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A Cumulative Approach towards Fixing Constraints of an Organizational Output as per Concluding Break Even Point by Simulink Model

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Abstract
A strategy (business or marketing) that integrates an organization's marketing goals into a whole segment internal (organizational) and external (competitive) level, ideally drawn from market research, emphasizes on the ideal product mix to achieve maximum profit potential. In the following research article author emphasize on various types of non-linearity associated with product development phase to lose control on its production output. It is usually a bundle of tangible and intangible value of attributes which decides the role of marketing regarding benefits, features, functions and its usage that a seller offers to a buyer for purchase, the optimize value is calculated by applying non-linear mathematical genetic algorithm function with interaction of variable (A) and (B). The main objective is to study the breakeven analysis by setting a second order transfer function of output of given organization here author wants to calculate the output transfer function of an organization with a set of given input variables (it may be quantity of raw material, time, money etc) various constraints decides the output of any organization. The following paper incorporates with concluding product mix with non-linearity error inside the organization and its effect outside variable. The calculation of output variable in terms of contribution has been made by applying simulation and tool of simulation is Matlab.

Keywords- Break-Even Analysis, Organization Management, Sales Structure, Matlab Programming.

1. Introduction

Management deals on the accordance which leads to a firm's goals can be best achieved through identification and satisfaction of the customers' stated and unstated needs and wants (Garegnani, 1970; Brownlie, 1963), obeys an ideal situation in which the distribution of an commodity is exactly equal to its demand, since there is in between ample or less quantity in the market in terms of goods and services, price tends to remain stable in this situation (Vienneau, 2005), a sequence by which goods or services flowing in pipeline towards one direction (from vendor to the consumer), and the payments incurred by them that flow in the opposite direction (from consumer to the vendor). Each intermediary receives the item at one pricing point and moves it to the next higher pricing point until it reaches the final buyer, also called channel of distribution (Anyadike-Danes and Godley, 1989), a planned mix of the controllability achievable elements of a product's marketing plan commonly termed as 4Ps: product, price, place, and promotion, these four elements are collaborated in a desired pattern until the right combination is found that serves the needs of the product's customers, while

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generating optimum income. Sometimes the first P (Product) is substituted by presentation (Opocher and Steedman, 2009; Dutt and Skott, 2006).

1.1 Break-Even Point

The break-even point is an intersection of area between profit and loss regions concludes about an ideal no profit no l oss situation at intersecting point. It follows a graphical presentation where total contribution (Samuelson, 2000; Aswal, 2012; Aswal and Singh, 2012) has been calculated in terms of profit and loss situation, an ideal graphical presentation depicts the profitable situation leads for minimization of losses in the growth of particular organization structure based upon the sales of unit and other various outcome of an organization (Rogers, 1989; Bouman, 2011). At that point, all of the business's input constraints of revenue are profit as long as the expenditure along with the costs are not increased and the sales amounts are not reduced (Garegnani, 1970).

1.2 Decisions

The break-even point concludes the sales oriented output of an organization, the various input constraints and its contribution for achieving the profit earning organization is decided by an organization. Optimization is a big issue for maintain the proper utilization of resources (Cohen, 1983; Humphrey, 1992; Aswal and Kumar, 2012). How exactly and efficiently the resources have been optimized so that the demand and supply graph matches the profit of an organization. The fixed cost of production not easily optimize for an instant but variable cost decides the reasonable attribute for production.

1.3 Fixed Costs

Besides in the business's variable costs, the fixed costs are not directly related to the development of the business's products and services. Fixed costs are the costs involved in making of goods from transportation of raw input to the dispatched output of an organization (Aswal and Kumar, 2012; McGuigan et al., 2001). There are a wide array of decisions and changes the business leads to implementation of deduction and controlling of fixed costs, (Roger, 1989) few growth decisions may include solving around for competitive value rates, implementing a paperless work environment, paying bills on time to reduce interest rates and implementing a quality control or quality assurance program to improve accuracy and efficiency. Strategic decisions are made for enhancement of sales volume, such as these, have direct and indirect effects that reduce the business's cost of operation and break-even point (Rosen, 2005).

2. Calculation from Optimization of Production Industry

The nonlinear genetic algorithm method is used for calculating and modeling of Indian production industrial sector taking the non –linear equation. n terms are taken for more précised simulating term in the data analysis.

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$\sum=\alpha A+\alpha B+\sigma AB+\beta^2A^2B+\beta^2AB^2\ldots\ldots\ldots\ldots\ldots\ldots n$ as in Table 1.

Standard errors should be similar within type of coefficient. Smaller is better. The ideal VIF value is 1.0. VIFs above 10 are cause for concern. VIFs above 100 are cause for alarm, indicating coefficients are poorly estimated due to multi-co linearity. Ideal Ri-squared is 0.0. High Ri-squared means terms are correlated with each other, possibly leading to poor models. If the design has multilinear constraints multi co-linearity will exist to a greater degree, thus increasing the VIFs and the Ri-squareds, rendering these statistics useless. Use FDS instead. Power is an inappropriate tool to evaluate response surface designs. Use precision-based metrics provided in this program via Fraction of Design Space (FDS) statistics. The set of model is to be an estimate of the terms you expect to be significant as in Figure 1.

Table1 (a) and Table 1(b) Signifies
Factor Coding: Actual.
Std Error of Design.
Design Points.
Std # 9 Run # 13.
X1 = A: Monthly = 3.
Actual Factor.
B: Unit = 6.4.
Y = Std Error of Design = 0.447.
Power calculations are performed using response type "Continuous".
Delta=2, Sigma=1.
Power at 5 % alpha level to detect signal/noise ratio of:
(i) Basis Std. Dev. = 1.0.
(ii) Approximate DF used for power calculations.
Power is evaluated over the -1 to +1 coded factor space.

3. Contribution Margin (Using Simulink Model)

Contribution margin is the amount which remains from sales revenue after variable expenses have been deducted, based upon the number of volume. Thus it is the balance variable available to cover certain fixed expenses and then to provide profits in the desired period. Contribution margin is first used to cover the fixed expenses and then the remaining elements move towards profits. If the contribution margin is not sufficient to cover the fixed expenses, then a loss occurs for the period. Sales revenue − Variable cost (Man, Machine and Material) = Contribution Margin and Contribution margin − Fixed cost (Man, Machine and Material) = Net operating Income or Loss further clarification of the basic concept of cost volume and profit Analysis in the linear Cost-Volume-Profit Analysis model, the break-even point (in terms of unit Sales (Z) can be directly computed in terms of Total Revenue (T_R) and Total Costs (T_C) as:

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$$DTR/dt=dT_C/dt \quad (1)$$

$$dP/dt \times dZ(y)/dt= T_{FC} + V \times dZ(y)/dt \quad (2)$$

$$P \times dZ(y)/dt - V \times dZ(y)/dt = T_{FC} \quad (3)$$

$$(P-V) \times dZ(y)/dt= T_{FC} \quad (4)$$

$$dZ(y)/dt= T_{FC}/(P-V) \quad (5)$$

T_{FC} is Total Fixed Costs, assuming ideally constraints constant with respect to demand. P is unit Sale Price, marginally constant with respect to demand. V is unit Variable Cost, ideally constant but varies with various product (tangible) or Service (intangible) and marketing parameters, the Break-Even Point can be calculated as the point where Contribution equalizes Fixed Costs, according to eq (1) total revenue and total costs varies with respect to time and exactly equal as depends upon number of units sold with respect to time (Aswal et al., 2014; Samuelson, 2000). The quantity (P-V) is of interest in its earned value leads to differential value of (revenue or Costs) generated based on number of unit sold, and is called the Unit Contribution Margin (C) is the marginal profit per unit, or alternatively the portion of each sale that contributes to Fixed Costs. Thus the break-even point can be more simply computed as the point where Unit Contribution x Number of Units = Total Fixed Costs and Number of Units = total fixed costs/ Unit Contribution as variable parameter when contributed with respect to time, when sales proceeds to reach break-even, one can use the above calculation and multiply by Price, or equivalently use the Contribution Margin Ratio (Unit Contribution Margin over Price) equates Break-Even (in Sales) = Fixed Costs/C/P all depends upon various Contributory parameters such as manufacturing cost, packaging Cost and Marketing costs. R=C, Where R is revenue generated, C is cost incurred i.e. Fixed costs + Variable Costs or Q x P (Price per unit) = T_{FC} + dQ/dt x d(VC)/dt {as differential varies dV/dt and dC/dt } (Price per unit w.r.t time), dQ/dt x P - Q x d(VC)/dt = T_{FC}, Q x {P – d(VC)} = T_{FC}, or, Break Even Analysis Q = TFC/c/s ratio=Break Even as shown in Figure 2 and simulating model in Figure 2(a).

3.1 Results

The following block diagram depicts the organization input throughout 24hrs in a day. In which real and imaginary components are added up, shows that each input corresponds to state space parameters assigning the (default Values) of constants (A=B=C=D=1). The states input to the Organization Block which keeps the second order transfer function as most linear practical implementable system corresponds to second order function. The non-linearity or error signal applied of organization (contributory output). Error signal gives the apposition or acceptance of a product in a particular segment of a market. Sine and Cosine wave Generation is for the variation in the fixed and variable costs as well as second order Transfer function $1/(S^2+2S+1)$ is an second order function with $\omega^2_n=1$ & $2\zeta\omega_n=2$. Dead Zone is the error introduce in the following second order Transfer Function even though the rise in profit shifts ahead but does not shows the drooping characteristic. The following Non-linearity doesn't effect the Profit Margin besides the introduction of variable Contribution leads to the Profit and Organization leads to rise in sales. Scope1output shows the rise in Profit whereas Scope2 output shows the stabilization in error signal introduction and the sine and cosine graphs leads to steady state value.

3.2 Reasons for Decline

There can be numerous factors causing decline in which few can be quarantine and can be detected simple manner, whereas the other factor is qualitative which is not so simple to detect. Decline may occur due to unfavorable changes in the external environment.

Quantitative/Computable Rationale for Decline

Computable diagnosis is easily found in the organizational financial statements, internal operation written records and by other computable parameters.

Reduction in Work Force: Shortening in size of the organization reveals a declining of total market, reduction in demand and lacks in potential to deliver the product.

Reduction in Market Share: Reduced Market Shares of company signifies several matters, growing competition if the overall total market is actually growing or is steady or due to outmoded product or technologies.

Reduction in Profit or Share Price: It contributes the investor's opinion about the companies operating verge and its hope for growth in future.

Qualitative/Dependent Factors for Decline in Organizational Life Cycle

Fierce Competition/Vicious Competition: Throughout the entrepreneurial stage, the big companies may use all their potential to dominate the new emerging companies that is totally newly arrived in the market.

Scarcity of Customers: It generally occurs because of unexpected decline in the niche market, as product preferences changes with time. It generally happens because the organization lacks in finding the appropriate market for the product. It is likely to happen at any phase of life cycle.

Outdated Technology: One of the most significant factors for decline in life cycle is the overdrive of outdated technology. Overuse of orthodox technologies can adversely affect its core business and competencies.

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Economic Decline: Tough Economic Environment diminishes the customer purchasing interest; vendors in the market compete due to reduced market share. It struggles to obtain optimum credits and finances for upcoming ventures or existing ventures.

Organizational Atrophy/Devastating Activities: It generally takes place in older organization that has experienced sanguine growth along with long term stability. The stratified structures and the other internal revenue environment of such huge organization magnified are large with immense man power. The central management is incumbent on incompetency; management system of organization is inordinate and defamatory. At last leadership crisis takes place. Employer/Workers tend to lose trust in the leadership and its vision. The employee’s satisfaction level begins to fall down consistently along with the operational efficiency level.

4. Transfer Function Model for Contribution Analysis System

In any business the estimated Fixed costs is remains constant at the time of calculation, in this way the introduction of contributory Transfer Function came, in this transfer function.

Following data set is assigned.
F1(s) = 2 at (t=0) -------------------------denotes the Fixed Cost
F2(s) = t+1------------------------------------denotes Contribution.

The complete company performance is denoted by the Transfer function dividing F1(s) by F2(s) --- T(s) = F2(s)/F1(s).

Sales in year is a Scope which defines the output of a company and decides the projected Break – Even point at different time intervals in years as in Figure 3 and Figure 4.

5. Conclusion

The following output Graph depicts the waveform, which decides the different Break-Even points of an organization, as we seen in this graph this is shown by the parabolic characteristic curve and each point in the curve states that different Parameter which is Variable (i.e. fixed cost is a constant quantity and variable parameter is only the contribution cost as it at short of compensation). Thus we can predict the possible contribution applied to maintain the profit-loss situation, keeps helpful in managing and organizing the Resources. It is an experimental value of assigning different parameters and its contribution decides about effectiveness of an organization. The main role of organizational substituting parameters like Constraints A, B, C, D sine, cosine wave generators and Dead Zone parameters solves the organizational level output. The basic role of sine and cosine wave introduction is about its similarity towards Product or Organizational Life Cycle.

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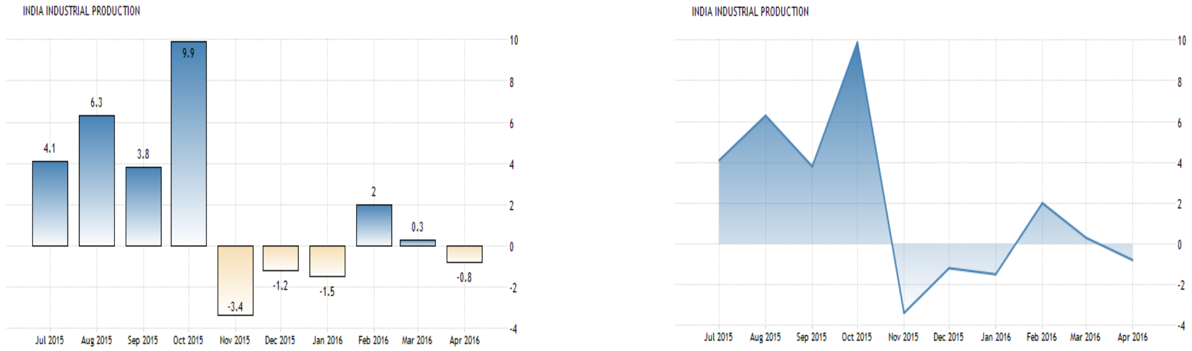

Figure 1. Break even points

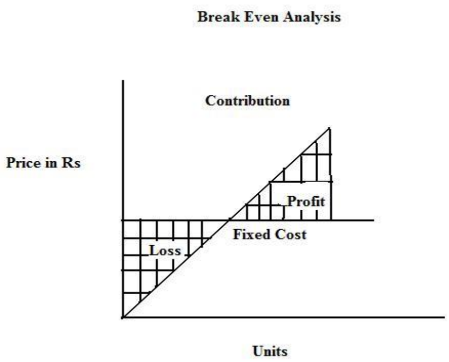

Figure 2. Break even analysis

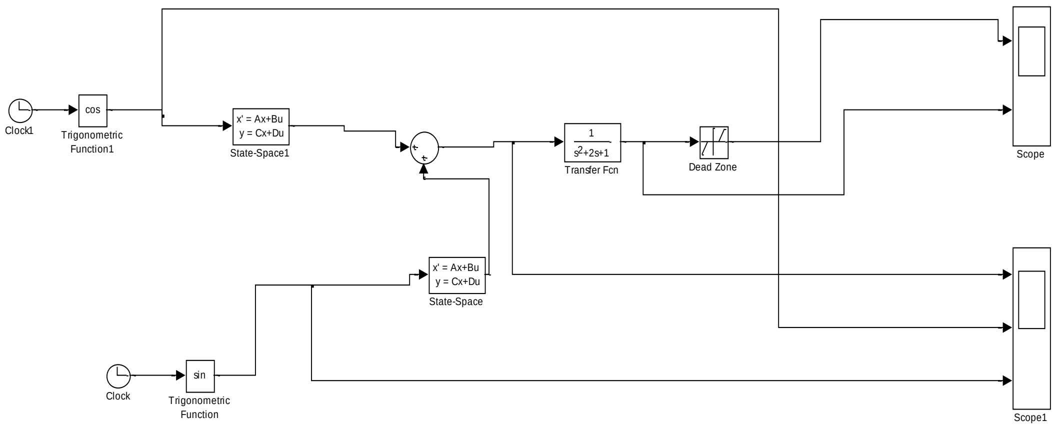

Figure 2(a). Simulation

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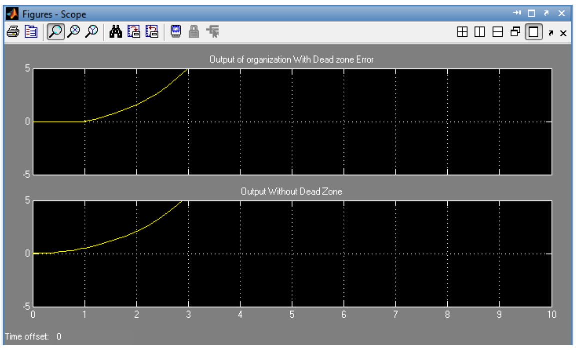
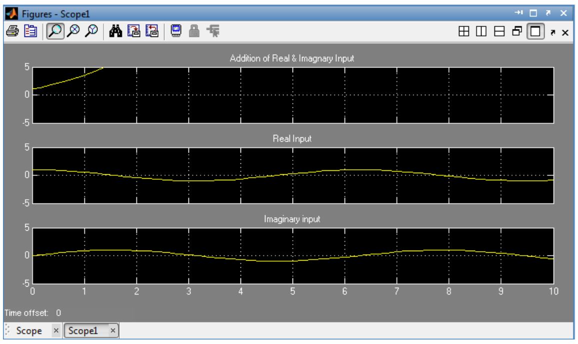


Scope



Scope1

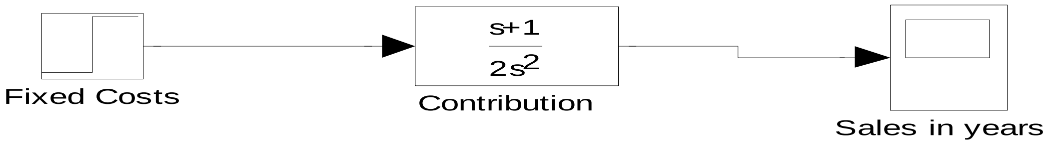


Figure 3. Contribution as a process

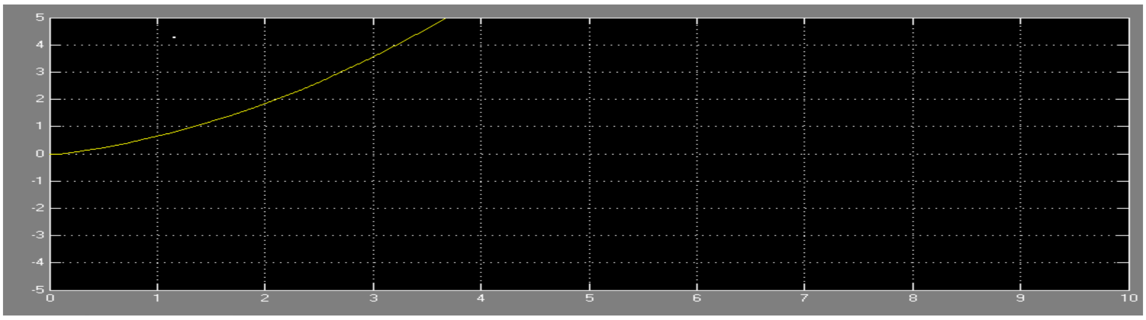


Figure 4. Sales in year

		Factor 1	Factor 2	Responce2	Response 1	Response 1
Std	**Run**	**A:Monthly**	**B:Unit**	**R1**	**R2**	**R3**
		1-5	**%**	**Calculated**	**Actual**	**Previous**
8	1	3	25.6333	6.4	-0.80	0.10
11	2	3	6.4	6.4	-0.80	0.10
6	3	5.82843	6.4	6.4	**N.A**	**N.A**
10	4	3	6.4	6.4	-0.80	0.10
13	7	3	6.4	6.4	-0.80	0.10
12	8	3	6.4	6.4	-0.80	0.10
7	9	3	-12.8333	6.4	-0.80	0.10
5	10	0.171573	6.4	6.4	**N.A**	**N.A**
9	13	3	6.4	6.4	-0.80	0.10

Table 1(a). Predicted vs. actual response (contribution)

Term	StdErr[1]	VIF	Ri-Squared	2 Std. Dev.
A	0.35	1.00	0.0000	68.1 %
B	0.35	1.00	0.0000	68.1 %
AB	0.50	1.00	0.0000	40.8 %
A^2	0.38	1.02	0.0170	99.4 %
B^2	0.38	1.02	0.0170	99.4 %

Table 1(b). Error deviation

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