OVERVIEW

Overview of Unilever

Unilever is a British-Dutch Company that deals on the production and sales of Fast Moving Consumer Goods (FMCG). FMCG is also described as Consumer Packaged Goods (CPG) (Suganthi, 2016). Unilever has over 400 products which includes both essential and non-essential foods. It has products that are categorized into four brands namely:

- Beauty & Personal Care (Rexona, Dove, Lux, Aviance, Fair & Lovely, Axe, etc.)
- Foods & Refreshment (Blue Band, Magnum Knorr, Lipton, etc.)
- Home Care (Vim, Drive, Surf Excel, Cif, etc.)
- Water Purifier. Unilever Truliva and Pureit

Scope of Operational Area

Unilever products are used in over 190 countries in the world. Unilever makes use of Global Ultra Logistic Control Towers in its operation through networking (Unilever, 2015). The scope of the operational area is on planning specifically on the management and control of inventory and this will help to minimize costs, improve customer services and reduce the emission of CO_2 thereby increasing its revenue.

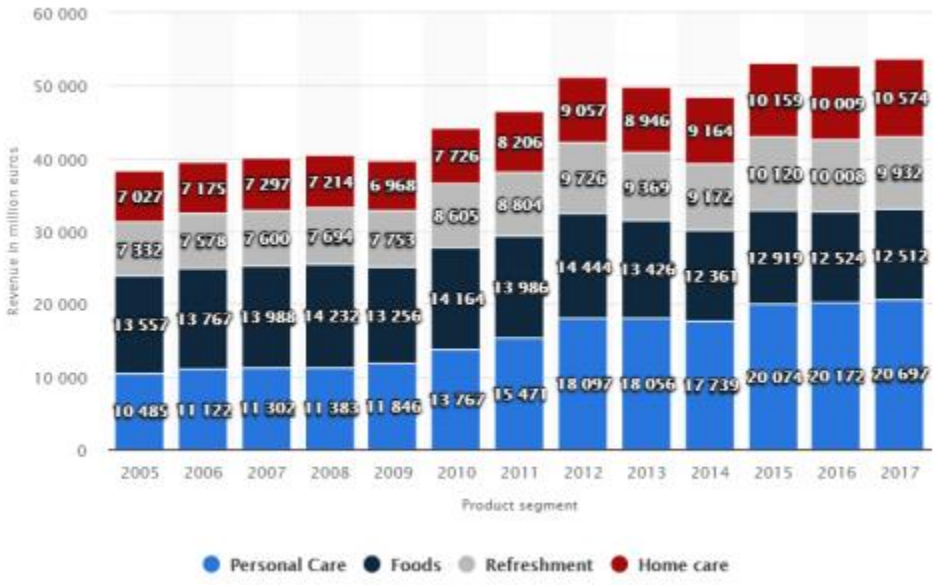

Figure 1: Global revenue of the Unilever Group from 2005 to 2017, by product segment (in million euros). Source: statista.com

PLANNING ENVIRONMENT AND KEY VARIABLES

Framework /Methodology

The model adopted for the planning operations in the management and control of inventory is the Economic Order Quantity (EOQ) Model. EOQ Model was formulated by Ford W. Harris in the year 1913. The application and in-depth analysis of this model is credited to R.H. Wilson and Andler K. (Hax and Candea, 1984). EOQ model is a Classical Production Scheduling Model and it is useful in determining the quantity of item to reduce in order to reduce total cost. Total cost here refers to the Handling / Carrying Cost and the Ordering Cost (Senthilnathan, 2019).

The key decision for this study is to reduce total cost specifically Total Incremental Cost (TIC) which is a component of total ordering cost and total handling or carrying cost.

The Key variables are;

- Total Carrying Cost (TCC): This is the cost involved in maintaining and holding the product until it is sold. This cost include cost of storage/warehousing, detoriation, spoilage, obsolescence, loss due to shrinkage, and other related overhead cost. The handling cost per unit is equal to the cost of maintaining the total demand for product hence handling cost increases as the number of products (Q) to be stored increases.

- Total Ordering Cost (TOC): This is the cost of orders to be placed in order to produce a product. This include cost of inspection, order printing, stationary, transport, product receiving, purchase personnel payment, etc. The ordering cost is also constant within the period irrespective of the number of orders placed. However, the ordering cost reduces as the number of orders increases and vice versa.

ORGANISATION'S ANALYTIC CAPABILITIES IN INVENTORY MANAGEMENT AND CONTROL.

Unilever has over 400 products which ranges across the four categories (Beauty & Personal Care, Foods & Refreshment, Home Care and Water Purifier) with 13 brands (Axe, Dove, Heart brand, Hellmann's, Knorr, Lipton, Lux, Magnum, Omo, Rama, Rexona, Sunsilk, Surf).

Figure 2: Unilever Products. Source: Unilever 2018

The 4 Categories are selected for ABC Analysis. This is analysis is used to ascertain which area should receive intense concentration and which should be considered less intensely based on the financial performance of each category.

TABLE 1: KEY FINANCIAL INDICATORS & PRODUCT CATEGORY	YEARS		
GROUP	2018	2019	2020
Turnover Growth	5.1%	2.0%	2.4%
Underlying Sales Growth	3.2%	2.9%	1.9%
Operating Margin	24.8%	16.8%	16.4%
Free Cash flow	€5.4bn	€6.1bn	€7.7bn
BEAUTY AND PERSONAL CARE			
Turnover Growth	0.3%	6.0%	3.4%
Underlying Sales Growth	3.4%	2.6%	1.2%
Operating Margin	20.2%	20.7%	20.4%
Turnover	€20.6bn	€21.9bn	€21.1bn
FOODS AND REFRESHMENT			
Turnover Growth	9.9%	4.6%	0.8%
Underlying Sales Growth	2.2%	1.5%	1.3%
Operating Margin	36.0%	14.6%	14.4%
Turnover	€20.2bn	€19.3bn	€19.1bn
HOME CARE			
Turnover Growth	4.2%	6.9%	3.4%
Underlying Sales Growth	4.7%	6.1%	4.5%
Operating Margin	11.7%	12.7%	11.9%
Turnover	€10.1bn	€10.8bn	€10.5bn

Source: Unilever.com

From the table 1, it shows that Beauty and Personal Care has higher turnover and less fluctuating operating margin while the turnover growth for Foods and Refreshment declines adversely but its underlying sales growth and turnover does not decline widely. The Home Care category of products had a less fluctuating operating margin and turn over but its turnover is small compared to beauty & Personal Care and Foods & Refreshment Products.

Turnover is used to depict how quickly, a company sells its product. An increase in turnover implies that the products have less handling cost and vice versa ().

Based on this Analysis, Beauty and Personal Care Products can be classified into category A, Home Care Product can be classified into category B while Foods and Refreshment should be classified into C.

Category A has higher turnover growth and turnover with a less declining operating margin, hence Unilever is advised to concentrate more in the production of Beauty and Personal Care. Category B has the ability yield more turnover because of the sharp increase and decrease, Unilever should concentrate in producing more Home Care Products to increase turnover.

Category C declines so much in its turn over growth from 9.9% in 2018 to 0.8% in 2020 which implies that further investment in this products may only lead to loss, therefore Unilever should

focus less on producing it while researching on best ways to improve Foods and Refreshment Products.

DISCUSSION AND ANALYSIS OF THE APPLICATION OF EOQ MODEL

Unilever make use of the Break-even Analysis but this study seek to suggest that the EOQ Model is used to manage their inventory and reduce total cost.

The EOQ Model is useful for the determination of the number of goods to produce so as to increase total revenue and reduce total cost of handling and ordering inventory. The EOQ Model has underlying assumptions that guides its performance. They are:

- EOQ will be performed for each product of the business
- The Annual Demand for each product in units is certain
- The Ordering Cost is constant and certain throughout the period
- The Handling Cost is constant and certain for the year
- Cash or quantity discount is not allowed
- There is no time lag or delay in stock replenishing
- The ordered quantity is delivered at once in one batch
- Lead time is constant

The Mathematical expression of the EOQ Model is given as follows:

TOC = Cost per order**.** (Demand / Quantity Ordered annually)

$= C_0 . (D/Q) = \frac{DCo}{Q}$

TCC = Cost per unit for carrying**.** Average quantity handled in store annually

$= C_c . (Q/2) = \frac{Q\mathrm{Cc}}{2}$

TIC = TOC + TCC

$= \frac{DCo}{Q} + \frac{Q\mathrm{Cc}}{2}$

TIC depends on the quantity ordered in other to minimize cost, it is necessary to differentiate TIC with respect to Q that is $\frac{d(TIC)}{dq} = \frac{-DCo}{Q^2} + \frac{\mathrm{Cc}}{2}$

For maximization of profit and minimization of cost, $\frac{dTIC}{dq} = 0$

$0 = \frac{-DCo}{Q^2} + \frac{\mathrm{Cc}}{2}$ thus, $\frac{\mathrm{Cc}}{2} = \frac{-DCo}{Q^2}$

$Q = \sqrt{\frac{2DCo}{Cc}}$

To confirm that TIC for the value of Q has been minimized $\frac{d^2(TIC)}{d^2q}$ must be >0 for the value of Q

We take the second derivative of TIC

$\frac{d^2(TIC)}{dQ^2} = \frac{2DCo}{Q^3}$ for the value of Q* = $\frac{d^2(TIC)}{d^2q}$ >0 TIC will optimally minimize cost

Therefore, Q = Q* =EOQ (Economic Order Quantity)

ILLUSTRATION

Assuming Dove Body Lotion (Unilever Beauty and Personal Care Product) has an annual demand of 500000 units, the cost per order is €0.05 and the carrying cost for each unit is €2, determine the Economic Order Quantity.

SOLUTION

D = 500000, C_O = €0.05 and C_C = €0.08,

To find TOC and TCC, find Q

$Q^* = \sqrt{\frac{2DCo}{Cc}} = \sqrt{\frac{2(500000\ .\ 0.05)}{2}} = 158$

TOC = C_0 . (D/Q) = $\frac{DCo}{Q}$

= €0.05. (500,000 / 158)

= €158

TCC = C_c . (Q/2) = $\frac{QCc}{2}$

=€2**.** (158 / 2)

= €158

TIC = TOC + TCC

€158 + €158 = €316

To find the number of order to have optimal TIC for the year in order is

D/Q* = 500,000 / 158 = 3,165

The Result shows that there exist a tradeoff point of the Economic Order Quantity (Q*) between TOC and TCC. It shows that TOC = TCC and TIC is the minimum of the sum of total cost.

Unilever Optimal number of order in the production of Dove Body Lotion is 3,165 and the optimal quantity to order is 158 at a total incremental cost of €316. At this point, the firm will minimize cost and maximize profit.

KEY CHALLENGES

The assumptions of the EOQ Model are eventually the challenges of the model. For example, an amount of money invested in the bank will yield a compound interest with respect to the compounding year. This does not hold true for the cost of holding inventory and thus cost of holding inventory is underestimated although, these can be resolved by continuous compounding of the annual inventory cost (Caliskan 2020).

Another challenge is on what happens to the model when there is inflation because it holds all cost and demand to be constant.

CONCLUSION AND RECOMMENDATION

In conclusion, the EOQ model is a very useful tool that can guide the management of inventory in Unilever if properly used by adjusting the model to include the necessary annual compounding. Also, the sensitivity of the ABC Analysis can be juxtaposed with the EOQ model to give an accurate decision and planning of the operation of Unilever.

This study recommends that based on the result obtained, further analysis should be performed on each product using the EOQ model.

REFERENCES