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THE FIRM'S PERFORMANCE MEASUREMENT SYSTEM. DESCRIPTIVE AND BIBLIOMETRIC ANALYSIS

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Abstract
In practice, a variety of models are used to measure and analyse the performance of a business. Analysis of company performance is fundamental, as competition between economic agents for each market segment has become increasingly fierce, and the weakest often cannot hold their own. In order to survive in this competition it is necessary for companies to identify and reduce vulnerabilities as far as possible by implementing effective management tools that are useful in detecting and addressing weaknesses in company management. A good performance measurement system is one that uses appropriate performance measures, which are performance metrics used to assess a specific attribute of a manager's role, to evaluate management in a way that will link the goals of the corporation with those of the manager. Organizations need to establish performance indicators, implement performance measurement systems that support development strategies to ensure effective resource management, streamline processes and drive continuous improvement. This paper aims to capture the theoretical aspects of the concepts found in a performance measurement system, as well as to carry out a bibliometric analysis of the topic "company performance measurement system" through which numerous authors have been identified who have contributed to the creation and development of the concept analyzed.

Keywords: *Business Performance Management, financial and non-financial indicators, key performance indicators, Balance Scorecard, performance management, performance measurement system, strategic management.*

JEL Classification: *M10, M21, M41.*

I. INTRODUCTION

Given the continuous changes in recent times, both nationally and internationally, we can say that the business world has witnessed a real explosion in terms of the concept of performance, concomitant with performance management and management practices applied to organizations (Mihalciuc, 2022). Collecting and analysing data in a constant way provides management with real-time information to evaluate, control and improve systems, as well as information on meeting customer requirements and achieving objectives. Analysing financial indicators is not enough to make decisions, managers must also take into account non-financial factors, invest in human resources, internal processes, pursue customer loyalty, invest in improving products and services and make decisions efficiently and effectively. Today, particular attention is being paid to the development of strategic management mechanisms within companies and to improving business processes. Thus, the aim of the paper is to review the literature with reference to the system of measuring the performance of a firm.To achieve this goal, we set the following objectives: Objective 1: *To deepen the literature on the topic "company performance measurement system"*; Objective 2: *Bibliometric and contextual analysis of the literature indexed on the Web of Science (WOS) platform on the topic "company performance measurement system";* Objective 3: *Identification of key concepts on the topic based on the scientific production related to the proposed topic and study of the resulting research clusters*. The bibliometric analysis carried out within the framework of the work, generated a series of information on the volume of publications indexed on the Web of Science platform with the topic "company performance measurement system", through which we identified numerous authors who have contributed to the development and implementation of an efficient system of company performance measurement. The contextual analysis aimed to identify concepts and keywords associated with the same theme, within the publications indexed in Web of Science, as well as to identify the relationships between them. This helped to create an overview of the theme and helped to identify new research directions.

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II. LITERATURE REVIEW

Performance measurement has its roots in early accounting systems, and an excellent example is how a pre-industrial organization could maintain good records of external transactions and inventories without resorting to higher-level techniques such as cost accounting (Johnson, 1981). In various studies (Johnson, 1972) a detailed description is given of how management accounting developed in the US between the 1850s and 1920s as industrial organizations moved from piecework to payroll; single to multiple operations; from individual manufacturing plants to vertically integrated enterprises. Over time, companies began to use budgeting and management accounting techniques, presented in various management reports (Welsch, 1958). Traditional accounting-based performance measures have been characterized as solely financially based, outdated, and more concerned with departmental performance than overall health or business performance (Olve et al., 1999). Thus, by the 1980s, traditional accounting measures were criticized as inadequate for managing day-to-day business, for encouraging long-term decision making, and for their applicability to modern manufacturing techniques (Hayes & Abernathy, 2007). We thus observe that in the late 1980s and early 1990s there was a great deal of interest in developing more balanced performance measurement systems, with the creation of frameworks such as the performance support matrix (Keegan et al., 1989), the SMART pyramid, the Results/Determinants Matrix and the Balanced Scorecard, frameworks that overcame many of the traditional financial shortcomings are still being developed today.

A good performance measurement system should have the following characteristics (Bourne et al., 2003): it should be based on activities over which managers have control or influence; it should be measurable; it should be timely; it should be consistent in its application, and where appropriate, actual results should be compared with budgeted results, standards or past performance. A performance measurement system constitutes a cycle that includes the following major phases of activity (Wolk et al., 2009):

- ***Mission and vision of success:***mission and vision of success work together to guide an organisation's activities and operations;
- ***Activities and operations***: activities are any programs, services, and initiatives led by an organization, and, operations are the organizational infrastructure that supports these activities, including human resources, technology, and financial management, both activities and operations are necessary to achieve the mission and vision of success;
- ***Measurement***: measuring the operational performance of organisations involves the use of metrics, tracked on a regular basis, to evaluate their activities and operations;
- ***Reporting:*** organisations can use as reporting tools, a dashboard, which includes a set of selected indicators, to regularly provide information of the organisation's progress on past performance and future goals, as well as an external report card, which helps to establish accountability with social impact investors;
- ***Improvement***: the organisation implements its decisions to improve its activities and operations.

A good performance measurement system is one that uses appropriate performance measures to appropriately assess corporate goals against those of the manager. In the business environment, individuals designing the performance measurement system must have extensive knowledge of the corporate strategic plan and overall goals set by the organization, as well as a clear understanding of job descriptions, each manager's responsibilities, and reward and compensation trends (Principles of Accounting Volume 2 Managerial Accounting, 2019). Many other companies in various industries also use performance measurement as a critical part of their management and strategic planning processes to monitor their performance, make data-driven decisions, and achieve their business goals. The increased pace of business has led to the emergence of the need to have quick access to key information of the organization, and for performing work tasks on time and making correct decisions by managers, a high-performance information system must be used to meet the core business requirements of the organization (Jituri et al., 2018).

III. RESEARCH METHODOLOGY

The research mechanism that was the basis for the proposed bibliometric analysis is based exclusively on the objective way in which the papers were chosen from the Web of Science (WOS) database, and the data were then processed using the VOSviewer program in order to interpret the links between the keywords used in these searches. This program is a powerful tool for network analysis, being an application through which literature is visualized, organized and analyzed, which helps to visualize their dynamics and structure in research, being used to process the database's (Vallaster et al., 2019).The analysis includes a search of the literature referring to this concept, using Web of Science academic databases, in order to identify scientific articles and other sources related to the concept of company performance measurement system in order to perform an analysis on their content. Thus, the bibliometric analysis was carried out based on a number of 500 papers published on the Web of Science platform with the topic "company performance measurement system", for an analysis period of 13 years, i.e. 2010-

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2023. The technique subjected to bibliometric analysis in the present study is based on three important steps, namely:

1. Collection of the necessary data (following the application of the inclusion and exclusion criteria to the results initially retrieved from the WOS platform, we obtained a total of 500 papers on the subject of "company performance measurement system", which is the database used in the analysis);

*2. Analysis of the key terms used in the papers with the analysed topic (*bibliometric analysis carried out using the VOSviewer software leads to the interpretation of the links between the key terms used in the studies returned by the search);

*3. Interpretation of the results obtained (*based on the bibliometric analysis, the study of the resulting search clusters shows that, starting from the key terms, we obtain several networks of key terms related to the topic "company performance measurement system", shown in Figure 2., through which we have made the interpretation of the links between these keywords used in the researches).

In order to process the data with the VOSviewer software, six steps will be followed, as can be seen in Figure 1.

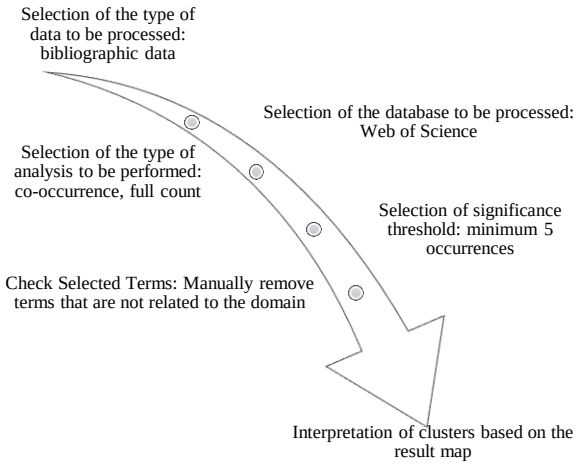

Figure 1. Steps to process the data collected from WOS using the VOSviewer program
Source: own processing

After going through the steps shown in Figure 1 a network of keywords used that converge around the item *"company performance measurement system"* will be obtained, according to the mapping in Figure 2.

IV. RESULTS AND DISCUSSIONS

The research is based on bibliometric analysis and the study of the resulting clusters. Starting from the key terms, we obtained several networks of key terms related to the topic "company performance measurement system", presented in figure 2, through which we made the interpretation of the links between these keywords used in the research.

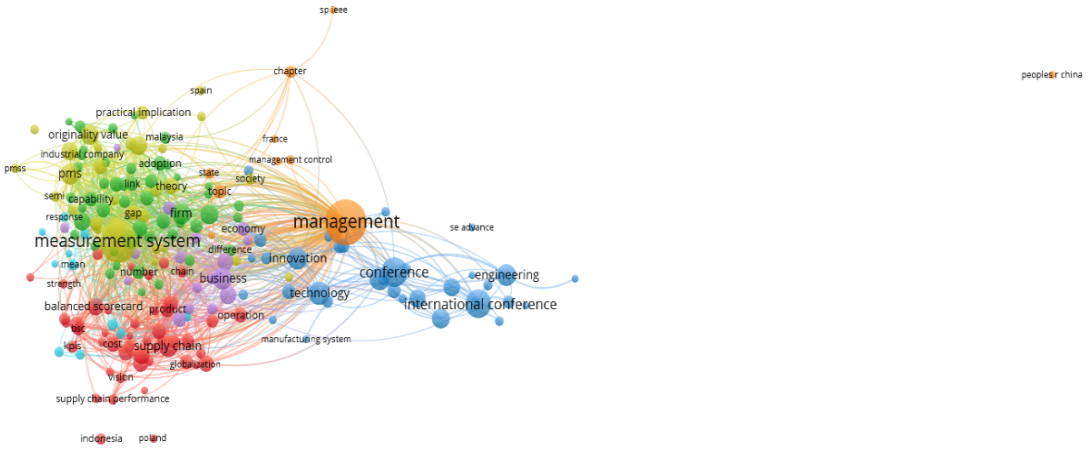

Figure 2. Steps to process the data collected from WOS using the VOSviewer program
Source: own processing in VOSviewer software

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We can see from Figure 2, the network of keywords related to the concept "company performance measurement system", in which 7 clusters are distinguished, grouped according to their relevance and frequency of occurrence, characteristics that are given by the size of the circles. The first two clusters appear to be the most complex in terms of component terms, with the same number of terms per cluster, i.e. 48, and are illustrated in red and green within the keyword network.

Thus, the red cluster focuses mainly on notions such as: „*advantage, balanced scorecard, bsc, chain, competitivenes, cost, decision making, effectiveness, efficiency, key performance indicator, KPI, Kpis, output, Poland, product, production, production system, productivity, scorecard, supplier, supply chain, supply chainmanagement, supply chain performance"*. These terms denote the close connection because, from the perspective of a management and performance measurement system, useful tools such as the Balanced Scorecard, Key Performance Indicators (KPI), supply-chain management, which are used to measure the performance recorded in the organization'sactivity (Mihalciuc & Grosu, 2019a) and through which projects, initiatives and daily activities are directly corrected in order to achieve the strategic objectives assumed by the organization (Parmenter, 2015). We thus observe that the BSC stands out as a modern performance measurement and management tool, which has become an indispensable instrument in the strategic management toolkit of modern firms (Stefănescu & Silivestru, 2012). To all these can be added the creation of value, integrating the perspective of the previous four (Aureli et al., 2018). Within the BSC, the attention of managers is directed to non-financial indicators with the role of assessing the degree of customer satisfaction, employees, process duration and quality of results (Stefănescu & Silivestru., 2012). The BSC is primarily a mechanism for implementing strategy and expressing the company's vision, whereby the most important success factors are defined and measures are designed to support the achievement of the firm's objective and performance measurement in vital areas from a strategic point of view (Bostan & Grosu, 2011). In general, the process of implementing a strategy is a top-down process, and a well-designed BSC should reflect the strategy as a basis for designing an effective and efficient management system (De Geuser et al., 2009). At the level of profit-seeking organizations, the financial perspective given by shareholders/funders comes first, followed by customers as direct users, internal processes expressed by activities, staff and innovation highlighted by adaptability and performance improvement, and to all these perspectives, the value creation perspective can be added (Aureli et al., 2018).

In the 80s, the term Service Management (SMS) was coined to express the need to integrate the business network, from the end user to the original end user. Original suppliers, by providing products, services and information, add value to customers and other interested parties.nd these sare furnize rroduse, servision and informație add value to customers and other interested parties (Alfalla-Luque & Medina-López, 2009). The term SCM provides a description of the entire pathway (operations and processing) of the raw material up to the finished product stage reaching the end user, the customer (Pienaar, 2009). Another view of the concept describes it as a structured process through which raw material reaches the finished product and is then sold to the customer (Beamon, 1998). Some literature (Lee & Billington, 1995; Heaver, 1999) has sought to give complex connotations to the concept of SCM, defining it as the combined and coordinated flows of goods from origin to final destination, as well as the information flows that are linked to it, i.e. the group of manufacturers, suppliers, distributors, retailers and providers of transport, information and other logistics management services that are engaged in the provision of goods to consumers. If we relate BSC to supply chains, an extension of the BSC model to an analytical BSC model (A-BSC) is observed in the literature (De Felice et al., 2015) for various analyses, such as: strategic performance analysis in an outsourced supply chain.Selecting the appropriate set of key performance indicators (KPIs) for measuring supply chain performance has always remained a challenge, which is why even in the literature (Anand & Grover, 2015) there are papers whose aim is to identify KPIs and classify them specifically for measuring supply chain performance. A predictive supply chain performance management model (Stefanovic, 2014) combines process modeling, performance measurement, data mining models and web portal technologies into a single semantic business intelligence (BI) supply chain model that integrates data sources and business rules and includes the data warehouse model with dimensions, measures and KPIs (key performance indicators) specific to the supply chain.

Cluster 2 in green has items such as:*capability, company performance, corporate performance, dimension, environmental performance, financial performance, firm, governance, performance measurment, profitability, risc, romania, sustainability, susitainable development.* The performance measurement system represents, on the one hand, that balanced and dynamic system, which is able to support the decision-making process by collecting, elaborating and analyzing information (Neely et al., 2002), and on the other hand, it represents that effective system for measuring the performance of an organization, made up of a set of indicators that are implemented in order to quantify the efficiency and/or effectiveness of an action (Neely et al., 1995). Sustainability, competitive advantage and performance management (PM) systems are still key topics in the hotel industry as well (Pereira-Moliner et al., 2021). Competing successfully in this era requires competencies not traditionally reflected in existing financial statements. To some extent, a heavy reliance on financial performance measures could hinder future competitive advantage because financial indicators are outcome measures, which do not reflect the drivers of future performance and true value creation (Chia et al., 2009). Over time, within the performance measurement systems,

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the BSC model evolved and developed towards a Sustainability Balanced Scorecard (SBSC) model (Falle et al., 2016) which was developed for SMEs. A 2021 study focuses on the sustainability balanced scorecard as a performance measurement and management control tool that can play a key role in guiding companies towards sustainability goals, while the Balanced Scorecard can also be used to support sustainability concepts (Hristov et al., 2019). In the upper levels of management, BSC indicators can be used to monitor, measure and respond to environmental and social issues by creating a vision of the future of the organization. BSC can help identify additional sources of income for the organization and adherence to responsible work standards ((Şimşit) Kalender & Vayvay, 2016).

The third cluster, represented by the color blue, finds in the network of keywords, a number of 34 terms that focus on notions such as: *„accounting, advance, business excelence, communication, education, economic, energy, engineering, information system, inovation, integration, intelectual capital, knoledge management, manufacturing system, organizational system"*. The use of indicators plays an essential role in planning and control activities, because they allow the establishment of quantifiable objectives that help not to anticipate future events and monitor current processes, helping in decision-making and in the pursuit of operational excellence (Mihalciuc & Grosu, 2019a). Consequently, the provision of these tools contributes to both innovation and knowledge management when they promote mechanisms that bring managers solid information about their processes (Samsonowa, 2014). Organizations are encouraged to use within the performance measurement systems, non-financial performance measurement methods, such as waste reduction and energy efficiency (Mihalciuc & Grosu, 2021; Grosu et al., 2023; Firtescu et al., 2023), to comply with new market requirements or the application of customer relations standards (Nesterak et al., 2023). In such situations, the balanced scorecard can be used effectively in the sustainable development process, by directly measuring and evaluating sustainable performance, also helping to monitor and manage the impact of the organization's activity on the environment (Figge et al., 2002). Providing appropriate performance measurement tools contributes to both innovation and knowledge management when it promotes mechanisms that bring managers solid information about their processes (Samsonowa, 2014). Key performance indicators are used within an organization's informational system to evaluate its performance in time and space, by comparing the entity's performance with other businesses in the same field of activity and can be considered as including a form of communication, through their adaptation to the specifics of the business (Dvulit et al., 2019).

Cluster number four, illustrated by the yellow color within the keyword network, totals a number of 30 terms, which mainly refer to concepts such as: *„corporate social responsabilities, measurement system, organisation, originality value,pms, pmss, quality management system, sme".* Performance measurement is used by organizations to ensure that they are moving in the right direction, reaching targets in terms of organizational goals and objective (Mihalciuc, 2021); to evaluate and control specific business activities; to measure and compare the performance of different organizations, departments, teams or individuals (Mihalciuc & Grosu, 2019b). The notion of performance has evolved towards a global performance that involves finding both financial and non-financial indicators, which reflect the economic organization as faithfully as possible and create value for it (Kristi & Yanto, 2020). In a performance measurement system, non-financial factors must not be missing (Mihalciuc & Grosu, 2022), found on the one hand through actions of the organization's responsibility towards society in general and towards the environment (Mihalciuc et al., 2022), which in recent years have substantiated and strengthened the concept of corporate social responsibility (Paula Monteiro et al., 2022). Performance measurement (PM) is key to controlling business results (Bendle et al., 2016). The implementation of contemporary performance measurement systems requires managers to change their attitudes when it comes to non-financial metrics (de Waal & Kourtit, 2013), regarding non-financial metrics as company development factors (Raguž & Jelenc, 2010) and as far as management decisions are concerned, they will be based on precise quantitative and qualitative information, and not on managers' experiences (Pugna et al., 2019). Researches based on information technology have shown that the existing performance measurement systems (PMS) are not suitable for measuring and managing IoT (Internet of Things) business logic, presenting three measurement pitfalls, a set of indicators key performance indicator (KPI) suitable for driving IoT business in product companies and three recommendations for implementing the set of KPIs (Lamprecht et al., 2022).The analysis of the results of a research on the measurement structure of performance indicators and the attitudes of hotel managers regarding the usefulness of performance indicators showed that, along with traditional financial indicators, non-financial indicators are also widely used. confirming that for winter destinations in the wider region of CEE countries, awareness of the importance of measuring non-financial metrics is growing (Jugović et al., 2022).

In the fifth purple cluster, a number of 17 items can be observed that revolve around the notions of „*ability, business, czech republic, competition, complexity, economy, overall performance, performance improvement, slovakia, performance management".* The results of performance indicators are used not only for process improvement, product manufacturing, application programming, employee activities, etc., but can provide organizations with reliable information to establish the basis for implementing their development strategies; provide a way to see if the strategic plan followed is working, serving as tools to induce the desired behavior; they can especially increase and improve operational efficiency, productivity and profitability (Selmeci et al., 2012).

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The results of performance indicators are used not only for process improvement, product manufacturing, application programming, employee activities, etc., but can provide organizations with reliable information to establish the basis for implementing their development strategies; provide a way to see if the strategic plan followed is working, serving as tools to induce the desired behavior; they can especially increase and improve operational efficiency, productivity and profitability (Hudson et al., 2001), the main reasons being the lack of human resources and managerial expertise (Garengo et al., 2005). n relation to the different characteristics of the companies, depending on their size, the performance measurement practices differ in relation to the size of the compan (Odar et al., 2012), noting that the performance measurement systems developed in theory do not seem to apply to small companies (Cocca & Alberti, 2010).

Cluster 6, light blue, sums up a number of 12 key terms, which focus on concepts such as:*„continous improvement, customer satisfaction, demand, health, safety",*from which we can understand that a performance measurement system , must be continuously improved, and be oriented towards a perspective on the satisfaction of the customers of an organization. Also, within this cluster, we find "health" and "safety" as the main term, which shows that in the health industry, too, the emphasis is on a proper performance measurement system. Related to the health sector, government hospitals have operated for several decades in a stable and protected environment without intense competition (Oliveira et al., 2020). However, in a wave of improvement in people's care experience and the level of public trust towards the government hospital, a more autonomous management system is required in the current trend (Bassani et al., 2022). Based on an analysis of three countries, namely Portugal, Spain and Italy, it was shown that an essential management tool for healthcare organizations is the BSC (Gonzalez-Sanchez et al., 2018). For example, the BSC helps quantify the intangible assets of healthcare services that make a huge difference in a competitive market (Santos Cebrián & Fidalgo-Cervino, 2004), the development of the BSC being recommended for monitoring performance in the medical field (Baraldi et al., 2010).

The seventh cluster, colored orange, captures 7 items:*„france, serbia, management, management control, management control system, state".* Rust et al. (2004) believe that the implementation of a PM system becomes effective when company managers begin to observe PM systems as management tools that ensure that resources are obtained and spent efficiently and as tools for improving business processes and achieving business objectives. business, not only as tools intended for control. Another study demonstrates that the context in which performance measurement is used is changing, presenting emerging future trends and exploring how current performance measurement knowledge can address the emerging context, within a holistic systems-based framework, recognizing the integrated and concurrent nature of the challenges faced by practitioners and consequently the field (Bititci et al., 2012).

From the cluster analysis, based on the map mapped in figure 2, we can appreciate the fact that, in the specialized literature, which addresses the company's performance measurement systems, there are established concepts, which are constantly developing, offering perspectives on trends and contextual changes that include multi-criteria aspects regarding performance measurement, invoking the need for performance measurement systems to incorporate the dimensions of sustainability in business. The literature review undertaken also provided a holistic research framework for measuring performance in the context of emerging, integrated, global and business trends, by describing various models, for the integration of sustainability measures in the areas of global performance indicators.

V. CONCLUSION

The importance of using key performance indicators is found through their application in many fields: the health system, the construction field, the public transport system, the supply chain network, human resources, etc.According to specialized literature, the calculation and interpretation of a single indicator cannot serve to assess the performance of an entity, this process presupposing the analysis of a diverse set of performance indicators. Following the bibliometric analysis, we can observe that in most of the studies carried out on the "company performance measurement system" theme, the prevailing idea is that performance measurement instruments must contain, in addition to financial and non-financial aspects, intended to help management put the strategy into practice. It is about a performance measurement system, derived from the organization's objectives and strategy, which reflects the most important key aspects of the business, integrated into the organization's information system. Determining the degree of performance of organizations begins with the identification of specific indicators that allow a detailed quantification of process performance. Thus, it is found that measuring the performance of an organization is a criterion of inter-complex relationship between effectiveness, efficiency, quality, productivity, profitability, satisfaction.

Along with BSC and KPI, systems based on business intelligence (BI) are indispensable for any organization in carrying out its activity, especially since relevant decisions are made by managers based on the information provided by these systems, they increasingly emphasize on the importance of measurement systems within the organization.

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