

APPLICATION MODEL FOR ASSISTANCE IN MARKETING DECISION

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Abstract: *Decision support systems are using models that take into account specific criteria for analysis and decision-making processes and build solutions that are evaluated and presented to the decision makers. Solve a problem of decision analysis is to identify the differences between the current state and the desired state of a business and establishing the necessary actions to resolve this difference.*

Key words: *decision support systems, decision analysis, models.*

Cod JEL: *L86,C88*

INTRODUCTION

Decision support applications in marketing are applications that provide support decision makers throughout the decision-making phase. According to Simon¹ decision-making process has four phases: intelligence, design, choice, review. These applications are based on models. A model is a representation of an actual system that allows analyzing the impact of possible decisions that may affect the system.

The paper presents a model application that uses decision analysis facilities available in Excel environment, allowing various simulations which respond to the question of how one can calculate a company's product mix so that to maximize company profitability.

MATERIALS AND METHODS

Practical the application is answering the question: how much of the product should be done monthly so that, ultimately, profits from their sale will be maximized. Solving the application requires correct identification of constraints (existing constraints), namely "we do not want to produce with more resources than necessary or to produce more than it can sell."

These restrictions will be introduced the command Solver from the menu Data, What If Analysis from Excel.

RESEARCH S AND RESULTS

The research was carried out on some company (hereinafter Pro Auto), which is active in the production of auto parts, has to choose between five products, each of which needs a certain amount of materials and labor.

¹ Simon, H.A., The new science of management decision, Prentice-Hall, New –Jersey, 1977, p.4

In Figure 1 you can see on the Quantity row we have highlighted the amount of labor hours required to produce a single product, on Materials row we represented how much material is needed to produce one unit of each product – product 4 requires 5 units of material to be created.

The unit price of the product is to be sold on row 5 and the cost associated with the production of it, on row 6.

Also in Figure 1 we have represented on row 8, Unit profit = Price unit - Variable cost

	A	B	C	D	E	F
1	Cantitate produse	210	120	90	85	300
2	Cod produs	101	102	103	104	105
3	Cantitate de muncă	4	5	8	9	7
4	Materiale	2,5	4,2	3	4	3,1
5	Preț unitar	8 lei	7 lei	12 lei	6 lei	3,50 lei
6	Cost variabil	4,50 lei	2,10 lei	7,70 lei	6,40 lei	3,20 lei
7	Cerere	4500	2300	7800	6300	1500
8	Profit unitar	3,50 lei	4,90 lei	4,30 lei	-0,40 lei	0,30 lei
9						
10						
11				Disponibil firma Pro Auto		
12	Cantitatea de muncă folosită	5025		3000		
13	Cantitate de materiale	2569		11000		
14						
15	Profit	1766				

Figure 1 Initial data model

From Figure 1 we can detail, namely for product 3, each unit made is sold with 12 lei, it has cost of 7.7 lei and a profit of 4.3 lei.

The capital of the company is represented by the amount of work and the amount of material used. In our case we have 3,000 work units and 11,000 units of material.

The amount of labor used for the 5 products is calculated by formula =SUMPRODUCT(B1:F1;B3:F3).

The amount of material for the 5 products is calculated by formula=SUMPRODUCT(B1:F1;B4:F4).

The question which the application finds an answer is:

How we allocate resources (labor and amount of materials used) as efficiently so that to maximize company profits?

The solution is given by Solver facility from Excel and figure 2 shows the corresponding window of this command:

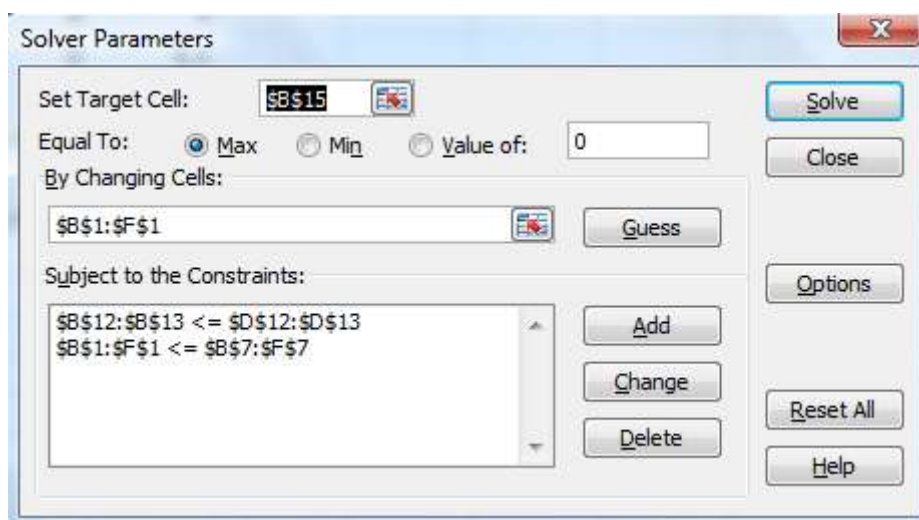


Figure 2 The Solver window

In this window shown in Figure 2 we must configure properly the fields of work, namely:

- - The objective function in our case is to maximize profits, in the section Set target cell we will write B15, and we will check the Max option;
- - Input parameters that are changing are the quantities of products, in the section By Changing cells section we will write B1: F1;
- - Restrictions that we put are:
 - labor and materials shall not exceed the maximum values available within the company: B12:B13<=D12:D13;
 - we will not produce more products than expected by the market: B1:F1<=B7:F7

The solution that we get, applying the Solve command from the window above is shown in Figure 3:

	A	B	C	D	E	F
1	Cantitate produse	0	600	0	0	0
2	Cod produs	101	102	103	104	105
3	Cantitate de muncă	4	5	8	9	7
4	Materiale	2,5	4,2	3	4	3,1
5	Preț unitar	8 lei	7 lei	12 lei	6 lei	3,50 lei
6	Cost variabil	4,50 lei	2,10 lei	7,70 lei	6,40 lei	3,20 lei
7	Cerere	4500	2300	7800	6300	1500
8	Profit unitar	3,50 lei	4,90 lei	4,30 lei	-0,40 lei	0,30 lei
9						
10						
11				Disponibil firma Pro Auto		
12	Cantitatea de muncă folosită	3000		3000		
13	Cantitate de materiale	2520		11000		
14						
15	Profit	2940				

Figura 3 The solution proposed model

From Figure 3 it emerges the following conclusion: for the values used in this application is made a single product, in a quantity of 600 pieces and through it is obtained the best profit of 2940 lei.

CONCLUSIONS

Solver is an optimization tool that offers more possibilities of simulation parameters which give rise to an optimal situation. Achieving optimal situation is done by changing automatically some parameters that lead to achieve its purpose, under the conditions of specify restrictions imposed under the model, so that optimal situation to consider these constraints or restrictions.

In conclusion, the facility Solver creates a virtual model on which we can work very quickly and efficiently.

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