

CIS 409
Data Warehousing and Dimensional Modeling
Fall A 2024

Assignment #1 – 30 Points

See Canvas and/or course schedule for due date/time

Submission Format

Your choice: for example, a Microsoft Word document with your diagrams prepared in PowerPoint or a similar drawing program. If you use anything other than PowerPoint (Visio, draw.io, etc.), save your file as a PDF and upload your PDF. If you use PowerPoint, you may submit either a “native” PPTX file or convert to PDF to upload; your choice there.

YOU ARE NOT PERMITTED TO HAND-DRAW YOUR DIAGRAMS AND SUBMIT A HAND-DRAWN SCANNED DOCUMENT – IF YOU DO, YOU WILL RECEIVE A ZERO FOR THIS ASSIGNMENT. YOU MUST USE POWERPOINT, VISIO, DRAW.IO, OR A SIMILAR ONLINE DRAWING TOOL AND THEN SUBMIT EITHER A PPTX OR PDF FILE.

Situation:

You work for a retail company that has stores and operations across the U.S. Currently your company has no data warehouses, data marts, operational data stores, or any other integrated stores of data used for reporting, BI, and analytics. Your company also has an Internet presence with a website from which customers can purchase products.

For purposes of this assignment, you are interested in the following seven systems:

1. **Supply Chain Operations, Eastern U.S. Region** – this system manages all supply chain functions for the company’s Eastern U.S. Region. The functions managed by this system include materials and inventory management; vendor management; materials ordering and defective material return; shipping and logistics; warehouse management; etc.
2. **Supply Chain Operations, Western U.S. Region** – this system is identical to (but separate from – i.e., it’s a different piece of software) the Supply Chain/Eastern U.S. Region system described above, except that it performs the supply chain functions for all of the Western U.S. Region.

3. **Accounting and Finance System, Western U.S. Region** – this system runs all accounting and financial operations for the Western U.S. Region.
4. **Accounting and Finance System, Eastern U.S. Region** – this system is identical to the one described above, except that it runs all financial operations for the Eastern U.S. Region.
5. **In-Store Sales System, Western U.S. Region** – Each of the company's stores has a point-of-sale (POS) system that handles all product purchases, payments, returns, and refunds. All of the stores in the company's Western U.S. Region feed data daily from each POS system to a centralized In-Store Sales System for the entire Western U.S. Region, which summarizes all sales within the Western U.S. Region and also maintains a history of past sales as well.
6. **In-Store Sales System, Eastern U.S. Region** – This system is identical to the one described above, except that it consolidates and organizes sales data from all of our stores in the Eastern U.S. Region.
7. **Online Sales System, Eastern U.S. **AND** Western U.S. Regions (combined)** – This system handles all Internet sales for all customers regardless of where they live in the U.S., and is a separate sales system than either of the in-store sales systems described above. (For purposes of this assignment, assume that only residents in the U.S. – e.g., not in Europe, Asia, or Australia – can purchase products online.)

Question #1 (10 Points)

For the scenario described above, draw the high-level architecture for a **fully centralized enterprise data warehouse (EDW)** to support the analytical needs of the entire company. (*Helpful hint: make sure that you fully understand what "centralized EDW" means and what one looks like!*)

Grading Rubric:

Grading Criteria	Points for Full Credit
Correct source systems	4
Correct ETL lines	2
Correct data warehousing environment structure	4

Question #2 (20 points)

Now presume that your company's Chief Information Officer (CIO) is a strong believer in smaller-scale efforts rather than large, enterprise-intensive ones such as CIF or the Dimensional Data Warehouse Bus Architecture. The CIO directs you to define the architecture for a **Front End Data Mart** approach, with the front-end marts set up by geographical region. (Another helpful hint: make sure you fully understand what the "front end data mart" architecture means and what one looks like...all of it, the entire end-to-end architecture!)

Draw the complete high-level architecture for this company's front-end data marts. Make sure you clearly show your data flows from each source component to each target component. You must show **each source system individually on your diagram**, the same as with your diagram for Question 1.

Grading Rubric:

Grading Criteria	Points for Full Credit
Correct source systems shown on diagram (<u>each one shown individually</u>)	7
Correct overall architecture including all components, ETL flows, etc.)	13