

Diagnosis of the reality of supply in Algerian Economic Enterprises using the programming model goals

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Abstract:

The subject of the supply chains of important topics and modern is applied both at the academic level or where interest in it only started during World War II where it is applied in the military field. The economically it has begun to concern the supply of the urgent necessity imposed by the competition resulting from the development of institutions that require reducing costs and improving customer services of the quantitative and qualitative terms in order to expand its activities, and get a place in the market . the supply chains which has become an important function of the functions of production and trade enterprise with respect to needs material contained Supply, production, distribution, as well as the flow of information.

Keywords: the supply chains-the programming model goals-economic enterprise- distribution.

المخلص:

وعيا من الحكومة الجزائرية بأن قطاع المحروقات لا يشكل موردا مستداما، ما فتئت منذ بضع سنين الحد من تبعيتها لهذا المورد غير قابل للتجديد، متخذة بذلك قرار تنويع اقتصادها بانتهاج سياسات إنمائية طموحة قائمة على إحياء قطاع السياحة وبالأخص، تطوير السياحة الثقافية المستدامة الكفيلة بتحقيق التوازن بين الأنشطة الاقتصادية والتماسك الاجتماعي والحفاظ بطريقة أكثر صحة على التراث الوطني، ويشكل في ذات الوقت دعما حقيقيا لحماية تراث المدن الجزائرية. وعليه فإن الهدف من خلال هذه الورقة العلمية يتجلى في تحليل الدراسات النوعية المتعلقة بالسياحة الثقافية المستدامة، بغية تحديد العوامل المساهمة في تطوير هذا النوع من السياحة. وستكون مدينة تلمسان نموذجا سامحا بتحديد العناصر المساهمة في إحياء السياحة الثقافية المستدامة.

الكلمات الدالة : السياحة الثقافية- التنمية المستدامة- التراث

الجزائري- تلمين - مدينة تلمسان

Introduction:

The supply of between one of the main pillars of the organizations contemporary, became the decisions taken on it is not a form of intuition, but became grounded on a scientific basis in the search, using a quantitative method in the characterization and measurement, analysis and evaluation, and this in order to reach more accurate decisions, which in turn, the efficiency of the supply network performance management⁽¹⁾. So those who enjoined the administration of hiring some of these sports scientific methods to rationalize their decisions, which are numerous in terms of capacity to address a specific problem.

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1-The problematic of research:

Given the importance of logistics within the organization it has been highlighted in this research on these methods and how to apply them in supply management, in the Algerian enterprises by answering the following problem:

How can the use of quantitative methods in decision-making concerning the management of The Supply Chain in Algerian Economic Enterprise?

Supply is defined as⁽²⁾ "the art and science of the flow of goods, energy, information and other materials such as products and services management⁽³⁾ and even humans from the production area to the market zone."

It refers to the strategic management process to store all materials, parts and finished products,⁽⁴⁾ the transfer of these elements from suppliers and from within the economic union facilities to customers. The objective⁽⁵⁾ of this activity is to provide an inventory of finished products, materials and parts required sizes, at the right time, the right place and in the condition to use and that the lowest possible cost⁽⁶⁾.

2-The objectives of supply: as the supply function within the master cells of the facility, it could be argued that there are two basic objectives: ⁽⁷⁾

- The goal of safety by ensuring that the provision of materials and supplies, which include good performance of the production process.
- The goal of cost and by ensuring that the proper use of the minimum of material that provides a cost to a minimum. ⁽⁸⁾

3-Materials and Methods:

Identify the role of supply as a function of the basic functions in the organization, and that the diagnosis of supply policy semolina own products within the "ALFORSANE" Enterprise in SAIDA Town for ALGERIA Country.

This enterprise does not have the function of supply as an integrated system, but the supply activities traditionally spread within the organization and in a range of key functions, and will be here to shed light on the reality of these activities in the organization:

3-1-Principal activities: available on: customer service, transportation, storage, information support system.

3-2-Supporting activities: are, demand forecasting, procurement function, handling, and packaging.

4-Mathematical formula to the process of conducting supply networks in this enterprise:

Evaluating the company's plan to full power operation of the plant through work for five days a week. And three shifts a day, with each shift of eight hours, which means that the weekly capacity of the plant is 432 000 seconds ($5 \times 3 \times 8 \times 3600 = 432000$). This in order to produce two product x1 and x2 (the semolina and Soft wheat).

- The time allocated for the completion of the first product X1 is 76 seconds, With respect to the second product X2 is 88 seconds. Director has put in front of him to try to achieve two objectives as follows:

« Put the institution in each year an annual scheme where it aims to achieve a net profit estimated 4159525 Algerian dinar, at least, and you want the enterprise that does not exceed the total costs for the supply of 3677441 Algerian dinar.»

According to the director of this enterprise and with the increased competition faced by the enterprise, it gives priority to the goal of minimizing the supply network costs while maintaining the level of profit and therefore the objectives are as follows:

- The first goal is the first priority objective: to minimize the costs of the supply network.
- The second objective is the second priority target: consists in maintaining the level of profit.

The cost price and the profit unitary for the enterprise's products is :

Variables	The cost price (DZA)	Sale Price(DZA)	The profit unitary(DZA)
X1	2280	3600	1320
X2	1285	2200	915

Source: prepared by the researchers based on internal documents of enterprise

The resources available to enterprise annually are :

The raw material	Quantity per unit		Annual consumption of raw material
	X1	X2	
Hard wheat	1.5		216000
soft wheat		1.6	140400

Source: prepared by the researchers based on internal documents of enterprise

We are dealing with multiple problems, goals, and therefore appropriate quantitative method to address these problems is a method of programming goals, and here we can formulate the objective function as follows:

General mathematical model preparation

4-1 - Hypotheses products: products to be linear programming application objectives it is:

X1: The quantity produced from semolina.

X2: The quantity produced from Soft wheat.

4-2 - Hypotheses resources available:

-Hypothesis of raw materials untapped: symbols used are the symbol E_i , where $i = (1, 2, 3)$

- The premise of the units of measurement: Kuntar use for producers semolina and Soft wheat.

Thus, the mathematical formulation of the problem of supply in enterprise using the programming objectives model is as follows:

As the first priority goal is to minimize costs, the objective has its own function are as follows:

$$\text{Min } Z = 2280X_1 + 1285X_2$$

This under restrictions imposed following:

$$\left\{ \begin{array}{l} 1,5X_1 \leq 216000 \\ 1,6X_2 \leq 140400 \\ 76X_1 + 88X_2 \leq 432000 \\ X_1, X_2 \geq 0 \end{array} \right.$$

The other objectives of enterprise that you want to achieve is posted in the following restrictions:

$$2280X_1 + 1285X_2 + d_1^- - d_1^+ = 36774411$$

$$1320X_1 + 915X_2 + d_2^- - d_2^+ = 4159525$$

This means that the mathematical formula for this problem by using the weighted goals programming model expressed as follows:

$$\left\{ \begin{array}{l} \text{Min } (z) = d_1^+ + d_2^- \\ \text{ST } \left\{ \begin{array}{l} 2280X_1 + 1285X_2 + d_1^- - d_1^+ = 36774411 \\ 1320X_1 + 915X_2 + d_2^- - d_2^+ = 4159525 \\ 1,5X_1 \leq 216000 \\ 1,6X_2 \leq 140400 \\ 76X_1 + 88X_2 \leq 432000 \\ X_1, X_2, d_1^-, d_1^+, d_2^-, d_2^+ \geq 0 \end{array} \right. \end{array} \right.$$

To solve this problem, we used the program WinQSB, which is considered one of the most used programs in solving the programming objectives model, which contains 19 small programs represents operations research models, which relies on the Windows program, it enables us to get results very quickly and accurately.

5-Results:

The results of the previous problem illustrated in the following table, which allows the decision maker in the enterprise's various decision variables related to the annual production level at the same time achieving the lowest total cost of supply and the greatest profit, restrictions and conditions of a respected enterprise.

Décision variables	Déviation variables	The objective fonction
X1=3151,16 X2=0	P1=0 P2=0 N1=29589778 N2=0	Z=0

Source: WinQSB program outputs

To achieve the net profit is estimated at 4159525 DZA at least and even the total supply of products enterprise costs do not exceed 36774411 DZA, the managers of the company must follow these production plan: the first product only X1 production, which is semolina and this by 3151.16 quintals of semolina, and not to produce any quintals of Soft wheat.

Compared to the results obtained through the modeling process with the information provided to us previously as the table shows:

	products		Cost (DZA)	Gain (DZA)
	X1	X2		
IDC forecasts	4608	1300	36774411	4159525
Proposed alternative	3151,16	0	7184644,8	4159531,2
Δ	1456,84-	1300-	29589766,2-	6,2+

Source: prepared by the researcher, based on the results obtained.

5-1-Note that:

If the institution following the proposed policy and productivity in the production of 3151.16 quintals of semolina they bear the costs of any 7184644.8 DZA only what is missing from the projected costs of a difference of 29,589,766.2 DZA, this compared to a profit of 4,159,531.2 DZA, any increase Gain is expected to 6.2 DZA.

This means that achieve the desired goals of the modeling process, where we have sought to find compromises that allow optimal exploitation of available resources and Co., Ltd., check the ruler and goals that are incompatible with each other.

As for the potential of untapped (Slack Variables), which can be exploited by the institution again:

- Hard wheat: quantity untapped (E1) equal to 168,732.67 (K).
- Soft wheat: quantity untapped (E2) is equal to 140 400 (K).
- Working hours:: Qty untapped (E3) equals 192,512.2 (SEC).
- This means that the institution has to exploit 47267.33 (K) of hard wheat,And not to exploit any quintals of soft wheat.

As for the shadow prices (Shadow Price) we note that all of them non-existent and this means that the addition of any quintals of these raw materials will not affect the objectives of the enterprise.

This confirms that the essential thing is important for the formulation of such mathematical models is the need to provide a solid database.

6-Sensitivity analysis

What is worth pointing out that often reach the optimal solution is not the end of the process that is used for which linear objectives programming, the maker cares decision to know what happens if the data that have been relied upon when drafting the original issue has changed, you may interested, for example, know the effect of the change in the level of ambition of the objectives or knowledge of the effect of changing the amount of raw materials available annually or effect of a change in the case of the emergence of a new product or know the effect of adding limitations or other output of the matter to the optimal solution obtained with other data remain unchanged, techniques for sensitivity analysis enables us to measure the effects of changes and take the necessary measures without re-issue of the New, and here we will focus only on the effect of the change in the level of ambition of the objectives as well as the effect of the change in the amount of resources because of their important role.

6-1-The impact of the change in the level of ambition of the objectives :

In this case we assume that the level of ambition of the total Gain or total cost of the supply change by unknown Let $\alpha \neq 0$, what is the area that remains the basis of the optimal solution obtained?

Even the perfect solution remains constant must be α belong to the following area: $\alpha \in [36774412, +\infty]$

Minor border in the sense that can take her ambition total cost of the supply 36774412 DZA level can be raised to at the end and this is always in the context of the rest of the other transactions stability hypothesis.

If we assumethat second goal and ambition of Gain level change by α with the stability of other factors, even the perfect solution remains constant must be α belong to the following area: $\alpha \in [4155525, +\infty]$

This means that the younger the border that could take the overall ambition level of Gain 4155525 DZA and can be raised to at the end and this is always in the context of the rest of the other transactions stability hypothesis.

6-2-The impact of the change in the amount of material :

Here we assume that the amount for a particular type of raw materials available annually may be changed by a specific amount and let α , what is the scope of change that keeps a constant basis the perfect solution?

If we assume that the amount of annual steel consumption of wheat changed by α and even remains the basis of the optimal solution must be constant: $\alpha \in [47267,33; +\infty]$

The same for wheat steel if changed by α and even remains the basis of the optimal solution must be fixed:

$\alpha \in [140400, +\infty]$

And all this in the context of other transactions stability hypothesis.

7-Evaluation of hypotheses:

Based on an analysis and diagnosis of the reality of supply in the organization results show respect to the first hypothesis, which states that the supply is to provide the appropriate item or service to the customer at the right time, the right place at the right cost, and research works to prove the theoretical side.

As the reality of the institution, the supply to serve my activity Supply, distribution and who themselves set within part of my job production and marketing . with respect to the second and third hypotheses explained the results of the study that the institution does not have the function of supply per se but exist under the guise of other functions.

The use of quantitative methods to make decisions within the institution of the important and necessary means leading to arrive at more accurate decisions, which reflected on the supply network management private and public enterprise performance.

8-Field research findings:

- The lack of culture and thought in logistical and economic enterprise.
- The presence of weak logistics providers as a result of the novelty of this concept in the national economy.
- Non-use of information technology in the organization.
- The lack of correct concepts of supply as a result of this and not to do research and simulation of institutions that are active in the same field.
- The presence of a weak international dealers in the field of supply as a result of lack or scarcity of supply services providers and the novelty of this tool, and non-proliferation only in developed countries.
- The study showed that the institution does not have the function as an integrated logistics, and activities spread over other functions.

On the basis of the results obtained it can be provided the following suggestions and recommendations:

- The provision of qualified labor through good training of human resources in the field of logistics and modern management methods, and the configuration on all administrative levels, through the use of information technology, communication and integration in the contemporary digital life.
- To keep pace with scientific developments in all of the terms of logistics concepts, techniques and tools.
- Encouraging investment in logistics by attracting customers for international logisticians.
- The integration of environmental considerations in decision-making, and applying global standards to preserve the environment.
- Coordination between the dealers and the working principle of joint and integrated logistics, and the development of relations with customers.
- The use of quantitative methods appropriate to take the appropriate decisions concerning the function of supply.
- The allocation of management or a special section on the level of large private institutions supply, and this is to help them to maintain their market position.
- Partnership with universities and so close the gap between the Algerian League and the reality of the job and economic institutions, and the survival of the latter in touch with what is new.
- To use the programming model targets a special feature, The goals have a role in determining the model parameters, can also be used to deal with the decision problems that include multiple targets (equal or contradictory) and according to the importance of these objectives.

9-Conclusion:

On the grounds that the logistics business in recent years has become a large and increasingly important for many business organizations, they lead to real added value, but that the institution does not have the supply as an integrated system, and does not rely on modern techniques to him, but we find that its activities spread over other functions within the enterprise, but this is not enough even to be interest in the supply being a job in itself, so the effective management of supply chains require a transition from management of total procurement activities stage. With the use of some quantitative methods in decision-making related programming goals as a way which is compatible with the problems associated with the management of supply, as a result of the multiplicity of objectives to be achieved so that the decisions taken are more accurate.

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