The use of modern management tools, a crucial factor to facing challenges

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Abstract: The transition from a centrally planned to a market free economy, confronts businesses to a competitive environment. The adaptation to this environment engages the managers to a continuous decision-making process. The quality of each decision, to a considerable extent is conditioned by the use of contemporary methods. An integral part of the contemporary methods consists of the mathematical, statistical and computerized methods, traditionally appraised for accuracy. The paper deals with problems concerning the importance of using contemporary methods and their extended use in managers decision-making. To the function of this objective hypotheses are formulated from the expert and manager perspectives. The hypothesis verification is reasoned to be performed with the use of non-parametric statistical method – the Mann Whitney criterion. The geographical criterion targets are the major cities such as Tirana, Durres, Shkodra, etc, since they constitute the main centers from the economic, cultural and scientific perspective.

Keywords: decision-making, contemporary methods, Mann Whitney criterion, effective direction.

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1. Introduction
All leaders, whether operating as individuals or united in a society, the managers of each business require efficiency concerning the use of material and financial resources at hand. To this main end, are included or permanently involved in the decision-making process. The decision-making process incorporates objectives, personal and general interests, passions and thrills which preliminary pass through a brainstorming process with regard to the posed objectives and the coordination of various interests to addressing the challenges. From this perspective, the decision-making process is not merely a managerial commitment, but also an individual, group, or family engagement. According to this relevance, the decision-making process focuses on problems of diverse nature. Therefore the problems, the type and method of decision-making are different. Despite that, whatever the type or scope of human activity where decision-making is needed, in each case they focus on one or more of the following issues:

- Definition and goal/priority setting of aimed targets.
- Program implementation.
- Timely reflection regarding the constant economic and social changes.

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Focusing on the on-going different business practices, it is evident that the decision-making process is thoroughly widespread and highly substantial. Decision-making is also a core issue, an important intellectual commitment, highly responsive in order to attain risk protection. Each decision-making case is significant as it refers to a case raised for solution, but the decision-making of business organizations bear a particular significance as on the one hand they it strives to meet customer requirements and in turn to meet their business objectives and maximize profits. Therefore, the business organizations decision-making deals with various problems as the business type, the definition or change of location, the organizational culture, the typology, the managerial structure of the organization, the composition of the management team, its employees, the type and quantity of products produced, the indispensable inputs, the limited term of supply, etc. The above issues diversity the decision-making process focuses on revealing the fact that decision-making demands strong reasons and is an integral part of the managerial responsibility. Consequently the business organizations decisions are led by the economic logic, a requirement stipulating the use of effective methods and techniques that ensure accuracy. Businesses run their activity guided by decisions that undoubtedly constitute a commitment and a crucial managerial responsibility. The success of each business is dependant on the decision-making quality and the latter is subject to the method used in decision-making. Generally the decision-making methods belong to two main groups. These two groups are:

- Manual methods, which rely on personal intuition.
- Modern methods, we can distinguish the mathematical methods and their correspondent models, due to their superiority in comparison to other methods.

Therefore this paper aims at pointing out some problems regarding the use of modern methods in the decision-making process.

Decision making is a difficult entrepreneurship influenced by numerous factors varying in nature and intensity. Often decisions can be made when the goals may be challenging, competitive and conflicting. Taking into consideration the above-mentioned factors, regarding simultaneously the manual methods is difficult and in some cases impossible, thus decision-making has not always proved successful.

The mathematical methods are evaluated as generating precision and speed in decision-making. Obviously the first question raised in this case regards the rate of use of these methods in this substantial activity by the members of management teams who run the businesses. According to the previously performed empirical research, the degree of use of the mathematical methods is estimated to be at the lowest limits of use. In this context, the paper engages in touching upon one of the still pending questions, namely: **Why Managers do not use the mathematical model in the decision-making process?** The still unsolved question sets in focus two problems. On the one side it poses the definition of the extent of use of the mathematical methods in decision-making and on the other side it defines the conditioning motives of the scale of use of the mathematical methods by the managers. By studying this issue in-depth, in order to answer this question, we hope to obtain ways and possibilities to apply the mathematical methods in the future. Referring to the manager, the low using-rate of mathematical methods in decision-making can be explained by the following reasons:

- Lack of legacy: the Albanian managers have not inherited any experience in this regard. The centralized management of enterprises by the state through the ‘unique state plan’ has not enabled the managers to be engaged in creative activities such as decision-making.
- The indispensable degree of available skills in order to engage in this kind of activity.
- The evaluation level of mathematical methods by the managers.

Managers are the professionals confronted more to decision-making. In this regard, despite the opportunities, they are interested in using the advanced methods. But the hypothetical confirmation of this fact is a necessity, in order to turn into a conviction this empirical assessment, which would help to improve
the future performance. To this cause, was aimed at studying the attitudes of the two actors are associated to this issue. Therefore the problem was studied at:

- the expert level
- the decision-makers level (managers)

Thus, in accordance with the above problems, the specific relevant hypotheses were designed:

**Firstly**, the hypothesis concerning the experts focuses on the problem of the differentiation between the manual and the mathematical method, which was thus formulated:

H₁: The decision-making based on manual methods in practice does not provide an accurate solution.

**Secondly**, the hypothesis referred to the managers’ focus on the problem on the perspective of their willingness to use these methods. This hypothesis was formulated as below:

H₂: The managers lack the indispensable training in order to use the mathematical methods.

### 2. Methodology

The methodology makes feasible the achievement of the paper in order to meet the objectives set:

- **Table work**: focuses on research on the relevant economic literature and data collection available from documentation of various institutions such as line ministries, the General Directorate of Taxation, INSTAT (Institute of Statistics), etc. and other actors, data processing and conclusion drawing.
- **On the ground work**: on the ground research and analysis focusing on the two denoted groups the experts and managers, the preparation of two types of questionnaires and interviewing. The necessary data to conducting the study were obtained by the questionnaire prepared to this purpose.

The hypothesis verification takes into consideration the requirements of the Mann Whitney procedure, respecting the specifications of the denoted groups. Thus the hypothesis directed to the experts will consider the requirements of this procedure to the **minor choices** (less than 10 choices) and the one addressed to the managers, will consider the requirements for the **major choices**, with a choice number of over 10.

The study covers three Albanian speaking countries, namely Albania, Macedonia and Montenegro.

### 3. Results and analysis

In accordance with the methodology, the samples referring to the experts included academic and freelance experts. Each of them was asked to assess by points on a scale from 1 to 10 (the upper limit 10 represents the upper extreme, which assesses at maximum the scale of accuracy lack) the answer: Do you believe that decision-making based on manual methods fails to provide an accurate solution? Point rating of the survey is illustrated in the following table, making possible to assess the hypothesis raised to that purpose, according to the Mann Whitney criterion.

<table>
<thead>
<tr>
<th>Points Rating</th>
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<tr>
<td>Choice I</td>
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<td>Choice II</td>
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In accordance with the Mann Whitney criterion to the ‘minor choices’, the above-listed estimates are lined, maintaining the choice affiliation (in our case the maintenance of choice affiliation is accomplished by means of underlining) as follows:
Furthermore the Mann Whitney procedure proceeds in this turn:

- The data obtained by the above survey is lined. We determine the level of importance $\alpha=0.05$ (thus 95% certainty).
- The total amount of selection ranks of the first choice and their average is estimated.
  
  $$R_{1M}(\text{sum of ranks}) = 3 + 6 + 7 + 8 = 24$$
  
  $$\text{Average-MR} = \frac{1}{2} \times n_1 \ast (n_1 + n_2 + 1) = \frac{1}{2} \times 4 \ast (4 + 4 + 1) = 18$$
  
- Compute the deviation from the squared average of the Mann Whitney criterion.

  $$\sigma = \sqrt{\frac{1}{12} \times n_1 \ast n_2 \ast (n_1 + n_2 + 1) = \frac{1}{12} \times 4 \ast 4 \ast (4 + 4 + 1) = 3.4} \quad \text{(SR1)}$$

- Compute the indispensable $Z_f$ to be compared with $Z_{kr}$

  $$Z_f = \frac{(R_{1M} - \text{MR})}{\sigma}$$

  $$Z_f = \frac{(24 - 18)}{3.4} = 1.76$$

From the table of the normal distribution $Z_{kr} = 1.96$.

Condition: If $Z_F < Z_{kr}$ the hypothesis is confirmed, and vice versa. Specifically: $1.76 < 1.96$ thus the hypothesis is confirmed.

In order to strengthen the conviction to this problem, in the study we made a reiteration by utilizing a sample including other individuals (experts) following the same proceedings. In this case the same phenomenon is observed. Despite the figures change, the trend remains equal. In both cases the hypothesis is confirmed.

### At the managerial level

So far 36 managers have been interviewed; out of which 25 operate in businesses in three cities of Albania, respectively 12 in Tirana, which is the largest economic center of the country, 10 in Durrës and 3 in Shkodra. The rest in the other regions, respectively 6 in Macedonia and 5 in Montenegro. The majority of the respondents 85% are male, while 15% are female. The interviewing was conducted in accordance with the face-to-face methodology. The data was processed by means of the Microsoft Excel program.

From the data processing resulted that up to this moment the interviewed managers at 100% make use of the manual method in decision-making. Generally they hesitate to answer the question: “Are you assured in carrying the decision-making using this method?” Thus 56% abstain in providing a response, because of two reasons:

- The managers are not duly acquainted to another efficient method of decision-making.
- They are adapted to the traditional method and are reluctant to change it.

However, these results cannot be considered representative, not only because of the low number of surveys, but also due to the fact that a considerable number of foreign businesses operate in Albania, where managers are Albanian, thus hopefully they will enable the change of these results.

The data collected from the further escalation of the questions addressed to the managers, an integral part of the study sample until now, show the following results:

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<tr>
<th>Points</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
<td>Rank</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
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</table>
As shown by the summarizing table of survey results, the use of mathematical models in decision-making for a certain timeframe in the future, will encounter difficulties, which is supposed to be caused by the below factors:

Firstly, the level of manager preparation in the field of mathematics.

Secondly, the willingness to take risks in this course.

Thirdly, the support provided to the manager’s initiatives in the use of mathematical models by the entire management team, including the owner, which at considerable times are skeptical in this regard.

By comparing the data acquired amid the studied districts, is observed that the relatively more positive indicators so far are registered in Tirana, which being the capital of Albania is simultaneously the more developed educational and cultural center. The promising indicators resulting in Shkodra, are due to the small number of the interviewed managers. These results were also affected by the fact that one of the respondents is an owner-manager who studied in the USA and worked there for a considerably period of time. Actually he proves to be a successful manager. The situation is thought to change by the increasing number of respondents in the city in the follow-up of the study. While the city of Durres displays average indicators regarding almost all the sections.

The current data regarding the businesses surveyed in Macedonia and Montenegro are promising so far. But it should be emphasized that the number of respondents is relatively low, namely 6 and 5 managers engaged in different businesses. Based on these data (on comparative terms between the two countries) it can easily be noticed that the situation remains more positive in Macedonia, though not in considerable proportions. The interviewed businessman in both countries are interested in utilizing the mathematical methods, but the involvement potential in this activity remains limited, mainly due to the lack of training in mathematical sciences.

The above results do not envisage an optimistic situation. According to the results of the interviews, we can conclude that the managers still remain unclear on the use of mathematical models in decision-making. The managerial engagement in this course should consist on defining the model to be used, and not in its choice.
4. Conclusions

By screening and monitoring of the decision-making problem in the three states of object-study, we can amount in the following conclusions:

- Managers are involved in the decision making process and remain concerned to the quality, regardless of the method they more commonly use in decision making.
- The fact that using the mathematical models takes into consideration all the factors influencing the decision making is known. This is specifically pertinent to this method. It provides a scientifically based decision making, fast and of low cost.
- However up to now, there is a pronounced lack of use of the mathematical models in decision making.
- Although managers appreciate the importance of using the mathematical models, they lack getting engaged in this regard as they face difficulties in the practical implementation due to the problems concerning the mathematical apparatus they possess.
- Utilizing the modern methods in economic decision-making preserves their economic character, as the path it provides is mathematical, while the logic is and remains economic.

Given the ponderosity of the mathematical models in decision making, we consider it viable to make some suggestions:

- Managers should orient their activity towards modernizing their business activity, which is achieved through making use of the modern methods in decision making.
- Should be obvious that managers are required to define the model. Nowadays a variety of software can enable the solution resulting from the selected model of the manager.

5. References

[1] Data from the Institute of Statistics.
[4] Data provided by the three denoted-state groups questionnaires.