ENTREPRENEUR DECISION MAKING PROCESS AND APPLICATION OF LINEAR PROGRAMMING TECHNIQUE

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ABSTRACT

The paper empirically examined the impact of Linear Programming in entrepreneur decision making process as an optimization technique for maximizing profit with the available resources. The paper draws example from Kingston Joe Nigeria Limited a fast food firm who encountered some challenges in the production of meat pie, chicken pie and do not due to an increment in the price of raw materials. The paper used linear programming technique to analyse the problem encountered by this firm and therefore provide and optimum solution with recommendation that it should discontinue the production the production of children pre and do not and concentrate with production of meat pie.

Keywords: Entrepreneur Decision Linear Programming Model, Optimum Solution.

INTRODUCTION

An Entrepreneur is a person who performs entrepreneurial function. In line with Ogundele and Olayemi study (2004). They define Entrepreneurs as an agent of social and economic change. It has been asserted by Akiniyi (2008) that the growth and expansion of a business depends critically on the decision of the entrepreneurs. Those decisions include pricing decision, the identification of target market, ensuring standardization of the company's product, the level of technology involvement, manpower a nd others.Every entrepreneur is faced with the task of making decision as regards to efficient allocation of the available resources at his disposal to various areas of need of the concerned organization.

This is necessary and sufficient so as to minimize the cost incurred while maximizing profit earned. Such resources allocation decisions are adopted through the use of quantitative technique such as Linear programming. Simplest Tableau, Transportation model, Net work analysis, sensitivity analysis and a host of others.

Linear programming according to Heizer and Render (2004) is a mathematical technique used to rationalize many managerial decision as regards the allocation of economic resources. Akiniyi (2008) also defined it as an optimization instrument used to analyze constrained optimization problems in which the objective function is a linear function which can be maximized or minimized subject to Linear inequality constraints.

Against the background, the study intends to examine the relevance of Linear programming technique in entrepreneur decision making process. The rest of the study is structured as follows: following the introduction is section two which dwell on the selected existing Literature. Section three of the study captures the application of the Linear programming technique in Entrepreneur business. The last section concludes the study with policy recommendations.

Selected Existing Literature

There seem to be paucity of Literature on the application of Linear programming to he entrepreneur decision making process. However he few studies selected are reviewed below. Agbadudud (1996) mathematical technique for finding the beet uses of from Limited resources. He posited further that it is a method for resolving problems associated with resources allocation. Brandimartye (2011) asserted that Linear programming are used when the objective function of a business enterprises are expressed in Linear functions. In another study by Dwivedi (2003) Linear programming are best suited for finding optimum solution to the problem of resources allocation in order to achieve certain ends under the prescribed conditions. The Linear programming components were also identified by Taha (2011), Brown (1997),Stevenson (2005), Krajewoki and Malhora (2007), Dwivedi and Brudnick (1988). The components according to them are the proportionality. Additively, Non – negativity, Linearity, deterministic and with fixed external factors.

Finally, according to the chartered institute of Management accounting, 2009) is a technique designed to assist management in solving optimizations problem subject o limitation or imposed restriction.

APPLICATION OF LINEAR PROGRAMMING IN BUSINESS DECISION
Basic Assumption of Linear Programming Technique

The Linear programming technique assumes the following conditions: There must be a Linear relationship between the output of each product and the total quantity of each resources consumed. There should also be only one objective function in a particular problem which could be profit maximization or cost minimization. Other major assumption is that he values of the activities should not be negative. Once these assumptions are satisfied, then we can go on to formulate Linear programming problem. The formulation of Linear programming problem required decision variables such as Y_1 and Y_2. Also the need to define the objective function as Maximize $Q = 6y_1 + 4y_2$ Subject to certain constraints such as labour hours, machine hours ate.

Mathematical Formulation of Linear Programming

Based on the above definitions, the Linear programming model can thus be stated as:
Maximize Minimize.

$$Z = C_1 X_1 + C_2 X_2 + \ldots\ldots. (n Xn$$

Subject to structural constraints

$$B = \begin{cases} B_{ii} X_1 + b_{12} X_2 + \ldots b_{in} X_n (\geq) (\leq) a, \\ B_{21} X_1 + b_{22} X_2 + \ldots b2_n X_n (\geq) (\leq) a_2 n \\ Bm_1 X_1 + bm_2 X_2 + \ldots bm_n X_n (\geq) (\leq) a_m \end{cases}$$

Having formulate the Linear Programming problem, it becomes necessary to demonstrate its application with concrete example.

Kingston Joe Nigeria Limited is a fast food firm that has a caterer that bakes chicken pie, meat pie and do not. The owner wishes to know which of the above snacks he should not engage in as a result of increment in the price of flour and margarine. The illustration below gives the contribution made by each snacks and the quantity of materials needed to make them.

The firm above has three products as described above and this is represented by X_1, X_2 and X_3. Therefore the firm wishes to maximize
$\pi = 40X_1 + 50X_2 + 70X_3$ as the objective function subject to $200X_1 + 50X_2 + 100X_3 \leq 1000$ flour constraint.

The solution to the above problems follows seven steps as shown in the table above namely.
1. The conversion of the Linear Programming problem to standard form.
2. Introducing the slack variable in the objective function.
3. Drawing the initial tableau.
4. Identification of Pivot row, by dividing the entire pivot column by the entire 'a' column (the right and column).
5. Drawing the second tableau by introducing the pivot row into the slack variable (SV) where the pivot element was derived (X_3) and divide each number with entire row by the pivot element. And the last step shows, if there is a negative value it implies we have not reached on optimum level, we them proceed to draw the third table following the same procedure.
$50X_1 + 20X_2 + 40X_3 \leq 600$ Margarine Construct.
$20X_1 + 30X_2 + 40X_3 \leq 1600$ Eggs Construct.

But, based on the assumption of non – negativity constraint then X_1, X_2, $X_3 \geq$ O. Since we have more than two variables, the appropriate technique is the use of simplex method to solve this problem so as to obtaining optimal solution. Once this problem is stated then, a table is formed based on the information.

Table 1 A: Major Ingredients involved in the backing process.

	Chicken Pie	Meat Pie	Do not	Resources
Flour	100	50	100	1000
Margarine	50	20	40	600
Eggs	20	30	40	1600
Contribution	40	50	70	

Table 2. The Initial Table

SV	X_1	X_2	X_3	S_1	S_2	S_3	A
S1	100	50	100	1	0	0	1000
S2	50	20	40	0	1	0	600
S3	20	30	40	0	0	1	1600
π	-40	50	-70	0	0	0	0

Table 3. Second Table

SV	X_1	X_2	X_3	S_1	S_2	S_3	A
X3	1	½	1	$1/100$	0	0	10
S2	10	0	0	$-40/100$	1	0	200
S3	-20	10	0	$-40/100$	0	1	1600
π	-30	-15	0	$4/10$	0	0	700

Table 4. Third Table

SV	X_1	X_2	X_3	S_1	S_2	S_3	A
X2	2	1	1	$1/30$	0	0	4
S2	10	0	0	$-2/5$	1	0	200
S3	-40	0	-20	$-3/5$	0	1	1000
π	60	-	30	1	0	0	1000

Table 5: The findings of the Linear programming (EPP)

Decision Variables	Optimum Value	Recommendations
X_2	A	Produce A grams of Meat Pie daily.
S_2	___	There is a surplus in chicken Pie and
S_3	___	Do not resources of 200 and 1000
π	1000	respectively which need to be harnessed in order to maximize profit for the business.
		Daily profit amount of N1000.

CONCLUSION

This study investigated the relevance of Linear Programming in entrepreneur decision making process using KingstonJoe Nigeria Limited a fast food located at Igando in Lagos State of Nigeria. The study realized that allocations problems can be optimally and efficiently evaluated to enhance management decision. The study observes that skill application for optimization technique made it possible for the entrepreneur decision process. It also aware of the presence of some software's system that are available to enhance speed and accuracy of linear programming models such as Microsoft excel spread sheet, Ruddy Ricks and others which could better understanding of how the optimum solution can be obtained.

The study therefore recommends that the firm should discontinue the production of chicken pie or donut or both to concentrate on Meat Pie. Also ensuring staff training on the practical demonstrations of how to bake Chicken Pie or donut as well as checking through the production for possible lapses and taking quick action.

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