

Transportation Analytics using Power BI: Case study on Welspun Global Brands Limited

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ABSTRACT

Business intelligence and analytics are now a days becoming very essential for any company to get insights of their day to day operations. Consider a situation where one company has to supply their products at retail store level all over India while taking care of timely delivery as well cost of transportation. Also the company needs to work with various transportation providers to cater this demands. This case is about Welspun Global Brands Limited (WGBL) which faced the problem of how to measure the performance of the transporter as well to determine the logistic cost for each variety of product; which could be used for tracking & improving supply chain performance.

Keywords

Logistics, Transportation, Power BI, cost to serve, Decision Making, Analysis

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Introduction

Welspun started his journey in 1985 as Welspun Winlon Skill Mills Pvt Ltd. at Mumbai. The main objective then was to manufacture polyester filament yarn & texture yarn. In 1986 it established the yarn texturing unit at Palghar (Thane) and in Silvassa, Gujarat in 1988. In 1993 company undertook the manufacturing of a terry towel in Vapi, Gujarat with a capacity of 15000 spindles. The company was later renamed to Welspun India Ltd (WIL) – now a part of the Welspun group since it ventured into a business like Line pipes, Home Textile, Infrastructure, Steel, Advance textile, and Flooring Solutions. Welspun Group now consists of five group companies. (Welspun Group, 2020)

Welspun India (Home textiles)

Welspun Corp (Pipe & Plates)

Welspun Enterprises (Infrastructure & Energy)

Welspun Steel (DRI & Billets)

Welspun One (Logistics parks)

Welspun India Ltd is one of the top 4 Terry Towel producers in the World. It's also the Asia's largest Textile firm. Their business network is spread across 32 countries. 94% of their total products are exported to countries like Australia, US, UK, Italy, Sweden, Canada & France.

WIL is world's largest home textile manufacturer as it enjoys 5 percent of the United States total home textiles market which accounts for one-third

of its total group revenue from the textiles business.

The Welspun India offers a variety of products like towels, bed linen, basic bedding, decorative bedding, rugs, and bathrobe in different qualities and sizes. They have additionally Launched natural products using the advantages of Soya, Seaweed, milk, and Bamboo. It has two manufacturing facilities at Vapi and Anjar in Gujarat.

During 2011-12 Welspun Global Brands Limited (WGBL) was merged into Welspun India (WIL) by taking various steps to consolidate their manufacturing. The reason behind this step was to ensure that customers are provided with quality & superior products.

Both manufacturing and marketing business were consolidated under WIL after this merger, hence creating a one single textile business, while in order to retain its marketing identity Welspun Retail was renamed as Welspun Global Brands. (PTI, ZeeNews, 2012)

In 2016, WIL faced a major setback when after an extensive investigation, Target Corporation proved that Welspun used Non Egyptian cotton to manufacture bedsheets and pillowcases sold by the retailer (Walmart), instead of using of Egyptian cotton for manufacturing these sheets between August 2014 and July 2016. WIL then hired one of the big four consultancies firm to look into this matter. This whole incident was proved to be unintentional from Welspun point of view. Target Corp gave approximately USD 90

million of sales in 2015-16 to Welspun India and contributed to almost 10 percent of its overall business. WIL then hired one of the big four consultancies firm to look into this matter. The company lost sales by 9% in 2017-18 in comparison with 2016-17 and also lost its growth trajectory. (Layak, 2019) This shows how even one element of the supply chain can affect the profit margins to a great extent.

Out of the top 20 retailers in the world, WIL is preferred supplier to 14 retailers. It endeavours to reach market leader position in each segment of its product. The company aims to satisfy its customers by providing products which gives the highest value for the money along with the quality.

WIL driven by its differentiation strategy based on Branding, Innovation & Sustainability, is on the track to meet the changing consumer needs & preferences. WIL also aims to have strong focus on domestic market. In 2015 WIL also decided to enter into the e-commerce market with its new online platform Shopwelspun.In and had targeted revenue of USD 50 million. (PTI, Zee New India, 2015)

The company currently has over about 300 distributors & 200 shop-in-shops in offline retail and having growth of approximately 30 percent annually. Fulfilling these domestic customers all over the country while maintaining profits it's not an easy task. With the portfolio range of more than 10000 products, the WGBL found it difficult to correctly estimate the profit margin that each unit of product can generate which in turn affects the business decisions like to continue or discontinue the product. WGBL didn't have any model/analysis to track the transportation cost at the product level which affects the profit margin. But this can be made possible through Cost to Serve (CTS) analysis of the transportation process.

Welspun Global Brands Limited (WGBL) has warehousing facilities at Anjar, Vapi, and Bhiwandi. They also have private warehousing service providers like FM, Vegh, DTDC, etc. The domestic business of WGBL cater to the different business channels listed below:

- I. S & D
- II. SIS
- III. Institution
- IV. CSD
- V. Hotel

- VI. B2B
- VII. Private Label
- VIII. E-Commerce

WGBL supplies its products to more than 200 cities in India to cater to these channels. Their distribution networks consist of more than 25 transporters serving different regions of the country. They have divided the Indian geography into 6 Zones. WGBL has been provided with a rate card by the transporter where per kg rate has been fixed and there is no scope of bargaining. With an annual distribution logistic cost of approximately 89 Million only reducing the cost of delivery is not the only aim, but customer satisfaction in terms of only time delivery with shortest lead time is also the focus. Thus WGBL felt the need to measure the performance of their Transporters which would help them to identify the best suitable transporter for the particular region.

Management Information System:

A management information system (MIS) is a computer system consisting of hardware and software that serves as the backbone of an organization's operations. MIS aids in management decision-making process by gathering the data from multiple online systems, analysing the information, and then reporting the data.

In order to strategize ways to improve operations MIS correlates multiple data points. For example, it enables to compare transportation expenditures by product with profit margins to improve decision-making. But this type of analysis is possible only due to data compiled by MIS.

WGBL had established MIS system used for decision making and also for controlling, analyzing and visualization of the information in the organization. WGBL uses SAP for the maintaining the data base for all the transaction and inventory. The company also maintains the detailed data base of each delivery made by the transporter. But WGBL wanted to measure the real-time performance of each transporter which was not happening with current setup. The team at Welspun was continuously striving to build up a transportation control tower that gives them real time tracking and performance of each transporter.

Cost to Serve:

For the company to successfully fulfil this demands of different channels they need to make

their supply chain more efficient i.e. Cost to serve of the product should be as low as possible to increase the profit margins but at the same time satisfy the customer. To understand cost to serve in detail is one of the major challenges faced by business today in Supply Chain Management area. And very few businesses really understand it. It is necessary to identify low margin product failing to which can hamper your ability to **improve business profitability across the whole portfolio.** (O'Byrne, 2018)

Cost to serve can be undertaken at various of levels and can target:

1. Logistics costs
2. Distribution costs
3. Supply Chain cost
4. or specific areas like warehousing or transport

Cost to Serve (CTS) is the addition of different cost which chip off the profit margin like outbound transportation, promotional cost, marketing cost, storage, picking & packing, customer specific services, etc. Logistics (transportation) has always been the one of the complex process in the Supply chain with ample opportunity to improve and is also often biggest contributor to overall Cost to Serve. **Error! Bookmark not defined.**

The transportation cost depends upon two types of good:

1. Low volume high weight
2. High volume low weight

The costing of the shipment is done on the basis of volumetric weight or material weight whichever is higher for LTL (Less than Truck Load). But for FTL (Full Truck Load) charge is fixed for the one shipment similar to a vehicle taken on rent for transportation. As stated earlier there are different channels to be served but the

most crucial channel is those that include the LTL transportation of goods.

WGBL currently distributes transportation cost equally among the products. But this may not be the correct way to arrive at cost to serve for transportation process. This may also affect the profit margin calculation for each product and hence affect the business decision. Thus WGBL require some method to calculate transportation cost per product. WGBL works with various transportation service provider to cater the product demand by various retailers.

Distribution cost consists of 2 parts:

1. Fixed cost based on volumetric weight, source & destination city
2. Variable cost like non metro charges, detention charges, handling charges, demurrage charges etc.

WGBL needed to transport lower quantity of product to different parts of the country which leads to LTL. Lesser the quantity of product more is the cost associated with each unit of the product. This cost helps to determine the cost to serve of the product since transportation costs are often one of the big contributor to overall Cost to Serve. If you find out that an expensive transporter is being routinely used to deliver a product with low margin to a customer, then loss is guaranteed in near future. At WGBL most of the transportation cases where of mix product shipment i.e. towels, Bedsheets, cushions etc.; hence cost associated with each variety of product would be different. It was very crucial to find out cost to serve of each product type so as to gauge the gains out of it.

There are two methods:

- I. Based on the percentage weight contribution of the article in the shipment
- II. Based on the Value(cost) contribution of article in the shipment

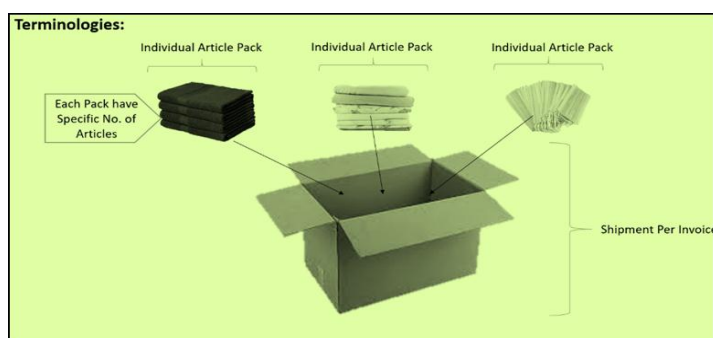


Figure 1 Terminologies

WGBL can use the method of percentage weight contribution as follows:

Step 1:

$$\% \text{ of total weight for Individual Article Pack}(\%W) = \frac{\text{Gross Weight of Individual Article Pack (kg)}}{\text{Grossweight of Shipment}(GW)(kg)} \times 100$$

Step 2:

$$\text{Freight for Individual Article Pack}(AP) = \frac{\% \text{ of total weight for Individual Article Pack}(\%W) \times \text{Total Freight of Shipment}(TF)}{100}$$

Step 3:

$$\text{Freight per Article} = \frac{\text{Freight for Individual Article Pack}(AP)}{\text{No of Articles (Per Pack)}}$$

There are number of destinations where it is required to make delivery of the product. WGBL has data base of more than 10,000 deliveries in a year for each shipment it will be merely impossible to calculate logistic cost for each unit of product at different levels would be difficult.

To make the visualization and evaluation available at fingertip power bi capabilities can be used. The basic steps involved in creating this evaluation dashboard are:

- 1) Getting data form MIS & Loading to Power BI
- 2) Power Query & DAX operations
- 3) Visualization using dash board

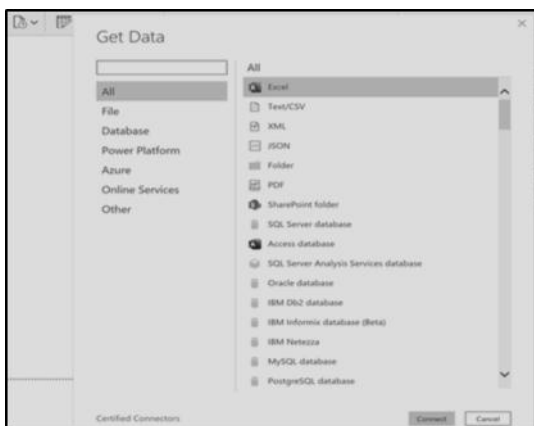


Figure 2 Getting data from MIS & loading to Power BI

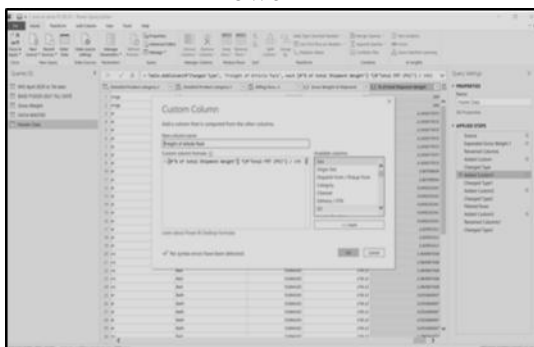


Figure 3 Power Query & DAX operations



Figure 4 Power BI Dashboard for visualization

Distribution Logistics:

Distribution logistics is related to the delivery of manufactured goods to the customer quickly and reliably. Distribution logistics (also known as transport logistics or sales logistics) is the link between manufacturing and the market place. Distribution logistics consists of all processes involved in the distribution of products or goods - from production to customers. Customers are either final customers, distributors or can be processors. Distribution logistics includes goods/material handling, transportation and intermediate storage. Sustainably structured information, decision-making and control processes are essential for implementing successful transport logistics. (Hofmann & Knell, 2019)

Distribution logistics in general needs to pursue three goals

1. Availability: Making sure that product is available for sales
2. Cost minimization: Reducing the transportation cost
3. Influence: Positively influence customer by on time delivery at right place in right quantity & quality.

In distribution logistic a company can have a private fleet of vehicles or it can collaborate with 3PL to provide the delivery services.

WGBL partners with various transporters for its distribution services to various channels. At WGBL the goals of availability & cost minimization are duly met but there is no proper system that measures the influence part i.e. the customer satisfaction which directly depends upon the transportation service level. Transporter evaluation is one of the major pain area of WGBL.

There are two alternatives to this problem:

- 1) Doing excel based calculation for each transporter & corresponding shipment based on captured data, which will be time consuming & inefficient process.
- 2) Using Power BI – a business intelligence tool for analysing and decision making based on data captured.

Is it suitable to evaluate transporter only on the basis cost charged to transport the product? OR Other KPI (key performing index) should be

identified along with cost to evaluate the transporter.

Major transporter KPI identified at WGBL:

- Average rate per kg of transportation for each destination & source city
- Lead time to make the delivery
- Number of ON Time deliveries

There are various methods of transporter evaluation:

- A) Categorical Plan
- B) Weighted Point plan
- C) Cost ratio method
- D) Evanston's Vendor Selection
- E) Forced decision matrix
- F) Service Cost Ratio

WGBL can go with weight point method for transporter evaluation. With weights given (decided by the SCM department) to each KPI as follows:

KPI	Weights
Average rate per kg of transportation for each destination & source city	0.2
Lead time to make the delivery	0.4
Number of ON Time deliveries out of total deliveries made	0.4

Table 1 KPI Weightage

three of the logistic provider for the company were evaluated on this basis for each source & destination city. Transporter score is assigned by the evaluator on the basis of performance on each KPI. i.e. for average rate it is preferred to have lower value hence a higher cost is assigned corresponding to transporter having lower cost.

Similarly, for other transporters. Whichever transporter is having the highest total score will be given the preference for shipment to particular region. E.g. From table it clearly shows Spoton is preferred 3PL provider for a defined source & destination city.

KPI	Weights	Transporter Score		
		Gati	V Express	Spoton
Average Rate	0.2	20	30	40
Lead Time	0.4	50	60	70
On time deliveries	0.4	80	90	100
Total Score	1	56	66	76

Table 2 Weight Point Metrix

Similar power BI model can be made for transporter evaluation using suitable power query calculations.

Conclusion:

Calculating cost to serve at the product level WGBL would be able to truly determine the profit margins which affects the bottom line of the company. They can take decision about the discontinuing the product or increasing the selling

price or consolidating the shipment in such a way that it reduces the overall cost to serve of that product.

Evaluating the performance of the transporter WGBL can select best of the available transporter for the distribution and hence can improve the customer satisfaction which in turn can help improve the business.

Using the capabilities of the Power BI, the analysing & visualising capabilities can be improved and also it will positively affect the accuracy & speed of decision making for the above processes.

Task Ahead for WGBL:

Can other evaluation methods stated above can be used for the evaluation? Can other values of the weights be used? There are more detailed models available for transporter selection that are AHP, ANP, TOPSIS etc. which could be used. Also company can try to have API integration with the transporter for smooth data sharing between them. Real time capturing of the reasons of the late delivery by the transporter can also help to evaluate transporter on more detailed level. Also WGBL can focus on the consolidation of the shipment to reduce cost to serve based on the history of the shipments.

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