Order Management – The Data Warehouse Toolkit

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# Case Facts

The next business process to be implemented into the data warehouse is the procurement process. Unlike the inventory and retail sales, the procurement business process has a few unique challenges. One challenge is the though the tasks within the process are similar, they are treated separately. There are several different data sources that create that data related to procurement. In addition, there are different dimensions that come into play in certain situations. For example, discounts taken are only applicable to vendor payments, but not other transaction types. Also, an employee’s name may be important to document for the receipt of goods at the warehouse but doesn’t apply at any other point in the procurement process. A third example is that different control numbers are important at different points of the procurement process such as a receipt number (warehouse receipts) or tracking number (shipping). For these reasons, it is better to separate the steps in procurement process into their own fact tables.

# Data Warehouse Concepts

## Step 1: Select the Business Process

The procurement process is divided up into several individual processes:

* Purchase Requisitions – Marketing identifies the demand for products and estimates the number of supplies needed to fulfill the company’s projected needs.
* Purchase Orders – The grocery store submits orders to vendors for the goods needed when the purchase requisition is approved.
* Shipping Notifications – The vendors notify the grocery stored when their goods are being shipped.
* Warehouse Receipts – Upon receiving the goods from shipment to the warehouse, a warehouse receipt is generated.
* Vendor Invoices – Vendors submit their bill for the goods ordered upon completion of the purchase order.
* Vendor Payments – The grocery store submits a payment to the vendor to complete their order in response to a vendor invoice.

## Step 2: Declare the Grain

* Purchase Requisitions – One row per requisition line
* Purchase Orders – One row per purchase order line
* Shipping Notifications – One row per shipping notice line
* Warehouse Receipts – One row per receipt line
* Vendor Invoices – One row per invoice line
* Vendor Payments – One row per payment line

## Step 3: Identify the Dimensions/Attributes

* Vendor: Vendor Key (PK), Vendor Name, Vendor Address, Vendor City, Vendor State, Vendor Zip Code
* Warehouse: Warehouse Key (PK), Warehouse Number (NK), Warehouse Name, Warehouse Address, Warehouse City, Warehouse State, Warehouse Zip Code, Warehouse Total Square Footage
* Product: Product Key (PK), Product Description
* Date: Date Key (PK), Calendar Date YYYY-MM-DD, Day of the Week, Quarter, Season, Holiday, Weekend
* Employee: Employee Key (PK), Employee Name, Employee Address 1, Employee Address 2, Employee State, Employee City, Employee Zip Code
* Carrier: Carrier ID (PK), Carrier Name, Carrier Address 1, Carrier Address 2, Carrier State, Carrier City, Carrier Zip Code
* Contract Terms: Contract ID, Contract Descript, Contract Term Type

## Step 4: Identify the Facts

* Purchase Requisitions – One row per requisition line
  + Purchase Requisition Date Key (FK), Product Key (FK), Vendor Key (FK), Contract Terms Key (FK), Requested By Employee Key (FK), Contract Number, Purchase Requisition Number, Purchase Requisition Quantity, Purchase Requisition Dollar Amount
* Purchase Orders – One row per purchase order line
  + Purchase Order Date Key (FK), Product Key (FK), Vendor Key (FK), Contract Terms Key (FK), Warehouse Key (FK), Employee Ordered By Key (FK), Employee Purchase Agent Key (FK), Contract Number, Purchase Requisition Number, Purchase Order Number, Purchase Order Quantity, Purchase Order Dollar Amount
* Shipping Notifications – One row per shipping notice line
  + Shipping Notification Date Key (FK), Estimated Arrival Date Key (FK), Product Key (FK), Vendor Key (FK), Warehouse Key (FK), Carrier Key (FK), Purchase Order Number, Shipping Notification Number, Shipped Quantity
* Warehouse Receipts – One row per receipt line
  + Warehouse Receipt Date Key (FK), Product Key (FK), Vendor Key (FK), Carrier Key (FK), Employee Received By Key (FK), Purchase Order Number, Shipping Notification Number, Warehouse Receipt Number, Received Quantity
* Vendor Invoices – One row per invoice line
  + Vendor Invoice Date Key (FK), Product Key (FK), Vendor Key (FK), Contract Key (FK), Employee Purchasing Agent (FK), Purchase Order Number (FK), Warehouse Key (FK), Invoiced Quantity, Invoice Amount, Invoice Discount Amount, Invoice Dollar Amount, Net Invoice Amount
* Vendor Payments – One row per payment line
  + Vendor Payment Date (FK), Product Key (FK), Vendor Key (FK), Warehouse Key (FK), Contract Terms Key(FK), Contract Number, Vendor Invoice Key, Payment check Number, Payment Amount

# Summary

As you can see from above, each stage of the procurement process is broken out into separate fact tables. Since the whole procurement process has many steps and is treated as separate business rules, dividing the information into logical pieces is the best way to go in implementing it into the data warehouse. This allows AllStar Grocery to capture all the necessary information without overloading a single fact table. For instance, many columns in the proposed divided fact tables, contain a column that refers to the dimension table Employees. In several steps, we need to know who authorized a purchase order or signed off on the receipt of a shipment to a data warehouse. If we only labeled a column Employee to represent an employee in any given step of the procurement process, then it would be easy to misunderstand what the instance of data really means with an ambiguous column name. In contrast, if we had 5 specifically named Employee columns in addition to all the other bits and pieces of the procurement process, the fact table would quickly grow and be harder to maintain and update as items move along in the procurement process.

While it may seem like separating each piece of the procurement process into separate fact tables may be tough to reach the companies analytical goals such as are we optimizing our spending on procurement by limiting the number of suppliers we have or are our suppliers delivering the quantity of items we requested in a timely manner, etc all elements of the procurement table are present and can be combined through the use of dimension tables. AllStar Grocery can now create a snapshot of the details of the procurement process starting with the procurement requisition all the way to the payment invoice each day, week, or month!