IS 623 Information Systems Design & Development

Project Name: Collaborative Supply Chain Platform for Dollar Tree

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1. Introduction

1.1 Project Overview

Dollar Tree, a large discount retail company, is dealing with significant challenges in its supply chain. Problems like poor communication, a lack of transparency, and a lack of real-time information are causing operational inefficiencies, resulting in stockouts, frustrated customers, and financial losses. To tackle these issues, we propose a comprehensive solution: the Collaborative Supply Chain Platform for Dollar Tree. This project aims to improve and streamline Dollar Tree's supply chain processes, leveraging advanced technologies and collaboration tools, from sourcing products to distributing them across Dollar Tree stores.

1.2 Project Objective

The main goal of this project is to create a secure, cloud-based platform that facilitates transparent communication, proactive issue resolution, and real-time order tracking between Dollar Tree and its suppliers. The platform intends to:

- Break down communication barriers by enabling instant information sharing on orders, production progress, potential delays, and other critical updates.
- Proactively address problems by identifying and resolving issues early, minimizing disruptions, and preventing stockouts.
- Provide real-time visibility into order progress from placement to delivery, ensuring transparency and accountability throughout the supply chain.
- Strengthen relationships with suppliers through improved communication and collaborative problem-solving, facilitated by an administrator's functionality to manage suppliers.
- Optimize inventory management by reducing stockouts and improving planning through real-time data and visual statistics.
- Increase efficiency and profitability by streamlining operations, minimizing delays, and ultimately boosting Dollar Tree's financial performance.

1.3 Project Scope

This project aims to supply Dollar Tree's chain with a secure, cloud-based platform directly connecting them with suppliers. The platform will provide real-time tracking, proactive issue management, and built-in communication tools for smooth operations. User-friendly interfaces and comprehensive reports will help facilitate informed decision-making. The platform's design is set to transform Dollar Tree's supply chain, resulting in increased efficiency, reduced costs, and ultimately, satisfied customers.
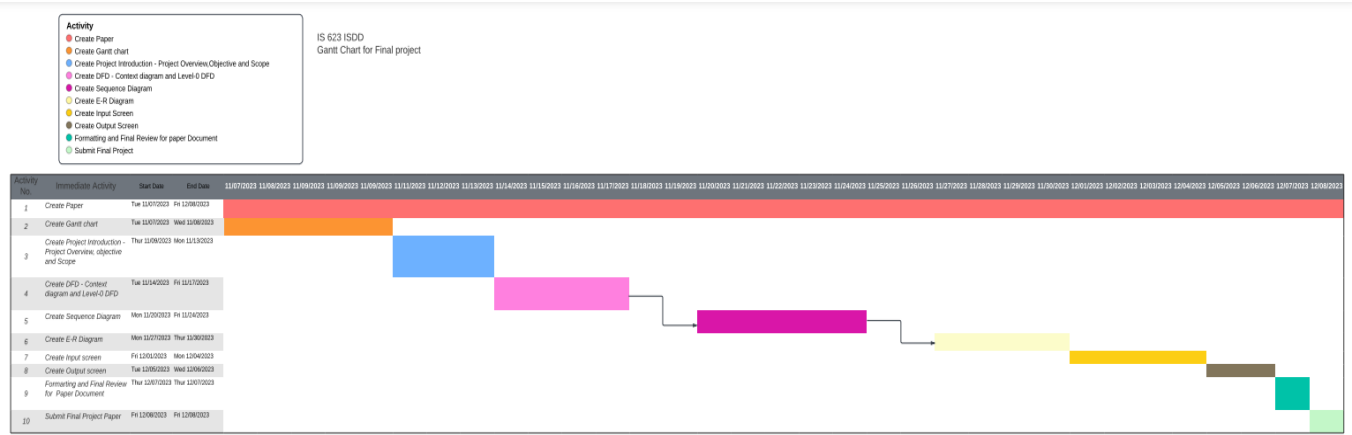
2. Gantt Chart

Figure 2.1 : Gantt Chart

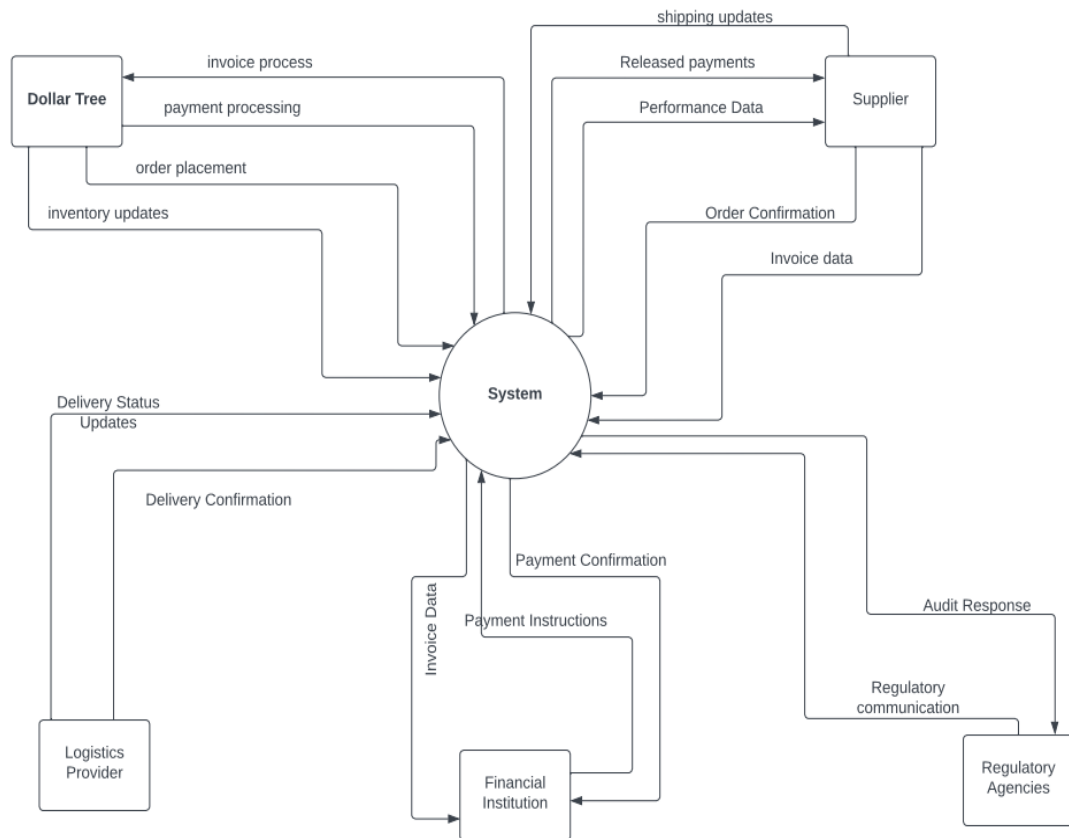# 3. DFD – Data Flow Diagram

3.1 Context – Level Diagram

Figure 3.1: Context Level Diagram for Supply Chain Platform for Dollar Tree

The description of the external entities and their interactions with the collaborative supply chain platform:

- **Dollar Tree:** Places orders with suppliers, track shipments, and makes payments to suppliers.
- **Suppliers:** Receive orders from Dollar Tree, provide production updates and shipping notifications, and send invoices to Dollar Tree.
- **Logistics Providers:** Deliver shipments from suppliers to Dollar Tree stores.
- **Financial Institutions:** Process payments from Dollar Tree to suppliers.

- **Regulatory Agencies:** Receive regulatory compliance reports from Dollar Tree and send audit requests to Dollar Tree.
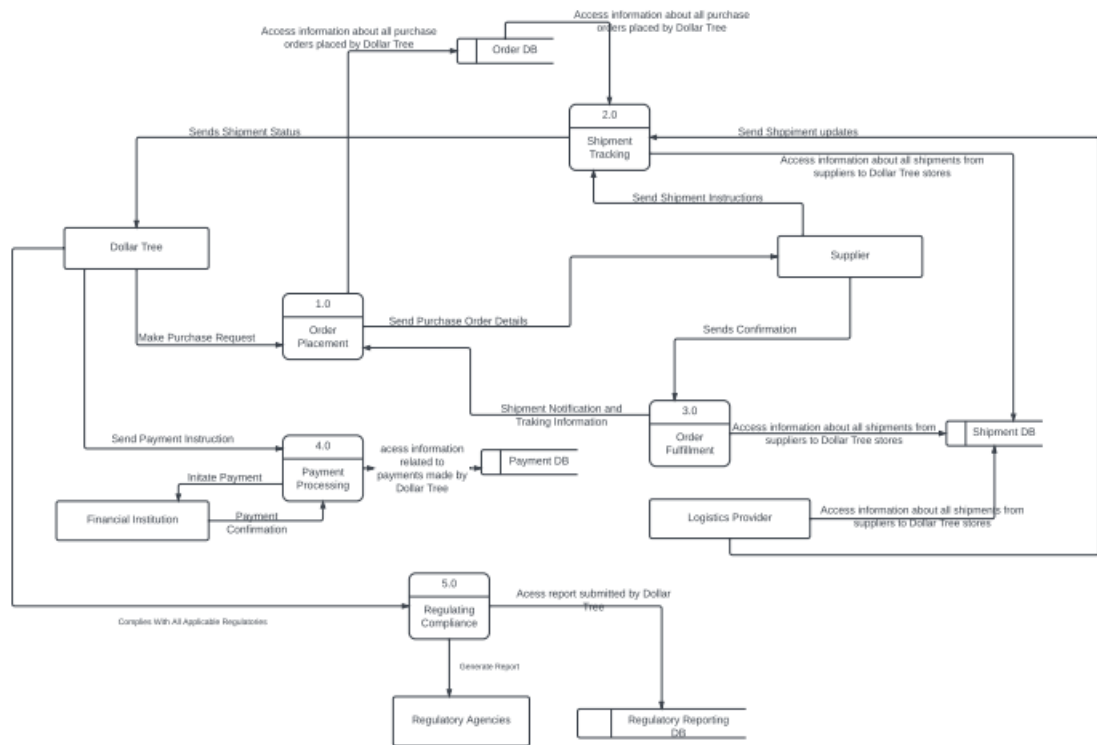
3.2 Level 0 Data Flow Diagram

Figure 3.2 Level 0 DFD for Supply Chain Platform for Dollar Tree

Entities:

- **Dollar Tree** is a discount retail company that places orders with suppliers and distributes products to its stores.
- **Suppliers**: companies that manufacture and deliver products to Dollar Tree based on purchase orders.
- **Logistics Providers**: Companies that transport goods from suppliers to Dollar Tree stores.
- **Financial Institutions:** banks and other financial institutions process payments from Dollar Tree to suppliers.

- **Regulatory Agencies**: government agencies that regulate the retail industry.

Processes:

- **Order Placement**: Dollar Tree places purchase orders with suppliers, specifying the products, quantities, and delivery dates.
- **Order Fulfillment**: Suppliers fulfill orders by manufacturing and delivering products to Dollar Tree stores.
- **Shipment Tracking**: Dollar Tree tracks the movement of shipments from suppliers to its stores.
- **Payment Processing**: Dollar Tree processes payments to suppliers for fulfilled orders.
- **Regulatory Compliance**: Dollar Tree complies with all applicable regulations the retail industry should follow.

Data Stores:

- **Order Database**: Stores information about all purchase orders placed by Dollar Tree, including product details, quantities, delivery dates, and order status.
- **Shipment Database:** Stores information about all shipments from suppliers to Dollar Tree stores, including tracking numbers, estimated delivery dates, and actual delivery dates.
- **Payment Database:** Stores information about all payments made by Dollar Tree to suppliers, including payment amounts, payment dates, and payment status.
- **Regulatory Reporting Database:** This database stores information regarding all regulatory reports that Dollar Tree has filed with government organizations.
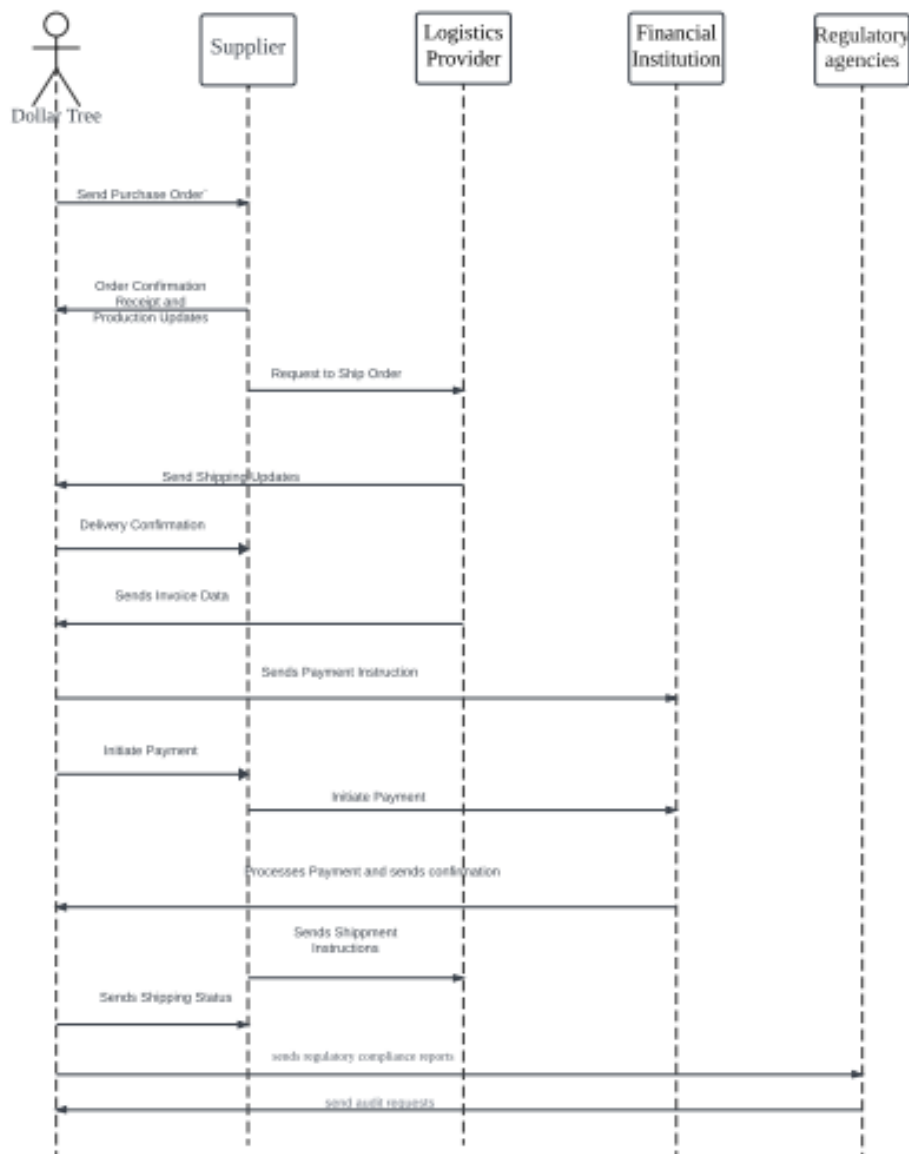
4. Sequence Diagram

Figure 4.1 : Sequence Diagram for Supply Chain Platform for Dollar Tree

The interaction in the diagram is as follows:

- Dollar Tree sends purchase orders to suppliers.

- Suppliers send production updates and shipping notifications to Dollar Tree.

- Logistics providers deliver shipments from suppliers to Dollar Tree stores.

- Dollar Tree sends invoices to suppliers and payment instructions to financial institutions.

- Financial institutions process payments to suppliers.

- Dollar Tree sends regulatory compliance reports to regulatory agencies.

- Regulatory agencies send audit requests to Dollar Tree.

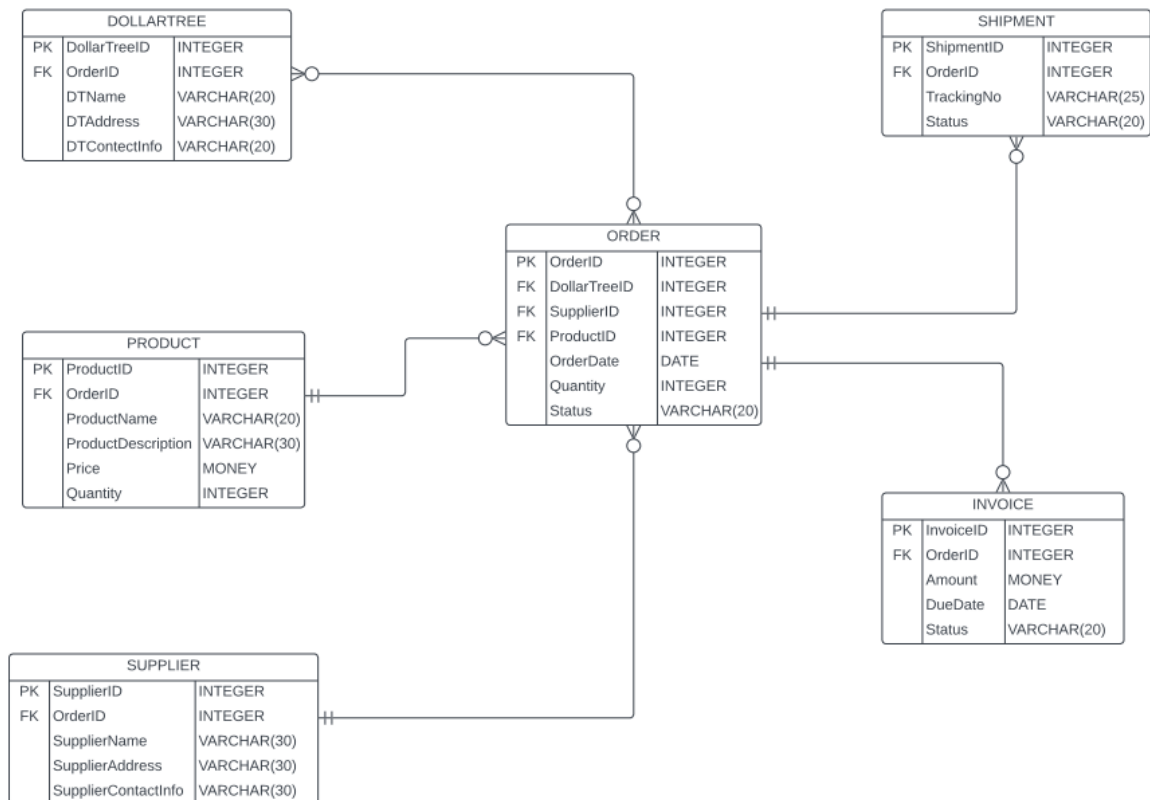## 5. Entity – Relationship Diagram

Figure 5.1 ER Diagram for Supply Chain Platform for Dollar Tree

This entity-relationship diagram (ERD) represents the logical structure of the database for the Collaborative Supply Chain Platform for Dollar Tree. It consists of entities used to build the system and their relationships to each other.

The key entities in the ERD are:

- **Dollar Tree:** A large discount retail company that places orders with suppliers and distributes products to its stores.
- **Supplier:** A company that manufactures and delivers products to Dollar Tree based on purchase orders.
- **Product:** The product that Dollar Tree offers for sale.
- **Order:** A purchase order placed by Dollar Tree with a supplier.

- **Shipment:** The delivery of goods from a supplier to Dollar Tree.

- **Invoice:** A document that shows the amount owed and the details about the goods and services provided by Dollar Tree.

The relationships between the entities are as follows:

- A Dollar Tree can place multiple orders with a supplier.

- A supplier can fulfill multiple orders for a Dollar Tree.

- A supplier can sell multiple products to a Dollar Tree.

- A product can be included in multiple orders.

- An order can include multiple products.

- An order can only have one shipment.

- An invoice is associated with a single order.

6. Input Screen

Figure 6.1: Input Screen for Supply Chain Platform for Dollar Tree

7. Output Screen

Figure 7.1: Output Screen for Supply Chain Platform for Dollar Tree

8. Conclusion

The collaborative supply chain platform adopted by Dollar Tree is a promising initiative that can substantially enhance the company's supply chain operations. By automating tasks, streamlining communication, and providing real-time visibility into the entire supply chain, the platform can help Dollar Tree reduce costs, improve efficiency, and increase customer satisfaction.

The platform's ability to connect Dollar Tree securely and transparently with its suppliers, logistics providers, and financial institutions will foster closer collaboration and build stronger relationships. This collaboration will lead to more efficient order fulfillment, better inventory management, and a more competitive position for Dollar Tree in the retail market.

The collaborative supply chain platform offers many potential benefits for Dollar Tree, however, its implementation will need detailed planning and execution. By investing in this innovative platform, Dollar Tree can position itself for long-term success in a competitive and ever-evolving retail landscape.