



Substantiating the managerial decision regarding the introduction of an investment process in a rent a car company

*Fundamentarea deciziei manageriale
privind inițierea unui proces investițional
într-o companie de închiriat mașini*

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Abstract

The more and more complex economic phenomena, which appear on worldwide and national level, impose the use of some software products, capable to assist the decision factor in adopting some optimal decisions. Such software products are characterized by the use of a very complex economic-mathematical device, by means of which a series of real phenomena which generate a decision problem within the organization's framework can be formalized. The present article intends to approach a decisional situation confronted in a certain moment by a managerial team of a company which works on the renting cars national market. The decision problem consists in establishing the optimal structure of the car park, which the company intends to acquire by introducing an investment process, in terms of satisfying an optimization criterion, resulted from the general strategy of the company.

Keywords: *rent a car service, influence factors, linear optimization model*

Rezumat

Fenomenele economice tot mai complexe care se manifesta la nivel mondial si national impun folosirea unor produse informatice capabile sa asiste factorul de decizie in adoptarea unor decizii optime. Astfel de produse software se caracterizeaza prin folosirea unui aparat economico-matematic deosebit de complex, cu ajutorul caruia pot fi formalizate (conceptualizate) o serie de fenomene reale care genereaza o problema de decizie in cadrul organizatiei. Articolul de fata isi propune abordarea unei situatii decizionale cu care se confrunta la un moment dat echipa manageriala a unei companii ce activeaza pe piata nationala de inchirieri auto. Problema de decizie consta in stabilirea structurii optime a parcului auto pe care compania doreste sa-l achizitioneze prin initierea unui proces investitional, in conditiile satisfacerii unui criteriu de optimizare, rezultat din strategia de ansamblu a companiei.

Cuvinte-cheie: *serviciu rent a car, factori de influență, model de optimizare liniară*

JEL Classification: M31

Considerations regarding the managerial decision substantiation through software products for optimizing the decisional process

The complexity of the decisional problems, which occur at an organization level reveal the fact that, their solving through substantiation of some pertinent and efficient decisions is no longer possible just by appealing empirical methods or by exploiting the decider’s abilities and managerial flair. The more and more complex phenomena, the often uncontrolled modification of the competitive market parameters, the necessity of the organization’s adaptability and flexibility to the economic, social or environmental conjunctures impose the use of some computational products, able to assist the decisional factor in adopting some optimal decisions.

Such software products are characterized by the use of a very complex economic-mathematical device, by means of which a series of real phenomena which generate a decision problem within the organization’s framework can be formalized (conceptualized). In this context we can talk about an increase in the decisional process quality, by substantiating the managerial decision based on scientific methods and computational technologies.

The present article intends to approach a decisional situation confronted in a certain moment by a managerial team of a company which works on the renting cars national market, from the point of view of adopting an optimal decision, using the economic-mathematical simulation.

In this context, the article intends to realize a structured presentation according to the following steps:

- a) Presenting some characteristics of the rent a car service, as well as of the specific market for its development in order to know the particular context of the phenomena and processes which generate several decision problems within the framework of the companies which work in this domain.
- b) Identifying the most important influence factors of this service’s selling volume, with the purpose to offer an analyze frame of the company’s internal and external environment, in the context in which this one desires a rise of the market quote by beginning an investment in the extension of the car park.
- c) Conceptualizing the decision problem consisting in establishing the optimal structure of the car park, which the company wants to extend by introducing an investment process, with the purpose of determining the optimal decision regarding this process.

Characterizing the rent a car service and its specific market

The rent a car service imposes itself more and more at the worldwide level as an alternative to the transport with own motor vehicles. A series of conjuncture factors, which result especially from the deep transformation generated by the mondialization phenomena, led in the past decade to an important extension of the services sector and consequently of the rent a car one.

A first important aspect of the rent a car activity consists in the fact that, due to the general economic development, at national and worldwide level, this service is not dedicated only to the tourists, who need a car during their holiday, but it also intends to

satisfy the needs of the businessmen category, which mobility manifests during the whole year.

Another significant aspect which characterizes the rent a car service in general refers to the fact that this one is affected by any deep change in the structure and functioning of the competitive market. Thus, the appearance of new economic agents in the industry, commerce, constructions sphere etc, the accentuation of the competition, the rapidity of the selling processes and of the delivery ones, represent a big part of the factor which determine the companies to adapt and to revise their strategic options. In this measure, one of the “success’ keys” is determined by the capacity to ensure mobility to the employees, to the commercial representatives, who depend on possessing a means of conveyance, which seldom is an own one. After December 1989, renting a car became a well developed business in Romania too. At the beginning, the most often aimed target group was the tourists, but their share in the total of renting cars requests was reduced, Romania being a country with a low developed tourism potential. After the nineties, once with the growth of the foreign investments volume in Romania, a very well defined clients category was formed, made up by the companies staff who opened in Romania business representations, commercial banks etc. Remarkable is the fact that, for this category of clients, the rent a car companies began to offer associated services to the principal one, in species, renting office logistics (video projector, laptop, video camera etc), as well as journey logistics (anti-radar devices, GPS device, road maps etc), necessary to a business man passenger in town.

The car renting market is mainly formed by two companies categories:

a) International rent a car companies, which are part of the worldwide car renting system (*Avis, Hertz, Europcar* etc). These are organizations with tradition in the field, which operate in most states of the world, directly or through agents which are part of the respective brand. Their clients are usually natural persons or multinational companies.

b) National rent a car companies of small and medium dimensions, which serve the local market and which identified certain niches within its framework, this being the reason why they do not compete and are not strongly competed by the international companies.

It must be mentioned that, a rent a car company can offer besides the *short term rental* service the *long term rental* service. The second renting variant is usually preferred by the big companies within the project management. A multinational company which develops a project in Romania must ensure the project team the necessary infrastructure, including the transport one. The use of own cars is not justified for a time period of 8 calendar months on average, this being sometimes practically impossible from the point of view of a company with its headquarters on the American or Asian continent. The most efficient solution is the transport costs’ externalization through renting cars from the rent a car companies (long term rental), the beneficiary of this service being able to fiscally deduct all afferent expenses.

A brief analyze of the car renting market revealed the following significant aspects:

- *Clients, target market, market segmentation*

Within the market framework the following main segments were identified, whom a car renting company addresses to:

- Occasional tourist and clients – it is about natural persons who appeal to the rent a car services for some days according to their necessities. Therefore, a significant raise in the selling volume is being registered in the holiday periods.

- Insurance companies – in case that the car of an ensured person was stolen or seriously damaged, these companies place a car at the person’s disposal, obtained on the basis of some partnerships with the rent a car companies.

- Commercial companies – these one rent on short time one or more vehicles for their employees, who travel with professional aims in the country or abroad.

- *Delivering vehicles for the car renting companies*

In order to make up a car park, the rent a car company can mainly choose among the following ways:

a) Acquiring from the car distributors (internal or external) through the sale and purchase agreement. Few companies appeal to this solution, taking into consideration the fact that the financial effort is considerable, especially in the initial moment of starting the business.

b) Acquiring from specialized companies in a leasing system. Is the most often used solution, both among the national small and medium companies, and at the level of the big ones, due to the possibility of time grading the capital expenses in the course of the leasing period.

c) Making a bank credit which will be used for acquiring the car park. It is an option seldom used by the rent a car companies, due to the difficulties raised by the bank norms, but it can be used when a very small number of cars are acquired.

- *Investments imposed by the starting of the car renting service supply*

Generally, the investments volume and their realization directives are an issue bound to the company’s financial availability, to the development strategy it chooses, to the market particularities it addresses to and to a series of other objective or subjective factors. Nevertheless, the following few elements are necessary for starting and operating the rent a car service by a company:

- Investments for acquiring a vehicle fleet, whose number can vary from 30-200 for the small entrepreneurs, to about 1000 for the big companies. The structure of the car fleet (motor vehicles, utility cars, jeep, light trucks) depends on the market best presented target group, for which the company considers that it can reach a satisfying level of its turnover.

- Investments in ensuring a computational and communicational infrastructure, which includes both computational systems for the processes’ administration or electronic instrument board for the deciders, and clients relationship management electronic systems (the *Customer Relationship Management* type) or modern communication instruments.

- Investments in acquiring or renting a place for the car park, opening the working points especially in the airports and train stations areas.

- Ensuring a qualified staff, including the staff who ensures the handing – receiving the cars from the customers and the one who ensures the maintenance of the cars, office staff etc.

- *Marketing instruments*

The car renting sector is certainly one whose maintenance and evolution on the market is depending on the marketing activity. The success of a rent a car company can be associated with a famous affirmation by Philip Kotler: “*The rich companies have money because they make marketing, they do not make marketing because they have money*”. The particularization of such an affirmation at the car renting firm’s level is revealed in the fact

that, these ones must action in the direction of an *observation, understanding* and *anticipation* of the future customers' behavior, using the most adequate marketing techniques and instruments. Among these, two techniques detach as importance in the marketing domain, namely: the differentiation techniques, for ensuring a differential advantage both on the internal and on the external market and the positioning techniques through which the company identifies the best ways to position their services in the customer's mind.

Influence factors of the sale volumes at the car renting companies level

Taking into consideration, on the one hand, the dynamic of the rent a car market on the worldwide plan and on the other hand, the “youth” of this market at Romania's level, we can appreciate that the significant factors identification of the sales volume influence is an extremely important step which must be realized by the company. This thing permits both the formulation of theories regarding the future evolutions of the car renting services sales and the forming of some arguments for the managerial team, on the basis of which this one can make choices for realizing some investments.

We consider that it is necessary to take into account two main categories of influence factors, respectively the internal ones, which have a controllable character and are directly influenced by the managerial decisions made within the companies framework and the external ones, which have a more or less controllable character and which are under the social, economic, administrative and technological evolutions influence. The most important influence factors of the sales volume are the following:

Internal factors

- *Price politics* – represent an influence factor, both for the incomes attracted and for the realized profit. A representative indicator used in the specialized literature is RPU (Revenue Per Unit), which indicates the average annual profit obtained by using an unity from the own car park.
- *Dimension of the car park* – is strongly bound to the company's capacity to honor a request on the market and to ensure a wide cover on the market. Therefore, between this influence factor and the sales volume exists a directly dependent relationship.
- *Market experience and the managerial know-how* – it has been proved that in any business the acquired experience and managerial know-how influence the competition.

External factors

- *Economic factors* – include references to a series of indicators, like: tourism in business appreciated through the BTI index (Business Trip Index means of evaluation and comparative analyse of the degree in which the big towns can present destinations for the business trip (The Economist Intelligence Unit – Business Trip Index Methodology, 2008)), the regional brut internal product (PIBR), the number of economic agents which develop their activity on the market served by the rent a car company, fuel price, annual installment of the inflation.
- *Social-economic and conjuncture factors* – the capacity and activity of touristic accommodation (determined through the following five variables: existing

accommodation capacity (places), functioning accommodation capacity (thousand places – days), number of arrivals (thousands), number of night passing (thousand), net use index of the accommodation capacity (%), the intensity of the air transport, the situation of the road infrastructure etc.

○ *Technological factors* – mainly reflected under the position aspect of the rent a car company on the search engines in the internet network (google.com etc).

Formalizing the decision of extending the companies’ car park, through models of linear mathematics programming models. Case study.

The mathematic methods always played a role in management and economics, but their importance has been recognized only in the last decades. Thus, beginning with the middle of the last century, once with the proliferation of the concept “scientific management”, a series of studies have been realized regarding the appliance of mathematics in the organizations management sphere, one of the mathematic techniques developed after the fifties being the linear programming. In the decisional process optimization, the linear economic-mathematical models are the basis of some computational products’ development, which can be successfully used for the solving of some well defined categories of decisional problems.

Those situations are meant in which the decider has to adopt an optimal decision regarding the allocation method of the organizations resources, so that a certain economic criteria will be minimized or maximized (named optimization criteria), under the conditions of respecting a financial, technical, commercial etc. restriction set.

We suggest that, beginning from the mathematic model general form of linear optimization, to answer to the solving of a decisional issue which frequently appears in a rent a car company. Synthetically, the context in which we find the deciders premises and requests regarding the respective decisional issue is the following:

The car renting company functioned on the national market since 2005, beginning its activity with a car park formed out of 67 motor vehicles. The lack of practical experience in this domain determined the fact that the structure of the car park, divided in car categories and types, was not scientifically substantiated at the construction moment of the car park. In the course of 2005 – 2008 it has been observed that, the sales volume was not influenced by the total number of cars which were operating the service, but especially by the car types which were requested by the customers.

As a result of the fact that, the economic and touristic activity became stronger at national level in the past two years, the car renting request increased, both in the business sector and in the touristic one. Under these circumstances, the company decides to invest in extending the car park, determining to acquire through the operational leasing a number of 65 vehicle of different types (motor vehicles, motor utilities, jeep, trucks for transporting wares). Taking into account that the renting price is different according to the vehicle type and the renting time period, the car park structure should be severely substantiated, so that the general politics of the firm should be satisfied.

With these specifications, the decision problem identified by the companies’ manager can be expressed as follows: *establishing the optimal structure of the car park*

which will be acquired through the investment process, so that the economic index sales volume will be maximized, under the conditions of respecting a certain restrictions set.

Beginning from the general form of the economic-mathematical model, we are further presenting the formalization manner of the respective decisional problem, which represents the basis of a software product elaboration, used in substantiating a managerial decision.

An optimum function should be realized (also named economical function or objective function) of the form:

$$[\text{opt}] F(x) = \sum_{i=1}^n c_i \cdot x_i,$$

where

n = number of acquired cars

c = renting unit price of the car type “ i ”

x_i = number of cars of type “ i ” which are going to be acquired

In this acceptance, the function $F(x)$ represents the total volume of the sales, resulted from rent a car service supply, the vector $C=(c_i)$, with $i=1, \dots, n$ – represents through its components the indicators at the unity level, and $X=(x_i)$, with $i=1, \dots, n$ – represents the vector of the optimal car range. Thus, a component x_i signifies in the context of our example, the number of cars of a certain type, which can be acquired by the company, under the conditions of respecting the optimal criteria specific for the function $F(x)$.

For the given decisional problem, the following two restrictions sets are formed: a) framing each car group in the maximum available time fund (1); b) the companies’ financial and market restrictions (2).

(1) $t_{11}x_1 + t_{12}x_2 + \dots + t_{1n}x_n \leq d_1$ $t_{21}x_1 + t_{22}x_2 + \dots + t_{2n}x_n \leq d_2$... $t_{m1}x_1 + t_{m2}x_2 + \dots + t_{mn}x_n \leq d_m$	And	(2) $p_1 \leq x_1 \leq q_1$ $p_2 \leq x_2 \leq q_2$... $p_n \leq x_n \leq q_n$
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where:

t_{ij} = the time period in which a car type „ i “, from the car group “ j ” is rented;

$t_{ij}x_i$ = the total time period in which a car type “ i ”, from the car group type “ j ” is rented;

d_j = the maximum available time fund of the car group “ j ”;

p_i = the minimum number of cars type “ i ” which the company can acquire (according to its financial resources and market studies, which certify the customers’ preference degree for the respective car type);

q_i = the maximum number of cars type “ i ” which the company can acquire (according to the above mentioned restrictions).

Remarkable is the fact that, using the computational products based on the linear optimisation represents an important disadvantage, which consists in the substantiation limitation of an optimal decision to taking into consideration of a single optimal criterion. The practical reality proves that the most decisional problems suppose a finite number of decisional alternatives and economic (optimal) criteria and for their solving are appealed substantiation methods of the decision in multiple criteria conditions. This is why, in the context of the example presented in this paper, we consider that the accuracy and pertinence of the decisional process developed in order to justify the ground of the investment process, will be amplified if more economic functions are successively optimised, like: minimizing the total car park acquire expenses, minimizing the total time in which the cars in the car park structure are not functioning, maximizing the turnover etc. The solutions resulted through successive iterations of the linear optimization model can form decisional versions of the respective problem and they can be processed through an algorithm based on the fuzzy theory, in order to choose an optimal decisional alternative.

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