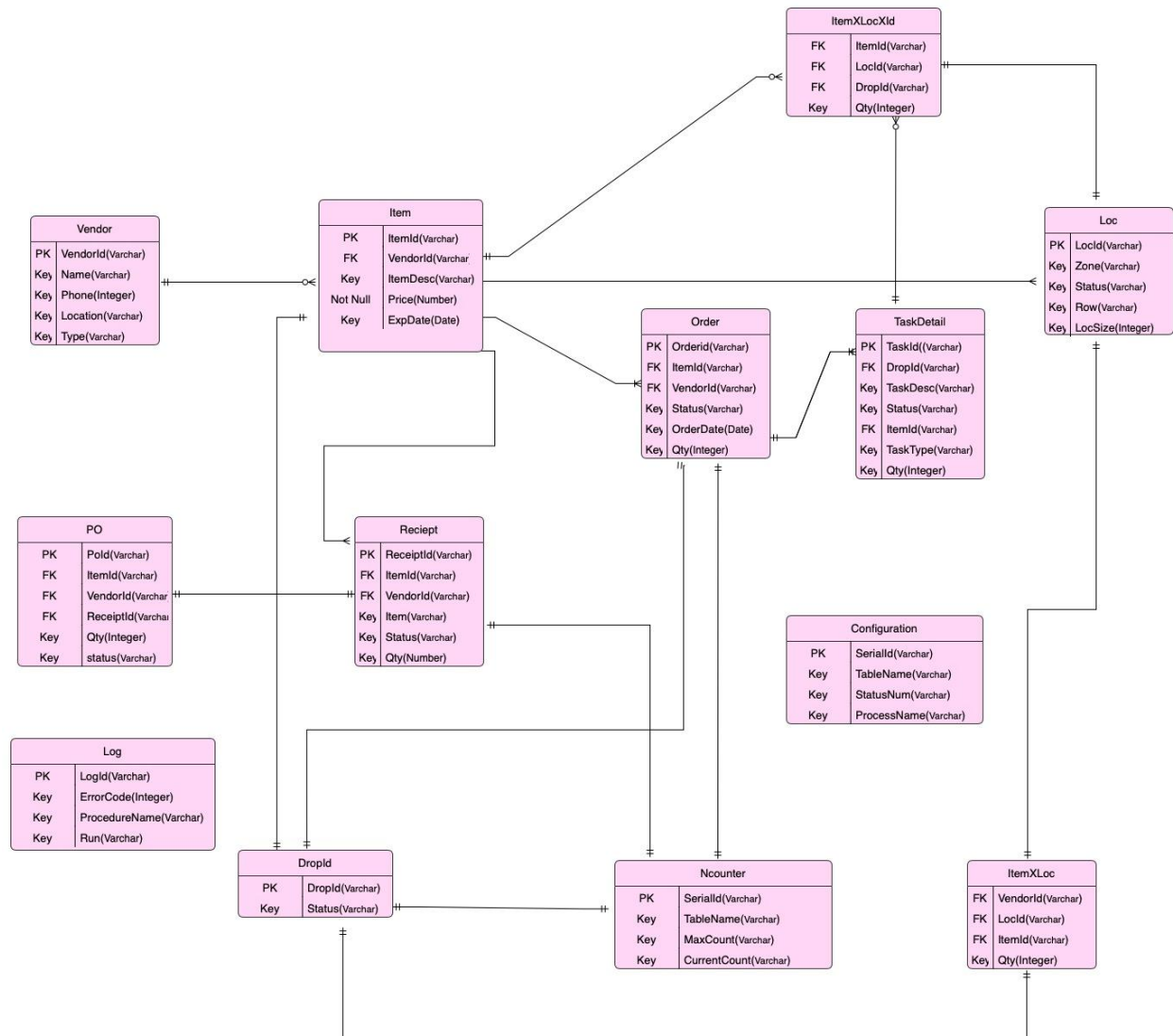
CONCEPTUAL DIAGRAM



E-R DIAGRAM (Logical diagram)



E-R DIAGRAM (Physical diagram)



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ITEM ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
ItemId	VARCHAR (20)	PRIMARY KEY, AUTO GENERATED
ItemDesc	VARCHAR (200)	NOT NULL
Price	NUMBER(10,2)	NOT NULL
ExpDate	DATE	NOT NULL
VendorId	VARCHAR(20)	NOT NULL, Foreign Key, vendorid from the vendor entity

LOC ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
LocId	VARCHAR (20)	PRIMARY KEY, AUTO GENERATED
Zone	VARCHAR (32)	NOT NULL
Status	VARCHAR (32)	NOT NULL
Row	VARCHAR (32)	NOT NULL
LocSize	INTEGER	NOT NULL

ORDER ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
OrderId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
ItemId	VARCHAR(20)	NOT NULL , Foreign Key, itemid from the item entity
Status	VARCHAR (3)	NOT NULL
VendorId	VARCHAR(20)	NOT NULL, Foreign Key, vendorid from the vendor entity
OrderDate	DATE	NOT NULL
Qty	INTEGER	NOT NULL

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RECEIPT ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
ReceiptId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
ItemId	VARCHAR(20)	NOT NULL, Foreign Key, itemid from the item entity
VendorId	VARCHAR(20)	NOT NULL, Foreign Key, vendorid from the vendor entity
ItemDesc	VARCHAR (200)	NOT NULL
Status	VARCHAR (3)	NOT NULL
Qty	Number	NOT NULL

VENDOR ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
VendorId	VARCHAR (20)	PRIMARY KEY, AUTO GENERATED
Name	VARCHAR (32)	NOT NULL
Phone	INTEGER	NOT NULL
Location	VARCHAR (32)	NOT NULL
Type	VARCHAR (3)	NOT NULL

CONFIGURATION ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
SerialId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
TableName	VARCHAR (32)	NOT NULL
StatusNum	VARCHAR(3)	NOT NULL
StatusDesc	VARCHAR (32)	NOT NULL

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NCOUNTER ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
SerialId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
TableName	VARCHAR (32)	NOT NULL
MaxCount	VARCHAR (32)	NOT NULL
CurrentCount	VARCHAR (32)	NOT NULL

DROP ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
DropId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
Status	VARCHAR (3)	NOT NULL

LOG INVENTORY ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
LogID	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
ErrorCode	INTEGER	NOT NULL
ProcedureName	VARCHAR(50)	NOT NULL
Run	VARCHAT(20)	NULL/NOT NULL

PURCHASE ORDER ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
PoId	VARCHAR(20)	PRIMARY KEY, AUTO GENERATED
ItemId	VARCHAR(20)	NOT NULL, Foreign Key, itemid from the item entity
VendorId	VARCHAR(20)	NOT NULL, Foreign Key, vendorid from the vendor entity
ReceiptId	VARCHAR(20)	NOT NULL, Foreign Key, receiptid from the receipt entity

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Qty	INTEGER	NOT NULL
Status	VARCHAR (3)	NOT NULL

ITEMXLOC ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
LocId	VARCHAR(20)	NOT NULL, Foreign Key, locid from the loc entity
ItemId	VARCHAR(20)	NOT NULL, Foreign Key, itemid from the item entity
VendorId	VARCHAR(20)	NOT NULL, Foreign Key, vendorid from the vendor entity
Qty	INTEGER	NOT NULL

ITEMXLOCXID ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
LocId	VARCHAR(20)	NOT NULL, Foreign Key, locid from the loc entity
ItemId	VARCHAR(20)	NOT NULL, Foreign Key, Itemid from the item entity
DropId	VARCHAR(20)	NOT NULL, Foreign Key, DropId from the DropId entity
Qty	INTEGER	NOT NULL

TASK ENTITY

ATTRIBUTES	DATA TYPE	COMMENTS
TaskId	VARCHAR(20)	NOT NULL, Foreign Key, locid from the loc entity
TaskDesc	VARCHAR(200)	NOT NULL
ItemId	VARCHAR(20)	NOT NULL, Foreign Key, Itemid from the item entity
DropId	VARCHAR(20)	NOT NULL, Foreign Key, DropId from the

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		DropId entity
Status	VARCHAR(3)	NOT NULL
TaskType	VARCHAR (30)	NULL/NOT NULL
Qty	INTEGER	NOT NULL