

RESEARCH ON THE USE OF MANAGEMENT ACCOUNTING SYSTEM IN EARLY DETECTION

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Abstract

Businesses are facing an uncertain world that is constantly changing due to social environment, consumer demand and product competitiveness, representing the determining factor of competitive market pressures. In order to choose between alternative business opportunities, the managers need information about future costs and revenues and how they may vary at different levels of activity. In decision-making processes, the information from the internal and external environment must be considered, in order to identify all the opportunities and threats specific to the activity. For an efficient and fruitful use of this information in business environment, management accounting systems are used for providing performance reporting, planning, budgeting and forecasting processes, which are fundamental to management. The aim of this study is to analyze the role of management accounting systems in decisions process, by improving understanding of how managers use management accounting systems, through a questionnaire addressed to automotive industry companies, at international level.

Keywords

Management accounting, decision process, systems, managers, automotive industry.

JEL Classification

M10, P40, D81

Introduction

Information from internal and external environment must be taken into account in decision-making processes in order to identify all the opportunities and threats specific to the activity. For efficient and fruitful use of this information in the business environment, managerial accounting systems are used to provide the performance reporting, planning, budgeting and forecasting processes that are fundamental to management.

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According to Drury (2009) “in addition to allocating costs and providing (financial) information on planning, monitoring, measuring performance and continuous improvement, one of the key functions of management accounting systems is to provide relevant information to help managers make more informed decisions”.

The importance of this topic derives from the close connection between the role of decision-making and early detection of risks and opportunities specific to the company, which are necessary to be considered in the development of management accounting systems, as it helps to achieve competitive advantage.

This study aims to explore the role of management accounting systems in the early detection of risks or opportunities, materializing with the help of a software tool for building and visualizing bibliometric networks and by analyzing and interpreting the results of the applied questionnaire.

Management accounting includes the design and use of accounting within the organization, not based on a set of fixed rules, but rather on management accounting methods to achieve organizational goals by assisting managers in the decision-making process. Management accounting uses both real information and estimated data to assist managers in day-to-day operations and forecasting for future operations, addressing specific issues they face at different levels of business.

Being a system for collecting, measuring and exploiting financial data, with a guiding role in management activity, management accounting develops and supports the values necessary to achieve the strategic objectives of the company.

1. Review of the scientific literature

Author White (2009) considers management accounting to be “designed to provide managers with the information they need to make decisions that will optimize the business to meet the strategic, economic and profit objectives set by the organization's management. If the strategies are right for the market, they increase the value of the business for the owners”.

According to the authors Briciu, Căpușeanu (2011, pp. 57-68), “management accounting must provide the manager with those strictly necessary elements to make him understand the phenomena and processes that take place in the entity, to provide him with operative information on the basis of which he can take relevant decisions, to be able to foresee the repercussions of the decisions taken and at the same time to have the leverage to carry out a permanent and effective control”.

Studying the literature, we notice that the information from management accounting systems provides an essential perspective on the company's resources. Hence, based on real information it is possible to detect threats and opportunities early and make efficient decisions. In order for management accounting systems and the information that comes from it, to be relevant and useful, they must meet certain qualitative characteristics.

Qualitative characteristics of the information:

- Purpose - represents the degree of completeness that the information processed and analyzed by the managerial accounting systems reaches
- Timeliness - the size of the timeliness of the information that comes from the managerial accounting system represents the degree of their updating
- Format - is the way in which information can be understood and interpreted by the user
- Accuracy - represents the correctness of the information and its lack of ambiguity

Qualitative characteristics of the systems:

- Accessibility - measures how easily users can access management accounting information
- Interactivity - refers to the interaction between the user and the management accounting systems
- Integration - consists of two different aspects: integration of information from different areas of the company and integration between objectives, strategies and operations
- Flexibility - represents the degree of adaptability of the systems taking into account the user's need

According to the managerial accounting literature, “existing management control practices and cost accounting procedures are unlikely to meet the management needs of modern business production operations and not provide useful indicators for decision making”.

For an in-depth analysis of the international literature, we used Web of Science (WoS) platform to determine the stage of scientific research on management accounting systems and their information. The research protocol on the Web of Science (WoS) platform was as follows:

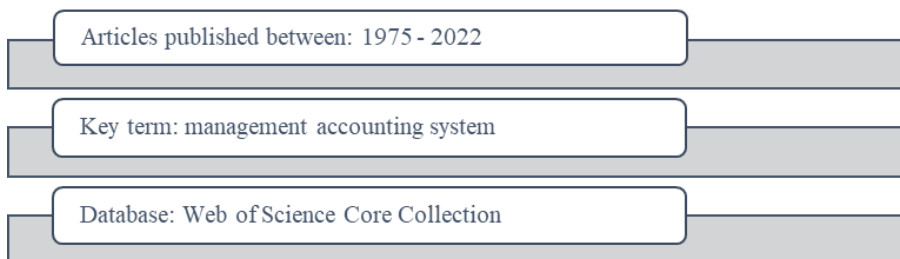


Figure no. 1. Search protocol – Web of Science

Source: Own processing based on Web of Science Group (clarivate.com)

Based on the search protocol mentioned above, 2,629 articles were published between 1975-2022, with open access, in the fields of Management, Business Finance, Economics, Business; with the highest number of publications in 2020 (449 articles).

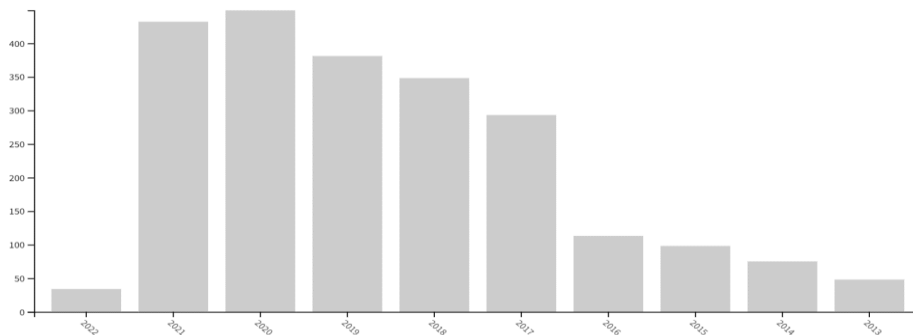


Figure no. 2. Chronological view of published papers and citations

Source: Own processing based on Web of Science Group (clarivate.com)

Publications related to management accounting systems are available in 116 countries, the chart below showing the top 10:

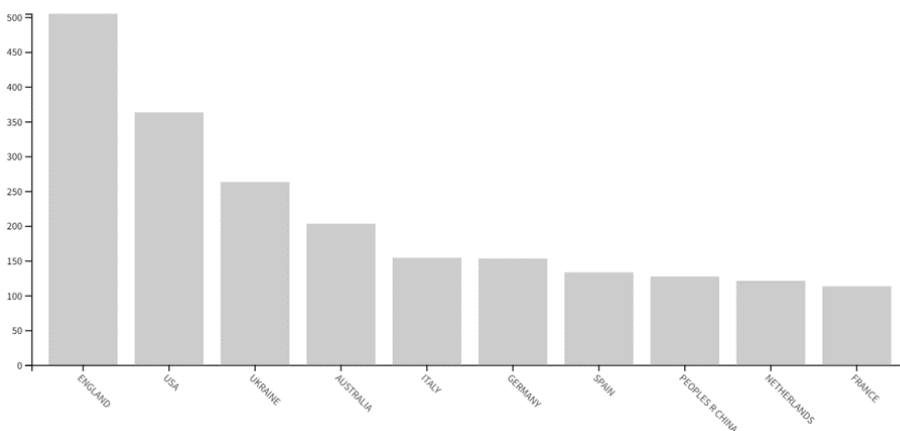


Figure no. 3. Published papers by countries

Source: Own processing based on Web of Science Group (clarivate.com)

The top is led by England with 505 published works, followed by the USA with 363 publications. Romania ranks 28th with 37 publications, noting that European countries and China are in the minority.

In order to visualize the interconnectivity between terms based on VOSviewer software tool we performed a bibliometric analysis related to management accounting systems and their information, using the keywords from the titles / abstracts of articles published on the WoS platform.

Based on the search used on the WoS platform, there were 2,629 articles with Open access published from 1975 to 2022. As a result, VOSviewer software extracted 53,239 terms, of which only 133 terms reached the threshold of at least 100 of frequencies. The complete bibliometric network of key terms is presented in the following figure, where three different categories are highlighted according to their relevance:

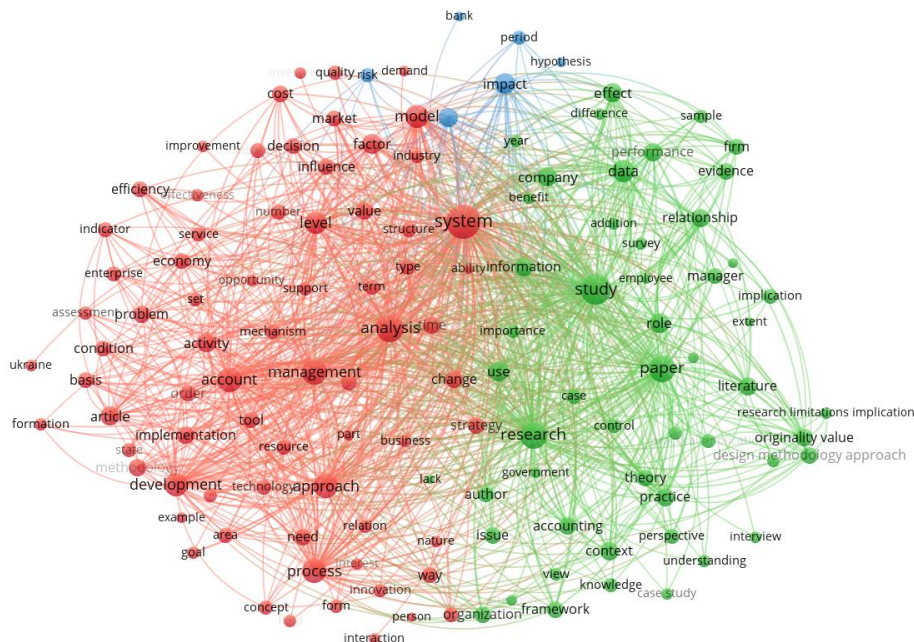


Figure no. 4. Complete network of key terms

Source: Own processing based on Wosviewer tool

The first cluster is the largest, consisting of 73 key terms (red) centered around the concepts: management, system, development, efficiency, decision, industry, process, analysis, implementation, basis.

Authors Sutcliffe et al (2001) consider that “in order to deal with strategic issues, organizations analyze, interpret and control the flow of information so as not to be blinded by threats or unprepared for opportunities. Management decisions are based on information from the management accounting systems implemented in order to effectively manage and control the company’s resources in order to meet the objectives”.

The second cluster contains 52 key terms (green) closely related to study, research, accounting, information, data, company, role, importance, effect.

According to Garg et al (2003), “this link expresses the importance that the role of managers is to relate the company’s strengths and weaknesses to specific opportunities and threats, thus requiring information from the internal and external environment”.

The third cluster contains 6 key terms highlighted in blue, related to impact, risk, country, assumptions, period. This group states that the impact on the company can be estimated through the necessary periodic planning, budgeting and forecasting processes and through assumptions can be identified and quantified possible opportunities or risks.

The author Cokins (2013) argues that “the initial state of an organization - the types of products and services it produces and provides, as well as its spending structure - governs its initial management accounting methodology”.

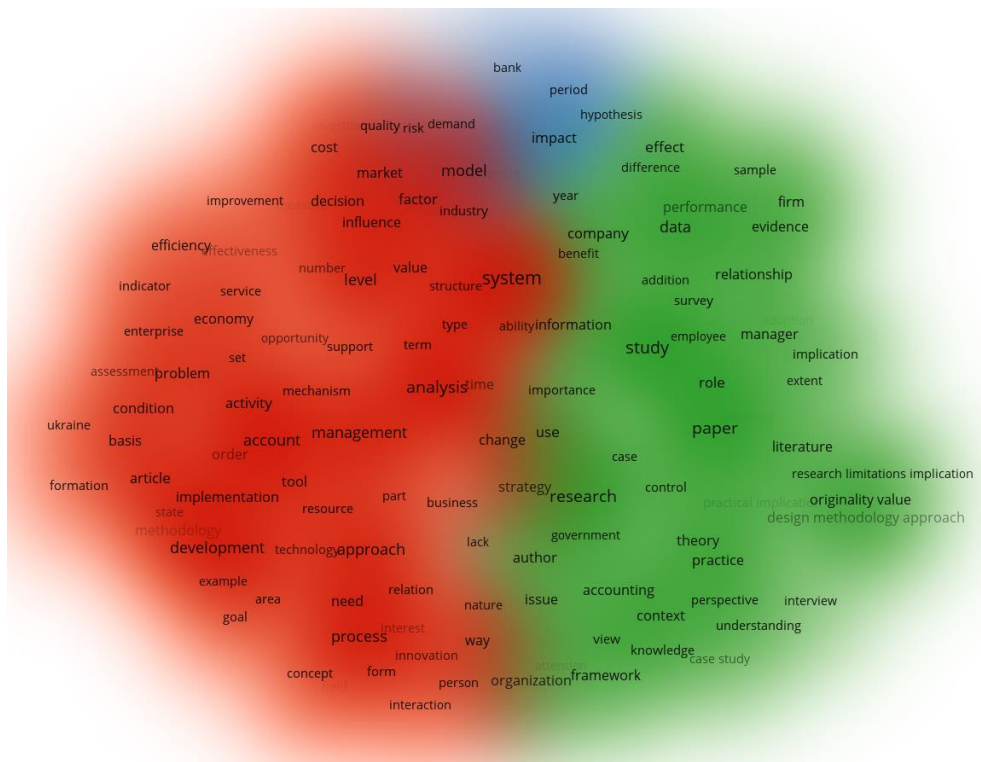


Figure no. 5. The intensity of the groups

Source: Processing based on Wosviewer tool

The intensity of the groups is also highlighted in the previous figure, observing that the group with the lowest intensity is the blue one, and the most intense group of terms being the red one.

Bhimani (1993, pp. 20-22) considers that “performance appraisal in traditional management accounting was based entirely on financial data, ignoring some major features of automation performance requirements, such as customer satisfaction, flexibility, and innovation”.

Ingo et. al (2021) consider that “cost forecasting allows companies to speed up decision-making, cost management, and budgeting for a particular project. Good estimations have a direct and significant impact on the effectiveness of companies. This is why time and resources have been invested in studying and developing new techniques and methodologies aimed at optimizing this type of process”.

Analyzing the following figure, we can observe that the terms: management, system, research, development, analysis and accounting, have a much higher intensity than the other terms, being closely related to each other.

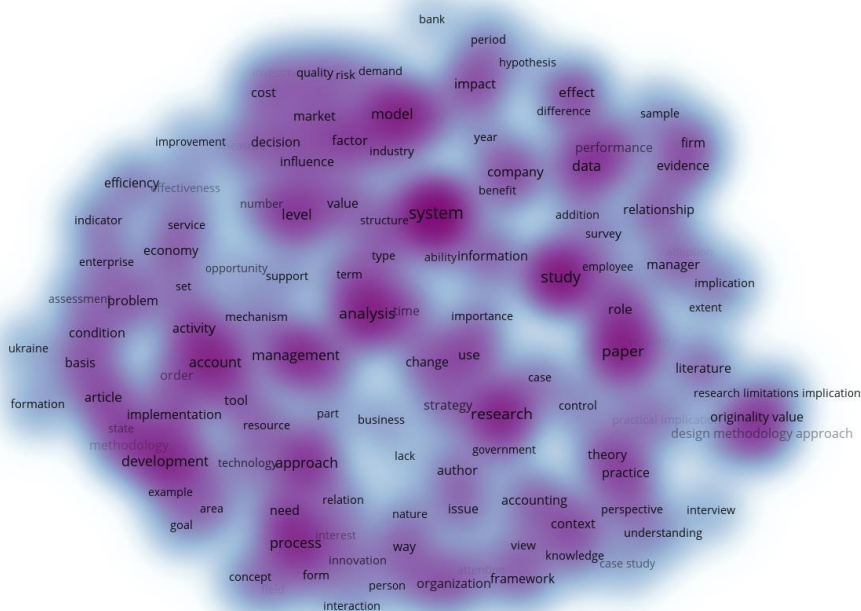


Figure no. 6. The intensity of terms

Source: Processing based on Wosviewer tool

Through the bibliometric analysis performed on VOSviewer software we notice that the most intense relationship starts from the key term “system”, and in the context of our research this relationship represents a significant impact, because it is in line with the research topic.

Following his research, Miller (1998, pp. 132-139) relates that “the practice of managerial accounting is the result of the interaction of a variety of parts and contexts”.

According to Hoozee et. al (2018, pp. 374-390), “management accounting systems have a potentially important role in organizations. The generated information provides a basis for initiating, facilitating and supporting management decisions and for providing feedback on the decisions that are being made. Therefore, the role of managerial accounting systems can have a significant impact on organizational performance”.

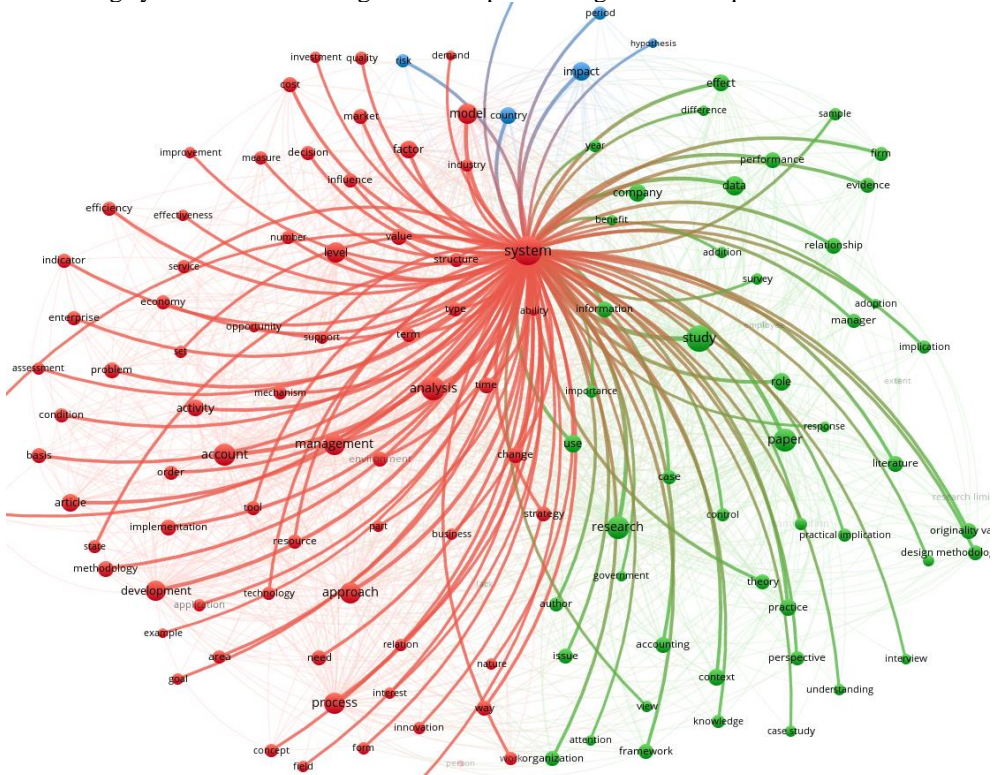


Figure no. 7. The strongest connection: “system”and other terms

Source: Processing based on Wosviewer tool

Establishing and implementing risk prevention measures, detecting and correcting deviations that occur in the company and may affect the achievement of company objectives, and verifying the existence of appropriate processes and planning mechanisms for the design and organizational development of the company are also important objectives.

Based on a synthesis of the results of the bibliometric analysis from the literature, we can conclude that the management accounting systems and the data provided by them

are fundamental to ensuring the quality of information and protection of company resources through early detection.

2. Research methodology

This research aims to improve understanding of how managers use management accounting systems. Therefore, the main objective of the research helps to explore their role in early detection: the importance of quality information and the dimensions of system quality through the prism of users of management accounting systems in early detection.

The presentation of this exploratory study on the role of management accounting systems aims at the three main phases of the research process: theoretical substantiation, research design and elaboration of proposals from research results, and finally discussion of findings.

The managers and employees who carry out the activity in the financial field in the automotive industry represent the subjects of the analysis of this study. In fulfilling the role of data analysis and processing, many participants are involved, being on different levels of the hierarchical scale.

According to the author Einsenhardt (1989, pp. 532-550), managers are particularly interested in making strategic decisions because they are “usually the first to notice potential threats and opportunities in their own field”.

The companies selected to participate in this study have complex development cycles for products with a long lifespan, and therefore they need to identify and understand in advance the weaknesses that precede strategical issues.

The questionnaire consists of 34 questions related to management accounting systems, being structured in eight clusters, as follows:



Figure no. 8. Questionnaire clusters

Source: Own processing

The research methods used for the elaboration of this paper are: review of the specialized literature, method of structuring the research, documentation, data collection, information processing, chronological study, construction, observation, visualization and analysis of bibliometric networks, analysis and interpretation of

results, questionnaire interview. We performed these methods by consulting specialized works, various articles and publications, using international databases and software tools, interviewing the target group, as well as direct documentation that requires knowledge of the practical reality of a multinational company.

3. Results and discussion

In order to understand how management accounting systems and the information derived from them, contribute to the early detection of threats or opportunities, the author addressed a questionnaire consisting of relevant questions and based on the answers received, relevant conclusions will be drawn.

To this questionnaire, we had 46 respondents working in the financial department in automotive industry, of which 61% are not in a management position, and 39% occupying a management position.

The Likert scale was used for the analysis of the answers, the respondents of the interview evaluating the usefulness of the managerial accounting systems in observing the strategic issues on a scale from -2 (not useful / total disagreement / very low) to +2 (very useful / total agreement / very high):

$$\begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ -2,0 & -1,0 & 0,0 & 1,0 & 2,0 \end{bmatrix}$$

Figure no. 9. Likert's scale

Source: own processing based on questionnaire answers

Forwards, we investigated the impact of managerial accounting systems on early detection of strategic issues. As mentioned above, the questionnaire was divided into eight clusters. The first four clusters refer to the qualitative characteristics of the information, while the last four clusters analyze the qualitative characteristics of the management accounting systems used in practice.

The first cluster (purpose) regarding the degree of completeness of the information processed and analyzed by the management accounting systems, included questions related to the diversity of information provided by these systems. Based on the number of answers from respondents, we can observe that 29% of them considered that the completeness of the information provided by the management accounting systems used is low, while only 9% considered that it is very high.

Looking at the following figure, the question that obtained the highest score refers to the information on performance, demand for products and provision of services, being more accessible information. We can state that the respondents, through the systems they use, do not have equal access to information related to external factors of the organization, resulting in the lowest score on the first two questions.

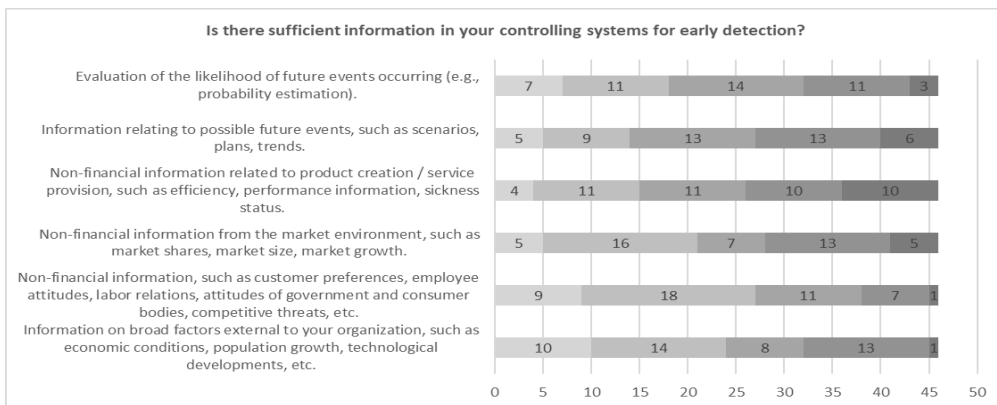


Figure no. 10. Scope cluster - questions

Source: own processing

Evaluating the results of the first cluster, we can confirm that the degree of completeness of the information processed and analyzed by management accounting systems is a downward trend (average being -0.1) according to the average of the scores obtained by Likert analysis.

Medie	-0,1	1												
Raspunsur Likert	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	10	-20	9	-18	5	-10	4	-8	5	-10	7	-14		
2	14	-14	18	-18	16	-16	11	-11	9	-9	11	-11		
3	8	0	11	0	7	0	11	0	13	0	14	0		
4	13	13	7	7	13	13	10	10	13	13	11	11		
5	1	2	1	2	5	10	10	20	6	12	3	6		
		-0,41304		-0,58696		-0,06522		0,23913		0,130435			-0,17391	

Figure no. 11. Likert result – scope cluster

Source: own processing

This analysis shows that the information accessed by users is not sufficient to facilitate the early detection of risks and opportunities as there is a discrepancy between operational information and strategic planning data, and information is needed to build scenarios, analysis tools, integrated views and management reports.

The second cluster (timeliness) refers to the degree of updating of information and its frequency. Based on the number of respondents, we can see that 27% of them considered that the degree of updating of information provided by the management accounting systems used is an average that tends to be very high (26%), while only 7% of respondents considered it very low.

Analyzing the following figure, it can be observed that the questions obtaining the highest score refer to the way of presentation and the frequency of their provision. From this analysis, the identified problem refers to the fact that the information is not provided in real time, thus resulting in the lowest score on the third question.

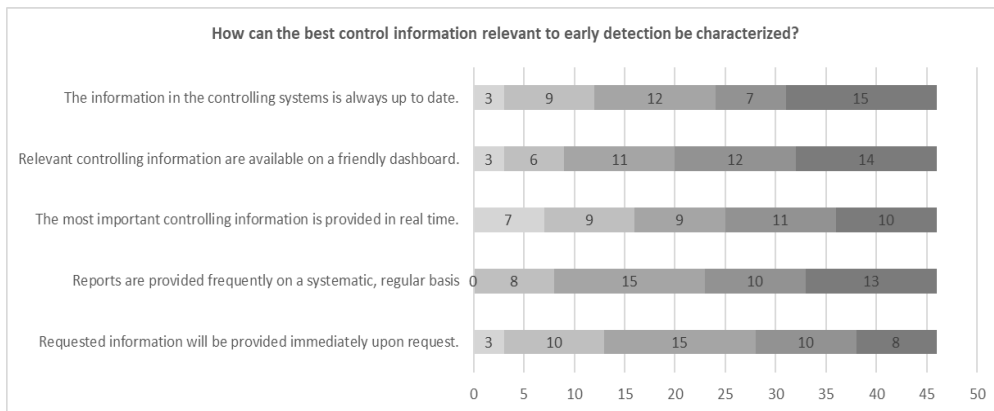


Figure no. 12. Timeliness cluster - questions

Source: own processing

According to the average of the scores obtained by the Likert analysis, analyzing the results of the second cluster, we notice that the degree of timeliness reached by the information processed and analyzed by management accounting systems is average that tends towards high (average being 0.4).

Medie	0,4	2									
Raspunsur	Likert	1.	Requested informat	2.	Reports are provide	3.	The most important c	4.	Relevant controlling	5.	The information in ti
1	-2,0	3	-6	0	0	7	-14	3	-6	3	-6
2	-1,0	10	-10	8	-8	9	-9	6	-6	9	-9
3	0,0	15	0	15	0	9	0	11	0	12	0
4	1,0	10	10	10	10	11	11	12	12	7	7
5	2,0	8	16	13	26	10	20	14	28	15	30
		0,217391		0,608696		0,173913		0,608696		0,478261	

Figure no. 13. Likert result – timeliness cluster

Source: own processing

Clusters three (format) and four (accuracy) represent the way in which information can be understood and interpreted by the user and the correctness of the information provided.

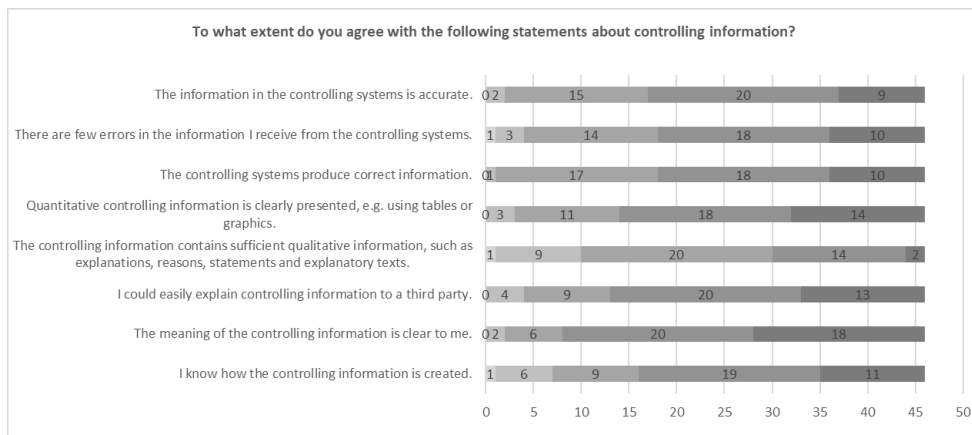


Figure no. 14. Format & accuracy cluster - questions

Source: own processing

Analyzing the number of respondents' answers regarding the information format, we can state that 43% of them considered that the degree of understanding and interpretation of the information provided by the management accounting systems used is a large one that tends to very high (30%), while only 1% of respondents considered it to be very low.

Going back to the accuracy of the information, we can observe that 38% of respondents considered that the degree of accuracy of the information provided by the management accounting systems used is high, and 33% considered it to be average.

By analyzing the results using the Likert scale, we conclude that the format and accuracy of the information from the management accounting systems have an average degree that tends to increase (the average being 0.4), meaning that users can easily understand and interpret the information from the systems.

Medie	0,7																				
Medie	0,7																				
Raspunsur Likert		1.1 know how the cont	2.The meaning of the	3.I could easily explain	4.The controlling infor	5.Quantitative controll	6.The controlling syst	7.There are few error	8.The information in tl												
1	-2,0	1	-2	0	0	1	-2	0	0	0	0	1	-2	0	0						
2	-1,0	6	-6	2	-2	4	-4	9	-9	3	-3	1	-1	3	-3	2	-2				
3	0,0	9	0	6	0	9	0	20	0	11	0	17	0	14	0	15	0				
4	1,0	19	19	20	20	20	20	14	14	18	18	18	18	18	18	20	20				
5	2,0	11	22	18	36	13	26	2	4	14	28	10	20	10	20	9	18				
		0,717391	1,173913	0,913043	0,152174	0,934783	0,804348	0,717391	0,782609												

Figure no. 15. Likert result – format & accuracy cluster

Source: own processing

The following figure is divided into two clusters - 5 (accessibility) and 6 (interactivity) - which evaluate the degree to which users can access information and the degree of interaction with systems.

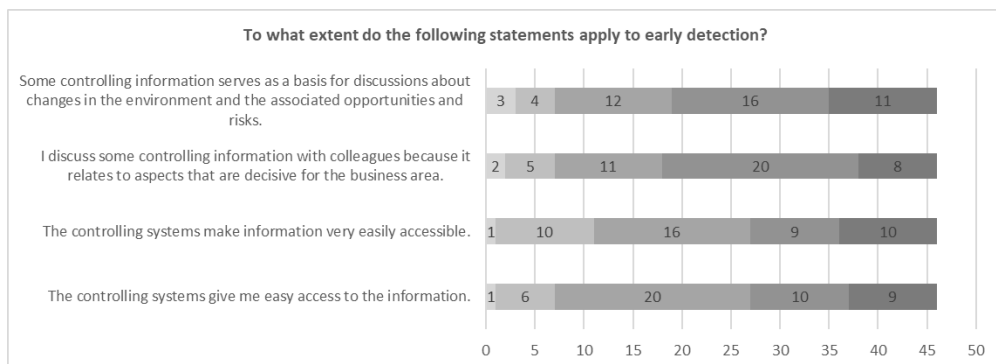


Figure no. 16. Accessibility & interactivity cluster - questions

Source: own processing

Medie	0,3								
Medie	0,4								
Raspunsur Likert		3							
1	-2,0	1	-2	1	-2	2	-4	3	-6
2	-1,0	6	-6	10	-10	5	-5	4	-4
3	0,0	20	0	16	0	11	0	12	0
4	1,0	10	10	9	9	20	20	16	16
5	2,0	9	18	10	20	8	16	11	22
		0,434783		0,369565		0,586957		0,608696	

Figure no. 17. Likert result – accessibility & interactivity cluster

Source: own processing

Analyzing the number of responses, we note that on average 39% of them considered that the degree of accessibility of management accounting systems used is average and the degree of interactivity is higher, thus representing an extraordinary support in early detection of risks / opportunities.

According to the analysis based on the Likert scale, we can conclude that the strategic discussions are based on certain information from the management accounting systems being decisive for the organization. Therefore, the demand for transparency in any form should be the “safe pillar engine” and not the fear of losing the advantage of knowledge and thus the alleged “loss of power”.

The seventh cluster (integration) regarding the degree of integration, includes questions related to the integration of information from different areas of the company. Based on the number of respondents, we can see that 45% of them considered that the degree of integration of the information provided by the management accounting systems used is average, while only 7% considered that it is very high.

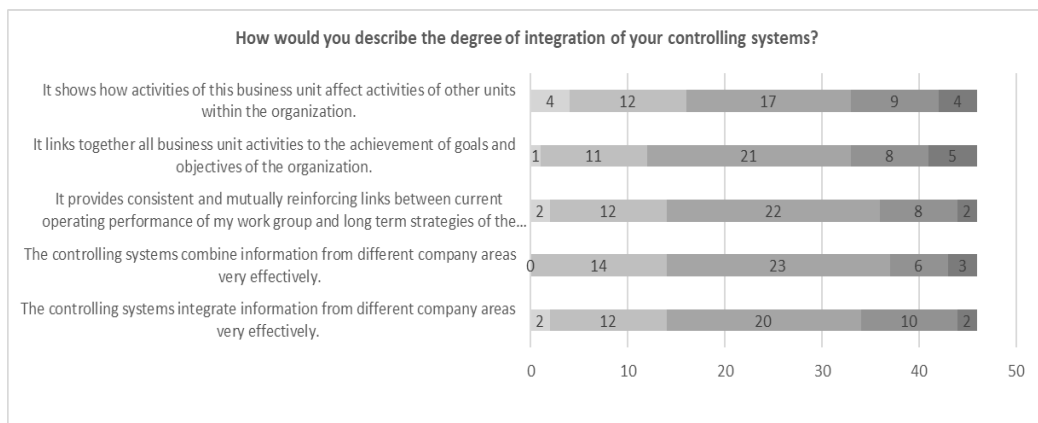


Figure no. 18. Integration cluster - questions

Source: own processing

Analyzing next figure, a very low score is observed due to the lack of clear connection between the group's performance and the company's strategies.

Medie	0,0	5										
Raspunsuri	Likert	1. The controlling syst	2. The controlling syst	3. It provides consisten	4. It links together all b	5. It shows how activiti						
1	-2,0	2	-4	0	0	2	-4	1	-2	4	-8	
2	-1,0	12	-12	14	-14	12	-12	11	-11	12	-12	
3	0,0	20	0	23	0	22	0	21	0	17	0	
4	1,0	10	10	6	6	8	8	8	8	9	9	
5	2,0	2	4	3	6	2	4	5	10	4	8	
			-0,04348		-0,04348		-0,08696		0,108696			-0,06522

Figure no. 19. Likert result – integration cluster

Source: own processing

Based on the results obtained by analyzing the Likert scale, we can conclude that the level of integration of the systems used is an average one with a decreasing trend (-0.02), thus representing an identified problem, relevant for the future development of managerial accounting systems.

They should be developed not only from a financial perspective, but also from a general perspective of the company's management and therefore be integrated with the systems of all departments.

The last cluster (flexibility) aims at the degree of adaptability of the systems taking into account the needs of the users.

Based on the answers received from respondents, we can observe that 40% of them considered that the degree of flexibility of the management accounting systems used is medium, while only 8% considered that it is very high.

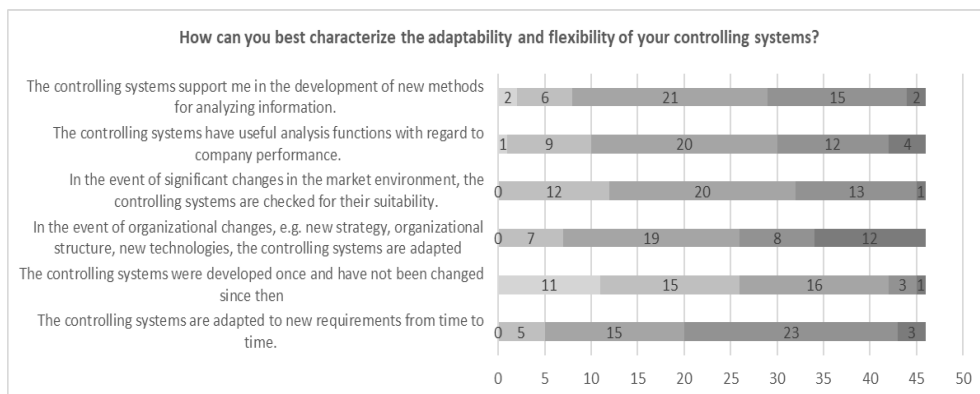


Figure no. 20. Flexibility cluster - questions

Source: own processing

The problem identified through this cluster is that the systems no longer benefited from subsequent development upgrades and they are not checked frequently for their suitability.

Medie	0,1	6											
Respunsur	Likert	1. The controlling syst	2. The controlling syst	3. In the event of organ	4. In the event of signi	5. The controlling syst	6. The controlling syst						
1	-2,0	0	0	11	-22	0	0	0	0	1	-2	2	-4
2	-1,0	5	-5	15	-15	7	-7	12	-12	9	-9	6	-6
3	0,0	15	0	16	0	19	0	20	0	20	0	21	0
4	1,0	23	23	3	3	8	8	13	13	12	12	15	15
5	2,0	3	6	1	2	12	24	1	2	4	8	2	4
			0,521739		-0,69565		0,543478		0,065217		0,195652		0,195652

Figure no. 21. Likert result – flexibility cluster

Source: own processing

Many management accounting systems are not upgraded and use Excel files as a basis, the level of complexity at the group level being too high because each company operates on different processes.

Conclusions

Starting from the main objective of our research: the use of systems in early detection, we can conclude that management accounting systems provide useful information to stakeholders for the early detection of opportunities or risks, providing support in decision-making. Therefore, the information provided by these systems can determine the future success of the company, meeting the quality requirements.

Based on the analysis of the results of the applied questionnaire, we can conclude that the relevance of the systems and of the information procured by them depends on their qualitative characteristics.

For example, the “scope” information characteristic, which represents the degree of completeness of the information processed and analyzed by the management accounting systems (which was previously analyzed) shows that the information needed by users to facilitate the early detection of risks and opportunities is not sufficient.

Another important feature for information, analyzed in this study is the accuracy, because it represents the correctness of the information and its lack of ambiguity, being fundamental to any information user.

In terms of system features: the accessibility, interactivity, level of integration and flexibility of systems represent key elements for the efficient use of the systems and procurement of information, necessary for the detection of chances or threats, being the basis for future decisions.

As the author Myrelid (2013, p.2) relates, “an excellent management accounting system will not in itself guarantee success in today's market, but an inefficient management accounting system will undermine superior product development, process improvement and marketing efforts”.

In strategic decision-making, early detection of opportunities or risks in planning and budgeting, the stakeholders and directly involved parties pay major attention to management accounting systems and information provided, their actions being based on these.

Thus, if the systems have a high degree of adaptability to the needs of users, integrate information from several areas of the company and are easily accessible to users, they can be used for in-depth analysis and scenarios regarding future perspectives of the company.

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