Phase I Report

Fashion is the imitation of a given example and satisfies the demand for social adaptation···The more an article becomes subject to rapid changes of fashion, the greater the demand for cheap products of its kind'

 -Georg Simmel, Fashion (1904)

Every few decades, an industry faces a disruptive business model that leaves all the other major players high and dry. The apparel retail industry is in the middle of one such transition with the hugely successful Spanish fast fashion brand Zara as the trail blazer.

The trigger: understanding the evolving consumer

Over the last five years, the apparel retail industry has seen a marked change in the preferences of its customer base. With the advent of globalization, the average consumer has become more aware of fashion trends around the world. Clothes are no longer looked at as a utility to cover one's body, rather, they are viewed as a medium to express one's personality. This in turn has led to two marked changes in the consumer expectation from the fashion retail industry:

(A) **More variety and up to date items (fast fashion)**: The average customer at a retail store today expects to see new designs that capture current fashion trends on an endless aisle of product.
(B) **Disposable fashion**: Since the average customer updates her wardrobe every few weeks, quality is no longer the main criteria while purchasing an item. Cheap and trendy are the buzzwords.

The As-Is: what does the traditional apparel retail supply chain look like?

The process is broadly divided into the following functions:

1) **Product Organization and Design**
   Data collection and trend prediction for the upcoming fashion seasons is performed. This work is outsourced to a trend prediction agency. Traditionally, the apparel manufacturers work with a process where the production for the clothes to be displayed on the shelves a year later is started well in advance. This means that to come up with a collection for fall 2017, the work will begin immediately (fall 2016).
2) **Procurement**
   The procurement process was purely operational. Focus was on keeping the process error free and efficient by minimizing inventory investment and cost of operational activities. Due to long lead times, procurement of fabric was initiated at least six months in advance.

3) **Production**
   Production was outsourced to overseas apparel production houses in countries like China and Vietnam to take advantage of low labor rates. The strategy was to place orders in bulk and minimize per item net cost.

4) **Product distribution**

The decisions for distribution of product to various store chains were taken at the headquarters, ideally by the top management along with the market specialist team. The store managers or sales personnel at the end of the chain had no say in this decision.

5) **Sales and feedback**

The store manager was responsible for sending monthly sales reports to the headquarters. Compensation of the sales and store managers was fixed regardless of the sales each month.

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The problems:

- Not agile enough:

This retail chain was not 'agile' enough to respond to the rapidly evolving customer tastes. The entire business process needed at least 6 months to respond to a customer demand or fashion trend. In other words, converting a current event to a possible business was virtually impossible. For ex. If a recently movie turns into a blockbuster, customized T-shirts with the characters for that movie sell very well in the next few weeks.

Lack of company's product on the shelf, turns the customer to competitor's product and around 20% never come back. In other words, short delivery times can increase market share (Bititci, 2010)

- Excessive reliance on prediction very early in the cycle

The entire clothes collection relied heavily on prediction several months in advance which carried significant risk.   A slight change in weather predictions, inaccurate trend forecasting could spell heavy losses for the highly competitive apparel retail industry.

- Not customer oriented: Customer and business operating at different 'paces'

The current process was misaligned with the customer's need. With a dynamic customer wanting to update her wardrobe quickly to align with trends, the only motivation for a returning customer will be a new collection on racks every 2-3 weeks. A 6-month long cycle was simply not capable of addressing this need.

The solution: "Agile supply chain" + Customer Orientation + Data

We propose that the company make drastic changes to its retail value chain infrastructure as well as it's organizational structure to align with the current customer needs and business environment.

Strategy:

1. Produce more kinds of product in lesser quantities.

Most clothing retailers produce around 2,000 to 4,000 different articles of clothing on an average. We suggest that the production this number be increased to 10,000 different articles, keeping the quantities limited to create an impression of exclusivity and scarcity.

2. Produce where you sell leading to shorter lead times

Own most the apparel production houses outsource only the basic line, keep control of the rapidly changing line. This will push up the costs of production, however this will be compensated as most of the rapid line will be sold at full price.

We propose two lines of clothing:
Basic line (traditional line, clothing like socks, stockings, white shirts, classic formal attire): Produced in outsourced apparel production houses and follows the traditional retail chain. Accounts for 80% of the stock.

Rapid line (trendy current fashion, fast changing: for ex trendy jackets that showed up on New York fashion week 2 weeks ago): Produced in in house apparel production houses and follows the agile supply chain. Accounts for 20% of the stock.

How? By utilizing the three pillars below:

- Agile supply chain:
  The design prediction and a part of the apparel production are moved in house to get everyone including the management in one place. This will significantly decrease lead times to delivery for the rapid line of clothing.

- Data
  Data in stores: Gathering information by utilizing internal interfaces for data like sales, staff, leftovers analysis, complaints.
  Real time data from around the world. collection of data from real world, real time – like fashion flash points, streets, clubs, bars. Recent fashion week.

- Customer orientation:
  Using an agile supply chain enabled by the right data and technology infrastructure will help the company to respond to customer needs accurately.
  Integrate the lower end of the process cycle, namely sales personnel and store manager in the decision-making process by incentivizing them for better sales.
  To-be Swimlane transformed.vsdx

Advantages of the model:

- Agility and flexibility: (Good responsiveness to external factors like weather and margin maximization)
- Accurate forecasting
- Lower markdowns
- Quickly pick up current fashion trends
- Update collection quickly which keeps customers coming back
- Higher profitability (gross margins)

Phase II Report

Description:

Clothing trends are captured in the table **Clothing Trends**. Each clothing trend like (frills, denim, sparkle etc.) has a unique Trend_ID along with a trend description and status. Clothing trends are associated with **Clothing_item** which represents an individual unique piece of clothing. Each clothing item is uniquely identified by an **SKU** (Stock keeping Unit). In addition, each clothing item has its own style, price, trend status, trend ID, store ID, customer ID and clothing line type. A clothing trend may zero or many clothing items associated with it. A clothing item can have only one clothing trend associated with it. A **customer** can buy many items, but at least need to buy one item to be recorded in the database while one **Clothing_item** can only have at most one customer. A **Shipment** is uniquely identified by a Shipment_ID and contains at least one clothing item. A clothing item can be contained in one and only one shipment. Each shipment is sent by one and only one supplier. A **Supplier** at any point of time could be associated with one or many shipments. It may be possible that a supplier has not sent any shipment yet. Each Shipment can be delivered to one and only one **Store** at a time. A store can have more than one shipment but must have at least one shipment. Each Store can have one or more **store_employees**. Number of store employees cannot be zero. A **Store_Employee** has a unique Employee_ID and is managed by one and only one store employee who is the store manager.

Below is the detailed list of attributes and table names:

Table Name : CUSTOMER_TRENDS			
Attributes	*Description*	*Data type*	*Constraints*
Trend_ID	Unique Sequence Number for each trend in market(e.g. 1-Frills,2-Glitter)	number	Primary Key
Trend_Description	Description of the trend i.e Frills,Glitter etc)	varchar(50)	
Status	Y'or 'N' which is decided if the trend_id is analysed to be be in current trend or not.By Default it is NULL	char(10)	Not Null
Table Name : CLOTHING_ITEM			
Attributes	*Description*	*Data type*	*Constraints*
SKU(Stock Keeping Unit)	Unique Sequence Number for each item	number	Primary Key
SKU Description	Description of the Item	varchar(50)	

Price	Price of the Item	Float(30)	
Trend_ID	Unique Sequence Number for each trend in market(e.g. 1-Frills,2-Glitter)	number	Foreign Key
Store_ID	Unique number for each store	number	Foreign Key
Customer_ID	Unique number given to each customer on purchase	number	Foreign Key
Clothing_Line_Type	Based on the trend_id,setting the field to 'R'(Rapid line) or 'B'(Basic line)	char(10)	Not Null

Table Name : STORE

Attributes	Description	Data type	Constraints
Store_ID	Unique number for each store	number	Primary Key
Location	Location of each store	number	Not Null
Manager_ID	Manager_ID for each store	number (Not Null)	Not Null

Table Name: CUSTOMER

Attributes	Description	Data type	Constraints
Customer_ID	Unique number for each customer	number	Primary Key
Contact_No	Contact Number for each customer	number	
Membership_No	Membership Number for each customer	number	

Table Name : STORE_EMPLOYEE

Attributes	Description	Data type	Constraints
Employee_ID	Unique number for each customer	number	Primary Key
Store_ID	Unique number for each store	number	Foreign Key
Contact_No	Contact Number for each customer	number	

Department_Name	Department Name for each employee i.e.Cashier,Men's Section,Women's Section etc	varchar(50)	Not Null
Manager_ID	Unique number for each customer	number	Foreign Key

Table Name : SHIPMENT

Attributes	Description	Data type	Constraints
SKU(Stock Keeping Unit)	Unique Sequence Number for each item	number	Primary Key & Foreign Key to Clothing_Item
Supplier_ID	Unique number for each supplier	number	Primary Key & Foreign Key to Supplier
Source_Location	Source location description of the	varchar(50)	Not Null
Destination_Store_ID	Destination Store Location number	number (Not Null)	Not Null

Table Name : SUPPLIER

Attributes	Description	Data type	Constraints
Supplier_ID	Unique number for each supplier	number	Primary Key
Supplier_Name	Source location description of the	varchar(50)	Not Null
Address	Address of the supplier	varchar(50)	
Contact_No	Contact Number for each supplier	number	

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CUSTOMER_TRENDS

Trend_ID	Trend Discription	Status

CLOTHING_ITEM

SKU	SKU Description	Price	Trend_ID	Store_ID	Customer_ID	Clothing_Line_Type

STORE

Store_ID	Location	Manager_ID

CUSTOMER

Customer_ID	Contact_Number	Membership_Number

STORE_EMPLOYEE

Employee_ID	Store_ID	Contact_Number	Department_Name	Manager_ID

SHIPMENT

SKU	Supplier_ID	Source_Location	Destination_Store_ID

SUPPLIER

Supplier_ID	Supplier_Name	Address	Contact_Number

Phase III Report

As we cannot find the suitable database, we have made up one according to the description in the former reports. And here is what we code depended on the different chapters.

Chapter 1:

Description: *List the inventory available at any given time.*
select sku,sku_desc from clothing_item;

Description: *Determine markdown price of items during the sale season.*
SELECT sku "Item_no" , price*0.8 "Markdown Pice"
FROM   clothing_item;

Chapter2

Description: *The higher officails in the company directly want to talk to the employees in Sales dept who dont have the managers supervising them and ask about their feedback whether they are willing to work under a manager or not.*
select * from store_employee where department_name = 'Sales' and manager_id is null;

Description: *To regulate the prices during the anniversary event of ZARA the finance team wants to know the items which are selling at a low price.*
SELECT sku,sku_desc,price
FROM   clothing_item
WHERE   price <= 30;

Description: *Store manager wants to know if a particular clothing item belongs to the rapid or basic line. He has the SKU information at hand.*
Select clothing_line_type from Clothing_item where SKU=&SKU;

Chapter 3

Description: *Due to some issues in shipping from London to the stores the company want to know the suppliers which registered in that location.*
select * from supplier where upper(address) like ('%LONDON%');

Description: *To give bonus to employees the company wants to know the employee who are currently working with the company and are hired on or after 1-Jan-2005.*
SELECT employee_id, hire_date
FROM   store_employee
WHERE   hire_date > ='01-Jan-05';

Chapter 4

Description: *The display of date has to be in a much more user friendly manner.*
SELECT last_name,
        TO_CHAR(hire_date, 'fmDD Month YYYY')
        AS HIREDATE
FROM   employees;

Description: *Sometimes the prices of items which are entered on the time of item set up is set up as null by mistake.This creates a problem while analysing sales information.Before going ahead with such values it is better to show all such NULL values to 0.*
SELECT sku,sku_desc, NVL(price,0) as price FROM clothing_item;

Chapter 5

Description: *Management wants to know the range of tenure of the employees working for the firm. Find the min and max hire_date*
SELECT round(MIN((sysdate - hire_date)/365)) || ' year(s)' "Min tenure", round(MAX((sysdate - hire_date)/365))|| ' years' "Max Tenure"
FROM store_employee;

Description: *Identify how many items are being sent from USA.*
select count(sku) as "ITEM_COUNT",supplier_id,source_location from shipment group by supplier_id,source_location
having upper(source_location) like ('%USA%');

Description: *The company wants to know how many stores has a particular supplier supplied to.*
SELECT COUNT(DISTINCT destination_store_id) "Count of stores"
FROM   shipment where supplier_id = &supplier_id;

Chapter 6

Description: *Higher management wants to know more about the trends (trend description) decided by the design team.*
select   ci.sku,ci.sku_desc,ci.trend_id,ct.trend_description from clothing_item ci
join customer_trends ct on (ct.trend_id = ci.trend_id) where ci.trend_id in (8,9,11);

Chapter 7

Description: *the company wants to track down all stores and items selling items made from a the supplier 'Utah Fashion Ltd' as there are some defects in the material from the supplier. Since at ZARA we are striving for customer satisfcation we are asking the affected stores to stop selling the items.*
select sku,store_id from clothing_item where store_id in (select destination_store_id from shipment where supplier_id=

(select supplier_id from supplier where supplier_name = 'Utah Fashion Ltd'));

Chapter 8

Description: *The management wants to know which trends are not in fashion as per the design team and thus have no orders placed in the current rapid line inverntory.*
select trend_id from customer_trends
minus
select trend_id from customer_trends where status = 'Y';

Description: *The management wants to know which all stores from the stores table the records exist in the shipment table.*
select store_id from STORE
intersect
select destination_store_id from shipment;

Chapter 9

Description: *The business analyst have come across a new trend in fashion and wants the same to inserted into the database.*
insert into customer_trends values (21,'Running/Jogging','N');
commit;

Description: *there were some issue with scan guns and so the prices of few items were scanned to null,the nvl statement was used to only display a value of 0.However on rescanning the item the correct price of the item is available.The same needs to be updated in the database.*
update clothing_item set price = 45.56 where sku = 90006;
commit;

Chapter 10

Description: *since the clothing_item table is a table which will contain millions of records.A process is followed every month in which all the data is stored to a history table.The table clothing_item table is then truncated and refreshed for new entries. Create a history table for the first time and copy the contents from the main clothing_item table into it.*
create table Clothing_history as (select * from clothing_item);

Description: *Empty the contents of the clothing_item table.*
trunc table clothing_item;

Description: *Query to append values into the clothing_history table in the second,third,fourth etc iteration*
insert into clothing_history.
select * from clothing_item;

Chapter 11

Description: *Business analyst has requested for data of all the suppliers residing in USA to perform further analysis to create a view for supplier which is supplying the most items (assuming it is 60001).*
create or replace view sup_USA as
(select supplier_id,supplier_name,address,contact_no from supplier
where Address like "%USA%");
commit;

Description: *read only access is provided for security purpose.*
create or replace view supp_4 (item_no,supplier_id,Supplier_location,
shipment_store)   as select sku,supplier_id,source_location
,destination_store_id from shipment
with read only;

Description: *drop a view after the work is done.*
drop view sup_USA;

Description: *To create a sequence of trend_id which reduces the chances of error in a large database(Avoiding the manual entry for the entry to the primary key and avoiding the skipping of values).*
CREATE SEQUENCE trend_id_seq
                INCREMENT BY 1
                START WITH 22
                MAXVALUE 9999
                NOCACHE
                NOCYCLE;

Chapter 12

Description: *For customers who are senior citizens the company is starting a program to give bonuses/discounts to customers. To implement this the company is adding a column of date of birth in the customers table from now on. This is effective from the next purchase at the store and not valid for customers who bought the items previously.*
ALTER TABLE customer
ADD date_of_birth date;

Description: *the supplier_name is usually a long field and in future the entry of the name should not be restricted to the length of the characters it can hold so we alter the column width.*
ALTER TABLE supplier
MODIFY supplier_name varchar2(100);