Research on decision support systems in the current economic context

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Abstract: *The complexity of economic activities in terms of the competition imposed by the current economy acts to increase the role of economic-financial information in decision-making. The quality of information is paramount for the quality of current and long-term decisions, and therefore for the entity's forecast results. In this article, we intend to perform an analysis of the usefulness of the information provided by the accounting department in decision-making processes. The research typology employed in this article is the Qualitative Field Study type, which involves a data collection process, and then the employment of research methods pertaining to qualitative research (the questionnaire). To achieve this goal, we conducted our research in two directions, achieving both fundamental research and applied (empirical) research, based on a questionnaire addressing enterprise managers at different decision levels, inquiring the usefulness of accounting information in the decision-making processes.*

Keywords: decision support systems, decision-making processes, accounting.

JEL Classification: G 34, M 14

1. The current state of research

Generalised uncertainty, a phenomenon that managers of today deal with as part of their professional life, makes it impossible to project how the environment will develop or what consequences potential decisions may have. *According to several empirical studies, (1) effective managers are moving away from the*

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traditional decision-making process (i.e. one that involves primarily rational analysis) and compensate for any limitations in time and information by relying on intuition. Both the literature on the subject and management practice testify to a growing interest in intuition, a concept that as recently as a few years ago was treated as unscientific, even mystical. In any decision-making process at entity as level, a sum of economic, technical, legal, human and managerial variables are concomitantly involved. The development and adoption of a decision represents the result of decision making activities carried out by the decision maker, eventually assisted by a decision-making support team and/or a decision-making support system (SSD). Managers from all organizational hierarchical levels are the direct beneficiaries and users from the decision-makers´ subclass of the decision support systems. Decision in general and managerial decision in particular, due to increasing complexity and contextual determination, is associated to numerous risks. Ronald A. Howard in "*Speaking of Decisions: Decision Precise Language*" recommends discarding the manner in which it is made nowadays the distinction between the meaning of the terms: risk and uncertainty. At entities´ level, concern is manifested towards the implementation of risk management in order to help increase objective´s plausibility, to improve the stakeholders confidence, to increase operational safety and health performance, as well as environmental protection, to minimize losses, to improve organizational resilience aiming to minimize the negative impact on the organization and the need of a solid basis in decision making.

Numerous studies have demonstrated the necesity to develop decision-making models, based on human cognitive processes; for example, also see Azuma et al. (2006) and Endsley et al. (2007). Moreover, it is felt the need to develop decision-making models that can describe peoples´ risk attitudes from a systematic point of view (also see Power and Sharda (2007), Parker and Fischhoff (2005), Miller (2008); Betsch and Kunz (2008) also see Kahneman and Tversky (1979), Lopes (1997) Kull and Talluri (2008)).

Our research starts from an idea found in an article by Robert Briker, where the author discusses the vision discrepancy between accounting practitioners and accounting theorists, in that *the former believe that accounting theorists have gradually lost interest in accounting practice, while the latter consider that the practitioners' interest is defined by too narrow a horizon* (2). Our opinion is that an estrangement of theory from practice and vice versa can only lead to a limitation in satisfying the users' need for financial-accounting information. The main means of transmission of financial information provided by financial accounting is the financial reporting; the information disseminated by them is derived from the representation of the entity's economic reality, using a specialized language, as well as specific rules and principles.

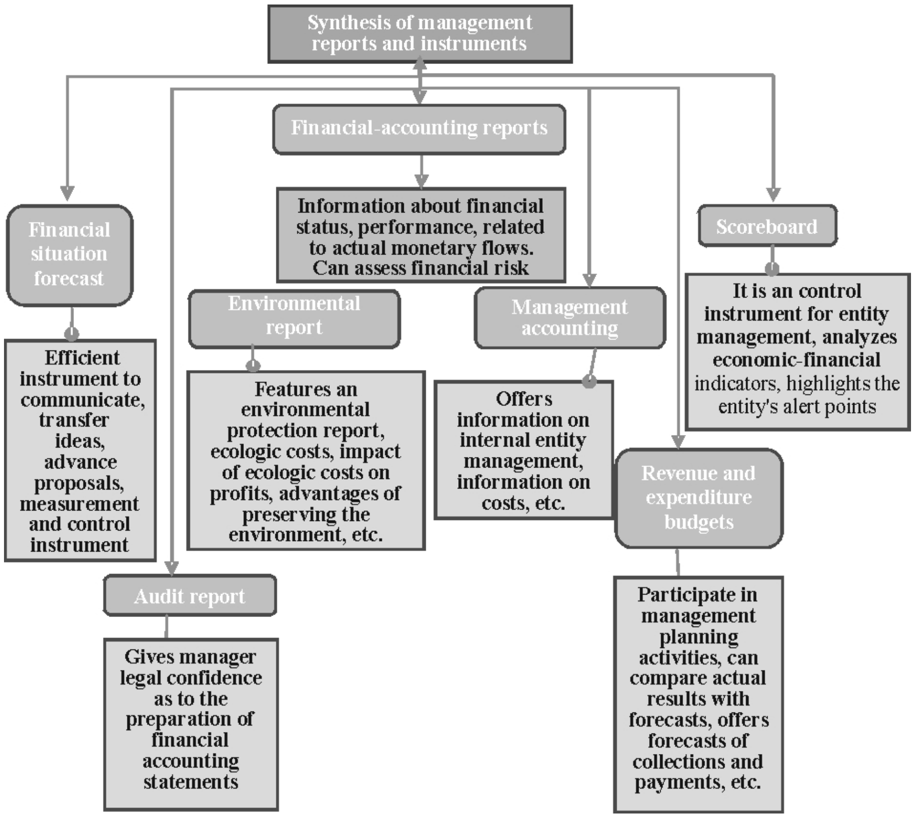
The objective of financial-accounting informing, for internal or external use, is to provide accurate information that facilitates understanding or knowledge of economic facts and situations, adapted to producing an objective assessment, useful for utilizes in their decision-making, providing information: necessary for economic decision-making; to assess economic activity of business unit; actual and potential monetary flows; assess and compare the performance of business unit; on how to effectively manage resources of business unit; about business unit activities that can be described and measured.

In the figure above we schematically displayed some of the tools that a stakeholders can rely on in the decision-making process. The basic function of any economic information system, no matter its complexity, is to produce information on which decisions are made. Before any reference to accounting, we could mention the opinion of information systems specialist, Marshall Romney, who stated that the accounting information system is made of *"people, processes and information technology"* (3). The system's mission is to fulfill three functions, as follows:

- collecting and storing data about transactions, so that the organization can document their history;
- processing collected data and obtaining useful information for the planning, execution and control of organization activity;
- providing appropriate means of controls to safeguard the organization's assets, its "wealth of information" included.

The Romanian accounting information system is organized in a dualistic manner: f*inancial accounting and management accounting* – both record events in the economic life of the entity that they quantify according to monetary standard, providing information to interested users. However, different informational needs of internal and external users determine the existence of significant differences between management accounting and financial accounting.

Figure 1. Instruments used in substantiating decision-making



In this paper, we aim to use a research strategy appropriate for achieving the goal and the objectives of the proposed theme. The research strategy used in this paper is dominated by certain methodological aspects of the approach, namely:

- *Inductive (experimental, quasi experimental, observational) and deductive;*
- *Comparative and non-comparative;*
- *Case studies and questionnaires for the study of mass phenomena (statistics);*
- *Qualitative and quantitative.*

For the achievement of the scientific research´s objectives, we conducted research activities in two directions, using both fundamental research methods, as well as applied research. The purpose of this research is to provide pertinent scientific conclusions that help to the improvement of the relationship between the producer and the beneficiary of the accounting information, to the improvement of financial reporting, as well as to the increase of the degree of relevance, accuracy and comprehension of the information included in the financial-accounting reports.

2. Information system and decision-making system

In terms of their economic and social utility, the information and computing systems within an organization are nowadays legitimately recognized, given the transformations generated by the evolution of globalization, and the constraints and opportunities offered by a competitive environment.

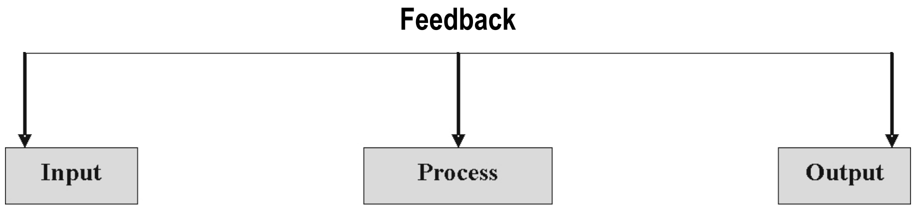
Over the period, the information system has been defined by several prominent authors. According to R. Reix, an enterprise information system (4):

- consists of a set of means and procedures for identifying, processing and dissemination of information;
- aims at providing various members of the company with information in a directly usable and opportune form, ensuring support for the development of the company's operations and decision-making at various levels

According to A. Ţugui, the information system stands for "*an ensemble of technical and information means targeted at/specialized in collecting, processing, storing, accessing and transmitting data and information about the processes taking place within the perimeter of an enterprise*" (5). If all these operations refer to business processes undertaken within a given enterprise, we can discuss about the economic information system of that company.

Ralph. M. Stair and George W. Reynolds believe that the information system is a set of elements or components for the collection (input) and manipulation (process) of data and information, providing a feedback mechanism in order to achieve objectives (6):

Figure 2. Components of the information system



Source: Ralph M., Stair, George W., Reynolds, Fundamentals of Information Systems, Third Edition, 2006, p. 7

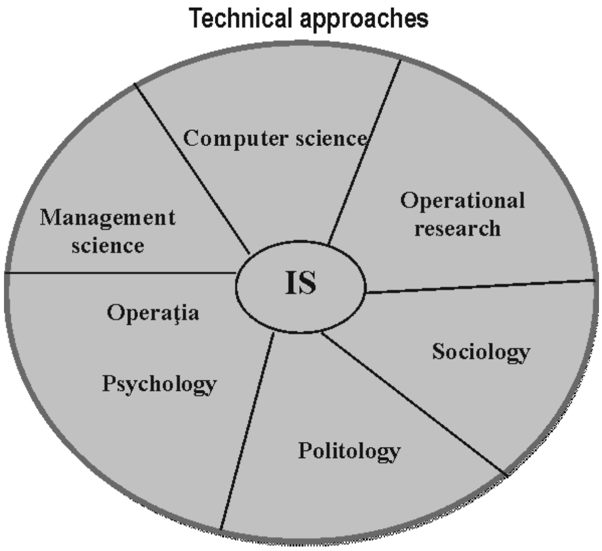
James O'Brien distinguishes between several perceptions of information systems by users-managers (7): an essential functional service upon which depend the company's operation and development, sharing equal importance with compartments such as accounting, finances, production management, staff and marketing; a significant part of enterprise resources and operating costs; a capital element influencing operational efficiency, productivity, personnel motivation, as well as customer support; an important source of information and support for managers in making the best decisions; a key ingredient for the development of competitive products and services that will confer the company a strategic advantage in domestic and international markets; stimulating and dynamic careers for millions of people.

O'Brien thus considers the information system "*as an organized combination of people, equipments, software, communications networks, and data resources that collects, transforms and distributes information in an organization*".

According to Vasile Anton, an information system is an integrated set of methods, procedures and tools used for the collection, transmission and data processing, analysis, storage, dissemination and exploitation of information and knowledge (8).

Peter Keen states that the field of information systems in economics represents a fusion of behavioral, technical and managerial elements (8):

Figure 3. Approaches to I.S. in economics



Source: Keen, P.G.W., MIS Research: Reference Disciplines and a Cumulative Tradition, Proceedings of the First International Conference on Information Systems, 1980

Defining the concept of information system assumes different expressions, as it is widely accepted as a structured set of elements that provide information to those interested. Metaphorically, we can associate this system with the bloodstream of living organisms that provides collection, treatment and distribution of blood to other organs.

3. Accounting and its role in decision-making

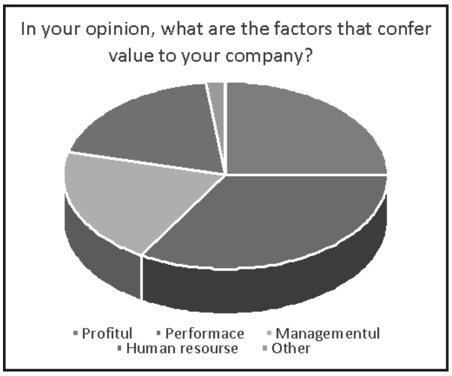
Before presenting and interpreting the study conducted on how managers and the persons involved in the decision-making appreciate accounting information, we believe it is necessary to explain, in short, the reasons why we turned to empirical research.

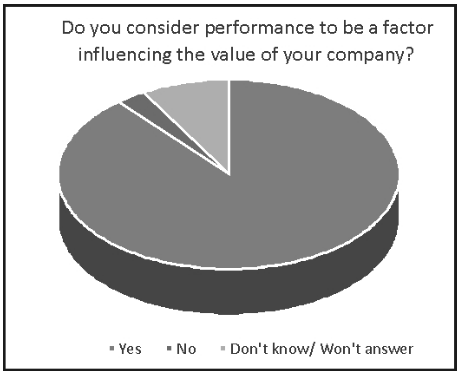
Empiricism (from Greek εμπειρία: *test* or *trial*) is the philosophical doctrine of testing and experimentation, and acquired the more specific meaning that all human knowledge comes from the senses and from experience. Empiricism rejects the assumption that people have ideas they have been born with, or that anything can be known without reference to experience.

The most widely used method of obtaining primary data is the survey. The method implies the existence of a questionnaire and a representative sample of the population under consideration and was chosen in the present research as well. Sample components were contacted directly. In this case, the sampling problem becomes a distinct phase of research. This involves establishing the people who will be subject to research and identifying the sampling frame or base from which to choose the sample units when probabilistic sampling methods are employed. In our case, the sampling unit is the managers.

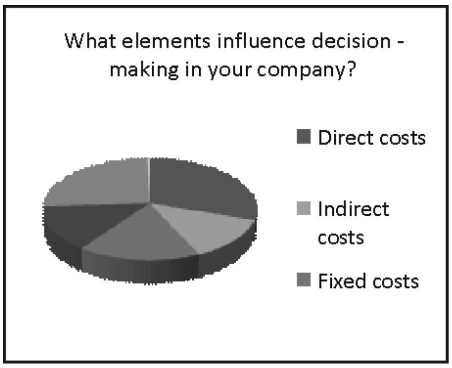
Surveys were conducted by visiting those economic entities that responded positively to our requests and included companies of the LLC (Limited Liability Company) and Inc. (Joint-stock company) type, as well as public entities (municipalities and autonomous administrations).

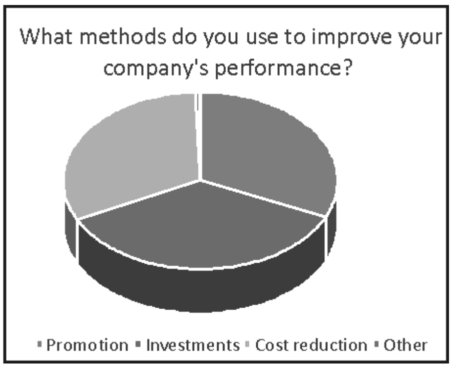
The geographical area includes businesses in Suceava County and Botoşani County. The questionnaire we drafted contains 31 questions; in this article we will present the most relevant opinions of respondents. We tried to find the optimal formula that does not bore the respondent and does not take a long time (the optimal time to maintain respondents' interest is considered to be 5 minutes to fill in the questionnaire), while, at the same time, granting us access to information necessary in achieving our objectives. The responses we received after transmitting this questionnaire via email and direct contact were centralized using a statistical program SPSS (Statistical Analysis Software), which allowed us to easily centralize analysis information and then draw conclusions. Centralization included 300 questionnaires considered valid according to statistical research methods. We sought to take into account all possible conditions to ensure response maximization.



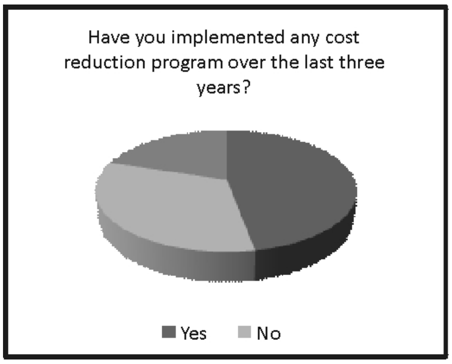


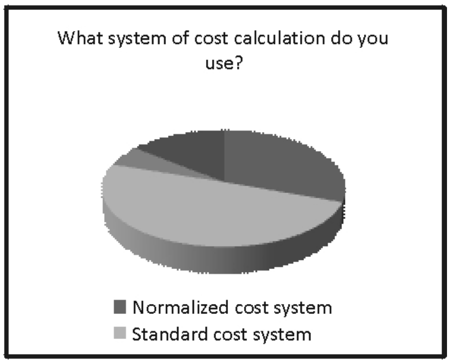
In our research we wanted to see how our respondents define added value when referring to their own organization. This resulted in the 33.5% who associate added value with performance, respectively 25.8% who associate it with entity profit. Some of our target group answered that added value stands for the management, i.e. 20.5%. Performance is considered a high-influence factor in market value, as shown by 88.8% of those who responded to the questionnaire.





We tried to find out which spending component in an entity holds the largest share in the decision-making process of organizations, when we refer to a particular reporting period. Thus, direct costs have a share of 30.2%, while fixed costs hold 16.8%. Setting the selling price of their own goods and services has accounted for 25.6% of the time taken for decision-making at entity level. Performance represents a concern for all studied organizations: it is not only about obtaining a positive financial result but also about access to certain economic resources and to the entity's ability to generate cash. Performance can be achieved through investments (35.9%), cost reduction (31.8), and promotion (31.8%).





Under the double effect of competitive pressure and diversification of demand, companies today feel the need to better know their costs. Many companies have already implemented programs to reduce costs, more precisely 47.1%. Cost calculation systems can serve both firms that offer a single product/service, and companies that offer individual products for each client (software companies, for instance), as well as companies offering hundreds of products every day. Thus, 49.6% of economic entities use the standard cost system, 30.5% the normalized system cost, and 5.7% the budget cost system.

Table 1. Factors that influence investment decision

Relevant elements in investment decision-making (%):	(5)	(4)	(3)	(2)	(1)	Total
Instinct	12	12.5	12.5	25.5	**37.5**	100
Market condition	10.5	18.5	20.5	**31.5**	19	100
Business plan	**42.3**	22.6	16.3	10.1	8.7	100
Acquired experience	22.9	**35.2**	27.1	10.5	4.3	100
Accounting financial reports	**30.9**	25.9	24.5	13.8	4.9	100

Note: (5) to a very large extent, (4) to a large extent, (3) to some extent, (2) to a small extent, (1) to a very small extent

The results of this inquiry allow us to visualize the maturity and experience of business managers. Thus, we may conclude that there is a business environment which is increasingly turning to a business plan (42.3%) and to accounting information (30.9%), which shows that, although not all those interviewed have read basic economics, managers make use of these reports and information in decision-making. However, we can not overlook the fact that there are managers who consider instinct and personal experience as means of assessing economic reality (12% and 22.9%, respectively).

Table 2. Factors that influence accounting information quality

Factors that can affect accounting information quality (%):	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**	**Total**
The existence of several accounting treatments to reflect transactions	12.1	25.8	23.6	**31.9**	6.6	100
Accountants' lack of experience	**47.4**	19.9	18.9	13.3	0.5	100
Political changes at central (taxation) and local level	**30.9**	27.3	28.4	9.3	4.1	100
Pressure put on accountants by owners	14. 0	22.3	**31.5**	19.6	12.6	100

Note: (5) to a very large extent, (4) to a large extent, (3) to some extent, (2) to a small extent, (1) to a very small extent

Lack of experience in accountants is considered the main cause that negatively impacts the quality of accounting information (to a very large extent, according to 47.4%), followed by changes in taxation (30.9%). This situation could be solved by using the services of specialized companies or by outsourcing. These companies enjoy the presence of well-trained human resources, have access to advanced programs, managing risk at reasonable level. First, in order to be effective, financial and accounting information should always be updated, simplified, while being presented as suggestive as possible, and using terminology appropriate for management knowledge that helps economic forecasting, etc.

Table 3. Reports and analyses used in decision-making

Importance of accounting indicators provided for managers (%):	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**Total**
Asset structure analysis	15.8	15.3	**19.2**	15.3	11.3	7.9	8.5	2.8	3.9	100
Financing sources structure analysis	12.4	**18.4**	17.3	13	15.1	11.4	7.6	4.3	0.5	100
Liquidity and	28.2	**33.1**	10	10.5	7.2	5.3	3.3	0.5	1.9	100

Importance of accounting indicators provided for managers (%):	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**Total**
solvency analysis										
Analysis of financial balance (working capital fund, needed working capital fund)	**19.5**	18.3	13.7	12.6	17.1	13.1	2.9	1.7	1.1	100
Intermediate management balances	6	8.4	9.6	10.2	13.9	15.1	**17.5**	15.1	4.2	100
Revenue and expenses budget	**45.6**	18.6	6.9	8.8	4.4	7.8	4.4	1	1	100
Cash-flow	21.6	**16**	14.4	11.3	6.7	6.7	12.4	9.3	1	100
Scoreboard	4.6	11.8	7.8	4.6	7.2	3.9	11.1	**32**	16.3	100

Note: 1 means first in importance; 2 means second in importance, etc.

Given the current economic situation of our country, an important role must be held by information on liquidity (19.5%) and of course by a close following of the revenue and expenses budget (45.6%). We believe that these reports, together with market research, rigorous marketing, three scenarios budget, inventory optimization, contract renegotiation with customers and suppliers, constitute measures that should be adopted by Romanian entities in order to manage the effects of the financial and economic crisis. Presentation of such information may vary depending on several criteria: from verbal communication that answers certain questions likely to be asked by managers or shareholders to various reports for managers or to the financial statements for external users.

Table 4. Factors that positively influence decision-making

Factors that affect decision-making (%):	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**	**Total**
Interactive use of accounting management system	**48.6**	19.9	16.2	6.0	9.3	100
Use of non-financial information of accounting management system	9.9	**36.1**	31.7	18.3	4.0	100
Enhancement of regulations for personnel conduct	8.2	20.8	**39.2**	24.6	7.2	100
Encouraging employees' participation in decision-making	13.1	**32.7**	23.5	22.2	8.5	100

Note: (5) to a very large extent, (4) to a large extent, (3) to some extent, (2) to a small extent, (1) to a very small extent

The cornerstone of an entity's success lies in its ability to identify (forecast) the sources of value creation and exploit them accordingly. Value is appraised from the viewpoint of products and from the viewpoint of the organization as a whole. *Financial accounting* is based on reporting to the outside. It quantifies and registers economic operations and provides financial statements prepared under generally accepted principles of accounting. Thus remuneration of entity management is often directly conditioned by the information contained in these financial statements.

4. Conclusions and proposals

This study was possible thanks to the help we received on the field from the firms that responded positively to our research. Although we aimed at meeting all conditions to ensure a maximization of response degree, this degree was only 70% (the sample counted 500 entities). In the study we carried out, even if we could not extrapolate the assumptions made by and the information received from the responding firms, we used this information to construct a more complete picture about the usefulness of financial accounting information in the substantiation of decision-making. Through our research, we studied how the theoretical elements that are specific to the financial accounting field are reflected in the managerial practice of economic decision-making.

As a result of the research, I consider as main objective the management awareness on the importance of:

- the separation of accounting information from the fiscality in the economic and financial analysis;
- the scoreboard in the financial management of the entity;
- the working capital in the analysis of the entity´s financial balance;
- the picture of the intermediate management balances in the sectoral analysis of the entity;
- the tresury flows in the analysis of the entities´ capacities of releasing liquidity;
- the periodic analysis of the profitability, liquidity and solvency rates;
- the establishment of proper accounting policies according to entity´s interest entity, putting on the second place the fiscal aspect.

We admit the existence of certain limitations in the conducted research that might suggest the fact that the results are only provisional. The fieldwork also involves the inherent common interpretations relating to this method and of course the availability of the participants and of the data also represents a limitation.

We must acknowledge a few limitations of the investigation. The number of respondents, reported to the initial sample raises questions concerning the risk of not responding. This difference occurs when the group of respondents differs significantly from the sample population. Certain techniques, such as the fact of coming into direct contact with the respondents requesting for them several times can often lead to a risk decrease. Nevertheless, the lack of resources and distance kept us from implementing these measures. In the study, the risk of non-response could have been important if certain categories within the organizations would have systematically refused to answer to our survey. For example, certain companies that wished to protect the confidentiality of the solutions they found for risk management did not take part in the study, thus affecting the whole results´ assembly.

Any company exists and functions in the external environment, made of "opportunities and perils", which means that the results of its activity will depend both on the degree of knowledge of the physiognomy and "operating mechanisms of the environment" and on the company's ability and potential to take advantage of "opportunities" and to counter "perils" in the environment. The external environment comprises a complex set of heterogeneous factors: economic, social, cultural, legal, political, demographic, ecological, etc., which directly or indirectly influence the company's activity. Cost management is a separate element of cost calculation. Mere calculation gives us a picture of the cost components of a service or product. Cost management is based on calculation starting from this picture and aims to decrease the components of unit costs or of total costs.

After conducting an analysis of the present studies, the following can be observed:

- the managers would like to receive non-standardized accounting reports, as simple as possible, adapted to the activities, that use a simple and comprehensible terminology for the manager training activity;
- would like responsible, well-trained people that know their duties, tasks and responsibilities;
- the financial accounting information to be presented in the form of a brief report, kept up to date, that would lead to the increasing of entity´s performance.

In a market economy, the accounting information represents a force that gives decision-making power to those who hold it, even if this does not represent the absolute truth. As Michel Capron presented in his paper "*Accounting in perspective*", quoting André Cibert, "*there are as many truths as the number of recipients of the information and to the extent that it excludes quality, the reduction effect of each measure is inevitable.*" And authors such as Bernard Colasse or Daniel Boussard admitted the fact that " *the truth presented by accounting is only a filter that allows the understanding of a reality"*

In conclusion, we mention that any published report should present and analyze information regarding significant trends known to senior management, as well as commitments, events or uncertainties that can be reliably estimated, which would significantly influence the development of company business, its financial condition or activity results. Thus, although their names and content differ in time, and especially in space, financial and accounting reports are globally considered projections of enterprise activity, their true business card. The need for their preparation was induced by economic development and the goal is unitary: to provide a basis for decision-making, necessary for organizing and carrying out the activities of economic entities.

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