



Integrating a behavioral aspect when developing the structure of a controlling system oriented towards increasing a company's value

DAIVA TAMULEVIČIENĖ , RASA SUBAČIENĖ***

Abstract

The introduction of a controlling system by using the potential of internal capabilities could be a determining factor that ensures an increase in a company's value. The behavioral aspect is also essential when developing such a controlling system. However, the structure of the controlling system in the scientific literature is not fully analyzed, and the importance of the behavioral aspect and its integration into the system as a distinct element is ignored. The aim of the study is to develop a structure of a controlling system oriented towards increasing the company's value by integrating elements that reflect the behavioral aspect of the system. The results of the study revealed that the controlling environment, including the behavioral aspect, must be the background for any controlling system. Therefore, the subsystem of the controlling environment that reflects the behavioral aspect should be identified as an element of the highest level of the hierarchy of the system that influences the functioning of other subsystems. The following elements can be appropriately assigned to the subsystem of a controlling environment: 1) the principles, 2) the organizational structure, 3) the management style and 4) the philosophy and culture of the organization. Taking into account the fact that strategic and operational controlling are essential types of controlling, the proposed subsystems of a second hierarchy level should be strategic controlling and operational controlling. Subsystems of the object, subject, functions, and process of controlling, as well as the methodological-instrumental subsystem, should be assigned to the third hierarchy level of the controlling system.

Keywords: controlling system, behavioral aspect in controlling, the structure of system of controlling.

Streszczenie

Integracja aspektu behawioralnego w rozwoju struktury systemu controllingu zorientowanego na wzrost wartości przedsiębiorstwa

Wprowadzenie systemu controllingu poprzez wykorzystanie potencjału wewnętrznych możliwości mogłoby być czynnikiem decydującym o wzroście wartości przedsiębiorstwa. Aspekt behawioralny jest również istotny w rozwoju takiego systemu controllingu. Jednak jego struktura w literaturze naukowej nie jest w pełni analizowana, a znaczenie aspektu behawioralnego i jego integracji z systemem, jako odrębnego elementu, jest ignorowane. Celem artykułu jest opracowanie struktury systemu controllingu

* Daiva Tamulevičienė, doctor of social sciences, associate professor, Vilnius University, Faculty of Economics and Business Administration, Department of Accounting and Audit, ORCID: 0000-0002-0187-037X, Daiva.Tamuleviciene@evaf.vu.lt

** Rasa Subačienė, doctor of social sciences, professor, Vilnius University, Faculty of Economics and Business Administration, Department of Accounting and Audit, ORCID: 0000-0001-6559-8478, Rasa.Subaciene@evaf.vu.lt



zorientowanego na wzrost wartości przedsiębiorstwa przez integrację elementów odzwierciedlających behawioralny aspekt systemu. Wyniki przeprowadzonego badania wykazały, że środowisko controllingu, w tym aspekt behawioralny, musi stanowić tło dla każdego systemu controllingu. Dlatego podsystem controllingu środowiska, odzwierciedlający aspekt behawioralny, powinien być identyfikowany jako element najwyższego poziomu hierarchii systemu wpływający na funkcjonowanie innych podsystemów. Następujące elementy można odpowiednio przypisać podsystemowi controllingu środowiska: 1) zasady, 2) strukturę organizacyjną, 3) styl zarządzania oraz 4) filozofię i kulturę organizacji. Biorąc pod uwagę fakt, że controlling strategiczny i operacyjny są podstawowymi typami controllingu, proponowane podsystemy drugiego stopnia hierarchii powinny być strategicznym i operacyjnym controllingiem. Podsystemy obiektu, podmiotu, funkcji i procesu controllingu oraz podsystemu metodyczno-instrumentalnego powinny być przypisane trzeciemu hierarchicznemu poziomowi tego systemu.

Słowa kluczowe: system controllingu, aspekt behawioralny w controllingu, struktura systemu controllingu.

Introduction

In a competitive market and with economic globalization, business management processes are becoming more and more complex, and the number of alternative options for decision making has grown, as has their level of complexity. These changes determine the fact that companies have to create and introduce new management systems and apply innovative methods to help them not only collect, process, systematize, and coordinate huge amounts of data, but also to reveal unsatisfactory situations inside the company quickly and detect what caused them. Another significant factor is that in the rapidly changing business environment, value creation becomes very important for most companies. Increasing value has become the managers' main objective when ensuring the needs of current and future investors, as well as balancing members' interests. And although the past few decades have been crucial for management theory, because various methods of how to increase management efficiency have been presented and applied in practice, most of them are oriented towards improving a particular management function.

One such system that helps spot problems and deals with them in an integrated manner is controlling, which could be called an innovative system that is applicable in a competitive market and in a dynamic business. It combines planning, control, information provision, accounting, and analyzing activities to achieve strategic and operational goals and to ensure the growth of a company's value in the long term. Introducing such a system could be a determining factor that ensures a company's success. Studies conducted by many authors (Špac, Mašnja-Škare, 2009; Papp, Pajrok, 2010; Śliwczyński, 2011; Sestanj-Peric, Kukec, 2012; Bieńkowska, Zgrzywa-Ziemak, 2014; Vuko, Ovján, 2013; Dobroszek, 2015; Perović et al., 2016; Todorović-Dudić et al., 2017, etc.) confirm that introducing a controlling system helps to improve the functionality of companies and the process of decision making as well as to increase the company's growth. Taking into account the fact that the company itself has no direct influence on its value, it is important to affect the processes that determine the success of

how the company's value changes, i.e., the value creation process depends on the success of optimizing individual processes. Special attention must be paid to coordinating both the main (product manufacturing/service production, selling to the customer, after-sales service) and the supporting (management, planning, control, accounting, analyzing, and activity evaluation) processes in an organization. This rigorous approach that combines production, management, accounting, and other elements is crucial when developing the company's controlling system, which is oriented towards increasing the company's value. However, aiming to manage the company by focusing on maximizing its value does not guarantee the growth of its value. The organizational philosophy, culture, fundamental values, and management style must be balanced by taking the main goal of the company – the growth of its value – into account as well. This is especially important in modern, socially responsible organizations where the principles of sustainable accounting and behavior-based management prevail.

The significance of the behavioral aspect in contemporary management has been analyzed by many authors (Wall, 2013; Indabawa, Uva, 2014; Žaptorius, 2017). They note that the behavioral approach to management focuses on human relations and employees' well-being. Rather than simply setting tasks and demanding that they be implemented, the behavioral-style manager helps to create conditions which keep workers satisfied and motivated. Social factors and psychological motivations are of more importance than financial incentives. This approach assumes that the worker wants to work, and that if the manager provides the right environment, productivity will succeed.

The behavioral aspect is also essential in developing a controlling system, oriented towards increasing a company's value. However, it is important to note that the structure of the controlling system in the scientific literature has not been fully analyzed and the importance of the behavioral aspect and its integration into the system as a distinct element is ignored. Considering the changes in organizational management and the rapid development of controlling theories, it is necessary to examine the structure of a controlling system oriented towards increasing the value of the company and to add new elements to it, evaluating the behavior of the external and internal members of the organization.

The aim of the study is to develop a structure of a controlling system that is oriented towards increasing the company's value by integrating elements that reflect the behavioral aspect of the system. The following goals were set to achieve this aim: 1) analyze the structure of the controlling system oriented towards the company's value growth and the elements that comprise it, as well as the connections among them; 2) examine the significance of the controlling environment subsystem and its element composition in the context of the behavioral aspect; 3) design a structural scheme of a controlling system by integrating elements that reflect the behavioral aspect; 4) evaluate the reliability of the designed structural scheme of controlling system by testing it empirically.

The research methods included analyzing the latest scientific literature from various authors; investigating methods of information comparison, systematization, elaboration, and generalization; the expert evaluation method; descriptive statistics.

1. Analysis of the controlling system structure

Controlling is an efficient informative system that can provide managers with the data needed for efficient management decisions. A properly designed controlling system can provide a variety of information on all the areas of activity, ensure the development of the company, and increase its value. In order to analyze and develop the structure of the controlling system, it is necessary to identify the features that characterize the systems.

As Norvaišas (2007) points out, every system is a group of elements that interacts with each another and acts together to achieve the desired goal. Every system has certain characteristic features (see Table 1).

Table 1. Main features characteristic of systems, and their description

The features of the system	Description
1. The system must be comprised of <i>elements</i>	Elements are structural parts that can be unambiguously identified.
2. The system must consist of several <i>hierarchical levels</i>	Separate elements of the system can also be considered to be systems themselves (or subsystems, to be precise) and thus it is important to identify the hierarchical level to which they belong. A system can be influenced by systems of the same or higher levels whereas systems of lower levels have less influence.
3. The elements must be related via <i>connections</i>	Separate elements that do not interact with each other and that do not influence one another do not comprise a system. Due to the connections among the elements that comprise the <i>structure</i> of a system, the system becomes more than a set of separate and completely independent elements.
4. The system must have <i>boundaries</i>	The boundaries separate the system from its environment and ensure its identity because it can then be singled out from a larger system. The connections of a system to its environment is supported via the elements that are at the boundaries of the system. Boundaries are more or less "permeable", i.e., the boundaries do not separate the elements of the system from the ones that do not belong to the system permanently, so the boundaries might change.
5. The system must be <i>dynamic</i>	The status of the system elements (not necessarily all) changes over time; thus one can witness different types of behavior of the system.
6. The system must have a <i>goal</i>	The status (behavior) of the system must be closely related to the goals of the system.

Source: authors' own compilation based on Tidikis (2003), Norvaišas (2007), Padriezienė, Kvedaravičius (2010).

As we can see from Table 1, each system must be composed of elements, i.e., from structural, unambiguously identifiable parts of the system. There are many authors who

have analyzed the elements of the controlling system (Benčová, Kalavska, 2009; Боргардт, Вишнякова, 2015; Ciurlău, 2016; Horváth, 2011; Reichmann, 2011; Kah, 1994; Климович, 2013; Malmi, Brown, 2008; Schuh, Kramer, 2016; Жакевич, 2016, etc.). However, there is no unanimous opinion – neither on the controlling system structure nor on the elements comprising it and the interactions among them. Nonetheless, it is possible to recognize a certain general agreement because most of the authors agree that controlling ought to be analyzed as a system comprised of two main parts: strategic and operational controlling. However, their approaches to other system elements, sub-systems, and the direct and reversible links between them differ.

It should be noted that some of the authors provide a conceptual rather than structural view of the structure of a controlling system and its elements, i.e., they analyzed a certain aspect of the controlling system rather in a comprehensive way (see Table 2). For instance, Benčová and Kalavska (2009) point out that the controlling system is comprised of five processes. Such a view is too narrow because the authors did not analyze the system through a holistic approach, considering it to be a combination of various aspects, but only through the prism of the process. Kah (1994), Jusupova (Юсупова, 2008), and Schuh and Kramer (2016) present the controlling system as the entirety of other separate systems, but they do not provide a more detailed description of these systems nor of the connections between them. The study carried out by Ciurlău (2016) ought to be noted as well; the author assigned three elements to the controlling system: information, indicators, and tools. Even though the author did not present the connections between these elements in the visualization of the controlling system she recommends, in the description, she noted that the controlling system determines the respective indicators needed for management by using certain information and tools.

Table 2. The elements of a controlling system

Author	Elements of a controlling system
Benčová, Kalavska (2009)	1) production process; 2) manufacturing cost standards and objectives for operations anticipation process; 3) revenue analysis process; 4) budgeting process; 4) communication process
Kah (1994)	1) planning system; 2) control system; 3) information provision system; 4) motivation system; 5) organizational system
Jusupova (2008)	1) strategic management system; 2) planning and budgeting system; 3) management accounting system; 4) responsibility accounting system; 5) information provision system; 6) financial and performance analysis system; 7) system of disclosing causes of variances
Schuh, Kramer (2016)	1) planning of objectives; 2) analysis of the achievement of the objectives; 3) cause analysis and interpretation; 4) corrective actions
Ciurlău (2016)	1) information; 2) indicators; 3) tools
Malmi, Brown (2008)	1) planning; 2) cybernetic; 3) reward and compensation; 4) administrative; 5) cultural controls

Source: authors' own compilation.

Malmi and Brown (2008) regard the control system through the prism of management functions. The authors provide a new typology for controlling, which is structured around five groups: planning, cybernetic, reward and compensation, administrative, and cultural controls. The typology is based on the distinction between decision-making and control, and it addresses those elements managers use to direct employee behavior. It is important to note that these authors were among the first to draw attention to the behavioral aspect of the controlling system. This is especially true of the cultural control and reward and compensation control elements. Cultural control is formed through social systems to influence the behavior of each actor. It includes such items as “clan” control, value control, and symbol control. Malmi and Brown (2008) state that there are distinct subcultures within organizations. These subcultures, or micro-cultures or individual groups, can be labeled “clans.” The concept of a clan in control research rests upon the idea that individuals are exposed to a socialization process that instills a set of skills and values in them. Clan controls work by establishing values and beliefs through the ceremonies and rituals of the clan. The concept of value controls can be described as a belief system. It is defined as an explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic values, as well as a purpose and direction for the organization. Symbol-based control elements are when organizations create visible expressions, such as building/workspace design and dress codes, to develop a particular type of culture. Reward and compensation control are based on motivating and increasing the performance of individuals and groups through attaching rewards to control effort direction, effort duration, and effort intensity.

When analyzing the structure of a controlling system, it is important to note that Russian scientists Borgart and Vishniakova (Боргардт, Вишнякова, 2015), Klimkovich (Климкович, 2013), Zhakevich (Жакевич, 2016) and others have contributed significantly to the study of the controlling system elements and the formation of its structure. It is directly related to developing trends of classic controlling concepts – *controlling as part of the management system* – which were particularly supported by the representatives of the Russian school. Tamulevičienė (2018) carried out a detailed analysis of the controlling system structure by various Russian scientists and concluded that the authors could not agree unanimously on a structure of the system elements and their hierarchical position. Table 3 presents a set of the controlling system elements proposed by Russian scientists and systematized by Tamulevičienė (2018). When developing this set, only the elements of the first hierarchical level of the controlling system were included.

It is important to note that the importance of the behavioral aspect in the composition of the controlling structure has not been emphasized. However, in modern, socially responsible organizations, where the principles of sustainable accounting prevail, the behavioral aspect is very significant. Therefore, it is important to form such a structure of a controlling system which integrates as separate elements of the system the influence of the organization’s members’ behavior on the organization’s activities and results, as well as the management system’s influence on the behavior of those members.

Table 3. A set of the highest hierarchical level elements in a controlling system in the works of Russian authors

Elements	Authors											
	Fufigina, 2006	Guseva, 2008	Borovkova, Boikova, 2009	Nechuhina, 2010	Shveikert, 2011	Shomenko, 2011	Krasilnikov, 2011	Laptev, Potapova, 2012	Asaul, Kvicinaja, 2013	Klimkovich, 2013	Borgart, Vishniakova, 2015	Zhakevich, 2016
Subject			+		+						*	*
Object			+		+						*	*
Methodology			+	v				+		*		
Provision			+							*		
Process								+		*		
Structure	v				+			+		*		
Technique								+				
Tasks	v			v	+				v			
Information support	v			v								
Methods	v			v								
Concept				v	+	v						
Principles	v			v							*	
Functions	v			v	+	v					*	
Goals	v			v	+	v					*	
Instrument	v				+				v		*	
Movement of documents	v											
Organization									v			
Operational controlling		*										*
Strategic controlling		*										*
Standards					+							*
Development and supply						v						
Technology						v						
Personnel						v						
Planning							v					
Management accounting							v					
Marketing							v					

* author divides the system into a three-level hierarchical structure; + – author divides the system into a two-level hierarchical structure; v – author divides the system into a one-level hierarchical structure.

Source: Tamulevičienė (2018).

For this purpose, one must first determine the recommended number of hierarchical levels, since this is one of the necessary conditions for the development of any system (see Table 1). Because complexity, multi-dimensionality, and multiple layers are characteristic of controlling, a system whose structure is comprised of one or two hierarchical levels would be too simple and would not reveal the most important aspects and connections between the elements of the system. Therefore, it is appropriate to develop a system of three or more levels. Even though a higher number of levels would better reflect the complexity of controlling, it would be difficult to develop a model of such extensive systems and to apply them in practice afterward. Thus, an optimum controlling system should be comprised of three hierarchical levels. *Subsystems* should be considered elements of the system; those subsystems that have an impact of the subsystems of lower levels should be assigned to the highest level of the system.

Some of the studied authors also recommend developing a three-level hierarchical controlling system (Гусева, 2008; Климович, 2013; Боргардт, Вишнякова, 2015, Жакевич, 2016). They recommend attributing the following elements to the first (highest) hierarchical level of the controlling system: subject, object, methodology, supply, process, structure, principles, functions, goals, instruments, strategic controlling, and operational controlling. However, such a hierarchical system would not be completely accurate because it ignores the behavioral aspect. The behavior of external and internal members, and the environment in which they act, influence the functionality of the listed elements in every company. Hence the elements mentioned must become independent subsystems (or integral parts) of a lower level whereas the subsystem of controlling environment should be considered the highest-level independent element. Although the studied authors did not single out such an element, it is nonetheless necessary for the system to work effectively. This suggestion is based on the fact that most systems of every organization function in a certain environment which influences the functioning of other elements of the system.

2. The subsystem of the controlling environment as an essential element of the controlling system in the context of the behavioral aspect

Actions, policies, values, management styles, and other conditions influence and determine a company's daily activities. Studies by authors that have analyzed other organizational systems reveal this. For example, Kanapickienė and Razmutė (2009), Dzingulevičienė and Kustienė (2010), Giriūnas and Mackevičius (2013), and many others who have studied control, internal control, performance evaluation, and audit systems singled out the element of the environment as an essential element of the system which influences other elements. Thus, given that controlling is considered an extensive, multi-functional system comprising various fields of activities, integrating the element of the controlling system environment is necessary and must be considered an element

of the highest hierarchical level system. The controlling environment is an environment where the controlling activity is carried out and where controllers carry out their functions as well as implement the strategic and operational goals of the company. The controlling environment, including the behavioral aspect, must be the background for any controlling system.

When preparing the structure of a controlling system that is oriented towards increasing a company's value, the following elements can be appropriately assigned to the subsystem of the environment: 1) the *principles*, based on which the controlling system has to be developed and realized; 2) *organizational structure*, which would meet the conditions of implementing the controlling system; 3) the respective *management style* and 4) the *philosophy and culture* of the organization.

The principles of the controlling system are certain rules that define the behavior of controllers in order to ensure the implementation of the controlling system functions. Three out of the twelve studied authors singled out the principles as a necessary element of the highest-level controlling system (see Table 3); however, only Borgart and Vishniakova (Боргардт, Вишнякова, 2015) named them: systematicness, complexity, procedural implementation, and scientific reasoning. It is noteworthy that the recommended list of controlling system principles had been published slightly earlier by Falko (Фалько, 2008). In his opinion, a controlling system in development must be based on these principles: validity, complexity, timeliness, universality, effectiveness, reliability, concreteness and focus; however, he did not carry out a more in-depth analysis.

There are suggestions to revise this list by attributing the principles of validity, suitability, complexity, integrity, focus, timeliness, objectivity, effectiveness, and competence to the controlling principles (see Table 4). Compliance with these principles would ensure the effective functioning of the controlling system.

Table 4. Principles of the development and realization of a controlling system as well as their provisions

Principle	Most important provisions
<i>1. Validity</i>	Methods, measures, and instruments applied in the controlling system must be chosen in a valid manner to ensure that proper management decisions are made.
<i>2. Suitability</i>	The controlling system that is being developed must meet the company's needs, i.e., the size, type of activity, level of decentralization and style of management of the company as well as other circumstances must be taken into account.
<i>3. Complexity</i>	Tasks set for the controlling system have to be solved in a comprehensive manner, i.e., by estimating the company's economic, financial, and organizational situation, choosing a set of methods, measures, and instruments that match together to solve problems, and applying a set of financial and non-financial indicators to assess results.

Table 4. (cont.)

Principle	Most important provisions
4. <i>Integrity</i>	The controlling system must encompass all functional areas of a company's activity.
5. <i>Focus</i>	The controlling system must be focused on achieving strategic goals as well as solving operational and tactical tasks.
6. <i>Timeliness</i>	The controlling system must present relevant results, i.e., exactly when they are needed to make management decisions.
7. <i>Objectivity</i>	The results provided by the controlling system must be reliable.
8. <i>Effectiveness</i>	The controlling system must function in such a way as to ensure efficient and necessary results that provide the maximum benefit, thus making the management system more effective.
9. <i>Competence</i>	Professional and highly competent employees must be responsible for the development and effective functioning of the controlling system after they receive the necessary professional skills and have respective personal character features.

Source: authors' own compilation.

The second and third elements of the subsystem of the controlling environment define an organizational structure which meets the conditions of introducing a controlling system and respective management style. The controlling system can function effectively in companies with a high level of decentralization, led by a democratic leader who delegates responsibility to subordinates. The decentralization of management means assigning certain rights, responsibilities, and powers to lower managers (Roehl-Anderson, Bragg, 2004; Lakis et al., 2010; Hauser, 2011; Tamulevičienė, 2014). Although decentralizing management has not only advantages but also disadvantages, the introduction of a controlling system is recommended in decentralized organizations where certain rights and responsibilities are assigned to lower-rank managers. However, it should be noted that the level of decentralization may vary from company to company. Only in exceptional cases can an organization be fully centralized or decentralized, while the most realistic management option is a combination of centralization and decentralization.

The organizational culture and philosophy is the last suggested environment subsystem aspect of the controlling system, oriented towards increasing a company's value. As stated by Vaitkūnaitė (2006), organizational culture is the behavior, ethos, and external image (such as organizational structure, symbols, etc.) of the company (its employees), shaped by its employees interacting with each other as well as the external environment and expressing only the attitudes, beliefs, and values that are characteristic of the employees of the company. Therefore, when forming a controlling system, it is important to take the company's values into account, so the goals set, and the proce-

dures and tools selected to achieve them, do not contradict the existing culture and philosophy of the organization. The importance of the organizational culture is also highlighted in Malmi and Brown (2008), where the organizational function of a controlling system is presented as one of the components of the control function.

The proposed first-level subsystem of a controlling environment that includes the behavioral aspect and its elements is recommended when developing a structure of controlling system for all types of companies regardless of their size, type of activity, or legal form since the main principles, organizational structure, management style, and culture of the company have to be defined in every company that is going to introduce a controlling system.

3. Other elements of a controlling system and their position in the structure of the controlling system, oriented towards increasing a company's value

A review of scientific sources (Rickards, 2005; Карминский et al., 2006; Dimov, Iliev, 2010; Horváth, 2011; Śliwczynski, 2011; Oleiniuc, 2012; Zéman et al., 2013; Gleißner et al., 2013; Bieńkowska, Zgrzywa-Ziemak, 2014, etc.) revealed that the main types of controlling are strategic, tactical and operational. The purpose of strategic controlling is to ensure that the right activity is being done, while the purpose of operational controlling is to ensure that the activity is being done right. The synthesis of strategic and operational controlling makes it possible to create a company's value. Tactical controlling strengthens the interaction between strategic and operational controlling by ensuring a direct link and feedback of both the strategic and operational controlling. The question "How should we do the activity right?" expresses the direct link, whereas the question "What should be done when the wrong activity is being done, or the activity is being done wrongly?" expresses feedback. Since strategic and operational controlling are essential types of controlling, the proposed subsystems of the second hierarchy level are strategic controlling and operational controlling. Tactical controlling takes place in the system as a connecting part of strategic and operational controlling, ensuring the interaction of these elements of the system with both direct links and feedback.

Authors analyzing strategic and operational controlling (Rickards, 2005; Śliwczynski, 2011; Oleiniuc, 2012; Zéman et al., 2013; Bieńkowska, Zgrzywa-Ziemak, 2014, and others) focused more on the aspect of classification; however, they all noted that implementing the controlling system in practice starts from clearly and concretely worded strategic and operational goals which are achieved by allocating the functions of controlling and selecting the respective procedures, instruments, etc. Taking into account the features of strategic controlling, it is appropriate to identify the following elements of the strategic controlling subsystem: 1) the creation of long-term strategies, and 2) the formulation of strategic objectives. Respectively 1) setting short-term objectives and

2) formulating short-term tasks are considered elements of the operational controlling subsystem.

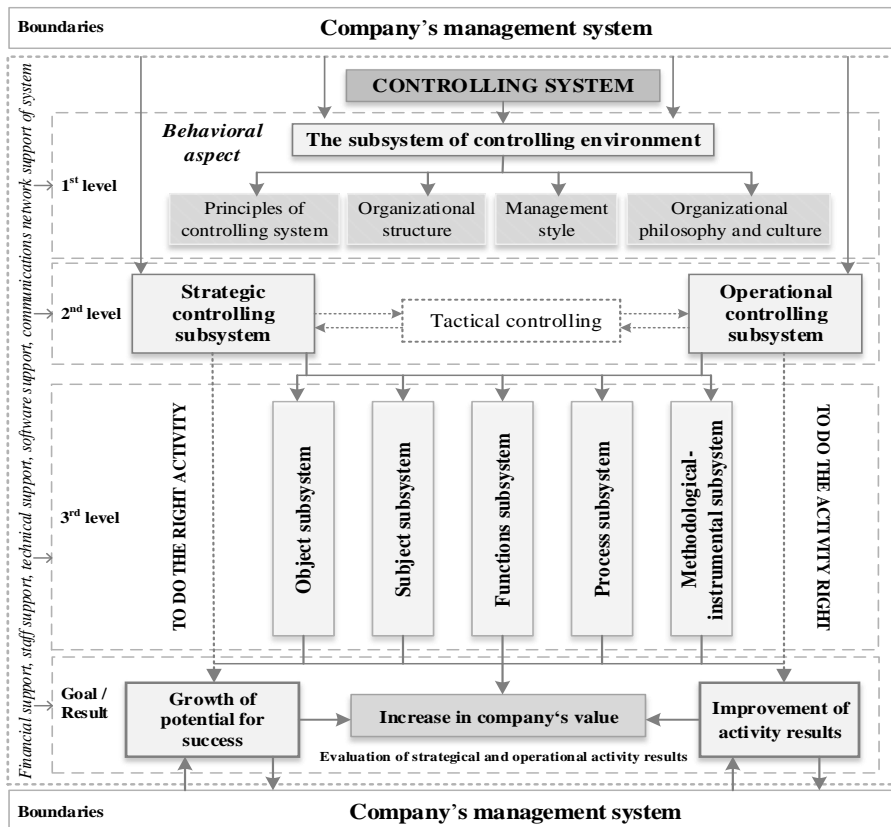
It is noteworthy that the subsystem of the controlling environment, by being at a higher hierarchical level, influences the strategic and operational controlling subsystem because the principles of controlling, organizational structure, and organizational culture, philosophy, and management style are important factors when developing the goals of the organization.

At the third hierarchical level of the controlling system, it is appropriate to develop subsystems that help to achieve the strategic and operational objectives set at the second level. First of all, the *object subsystem* should be distinguished. The subsystem of the object of a controlling system indicates which elements are controlled by the system. It is also necessary to distinguish the *subject subsystem*, which defines the subjects of the company which are responsible for the introduction and functioning of the system and the implementation of strategic and operational tasks. As a very important and necessary element of the third hierarchical level of controlling system, it is recommended to distinguish the functional subsystem. This subsystem defines which strategic and operational tasks must be assigned to the system, what the role of the subjects in the system is, and what responsibilities they have. The *process subsystem* and the *methodological-instrumental subsystem* should be distinguished as separate, autonomous elements of the controlling system as well. The subsystem of the process predicts a set of strategic and operational activities which transform resources into the result of a controlling system. The methodological-instrumental subsystem determines a set of methods, approaches, and measures which should be applied by a controlling subject during the controlling process while implementing controlling functions. Given that some of the analyzed authors (see Table 2) singled out controlling system elements related to provision (provision; information support; the movement of documents; development and supply), it is appropriate to bring these elements together by singling out a separate element – system provision – but without giving it a position of the subsystem. Such a decision is based on the presumption that the purpose of the financial support, staff support, technical support, software support, communications network support of the system is to enable all the elements of the system to function regardless of their hierarchical position.

The analysis of the structure of a controlling system makes it possible to identify the necessary elements (subsystems) of the controlling system, to define the hierarchical levels, and to reveal the links between them, as well as to integrate the behavioral aspect for the first element of the controlling system. Also, when developing a controlling system, it is important to evaluate other specific features of the system as well, which are provided in Table 1, such as the *dynamics of the system*, *goal prediction* and the *boundary definition* of the system. The reflection of the first feature would mean that the controlling system of any company will never be static due to the permanent change of some elements over time. First, it concerns the subsystems of strategic and operational controlling, when the company has to constantly review its objectives, taking into account external and internal conditions, for which new tasks have to be formulated, new instruments have to be selected, and other procedures have to be envisaged and functions revised.

The controlling system also has a clearly defined goal, which is expressed through a specific result – an *increase in the value of the company*. How well the controlling system achieves this goal must be evaluated in two aspects: 1) in the prism of the strategic controlling subsystem as the *growth of potential success*; 2) in the prism of the operational controlling subsystem as an *improvement of the operational performance*. And finally, controlling, like every other system, must have limits, i.e., boundaries, which must ensure the identity of the system and distinguish it from a larger system. In this case, the controlling system has clearly defined boundaries as it is an integral part of another, larger system – organization management. The “permeability” of the boundaries is carried out through the organization’s management system communicating with the controlling system and the direct influence on the boundary elements of the controlling system (the controlling environment subsystem, the strategic controlling subsystem, and the operational controlling subsystem). Figure 1 presents a structured scheme of the controlling system architecture that depicts elements of the controlling system, its hierarchical levels, the relationships between them, its purpose, and the boundaries of the system.

Figure 1. Structural scheme of the controlling system



Source: authors' own compilation.

The prepared structure of a controlling system shows a generalized view of a controlling system; therefore, it can be used as an exemplary structure for all types of companies planning to form a controlling system, regardless of their size, type of activity, legal form, or other features. Every company should also include the environment subsystem of the first hierarchical level as well as the following elements: the principles of a controlling system; organizational structure; management style; the philosophy and culture of an organization. It should also include the strategic and operational controlling subsystems of the second hierarchical level and their respective elements: the creation of long-term strategies and the formulation of strategic objectives; and the identification of short-term objectives and the formulation of short-term tasks. The structure and contents of the third hierarchical level subsystems elements, as well as the indicators and criteria applicable for assessment of the system results, may vary depending on the company.

4. Methodology and study results of an expert evaluation

In order to evaluate the validity of the recommended structural scheme of a controlling system oriented toward increasing a company's value, an empirical study was carried out using the expert evaluation method. The expert evaluation is a procedure that makes it possible to harmonize the opinions of different experts and make a mutual decision (Augustinaitis et al., 2009). The expert evaluation was carried out using the scale estimation method, and the sample size was selected by the non-probability sampling technique by integrating purposive (judgment) and convenience sampling methods. Taking into account the sample size recommended in the literature (Pranulis, Dikčius, 2012; Tidikis, 2003; Augustinaitis et al., 2009), nine experts were selected for the expert evaluation. To process and analyze the data of the expert evaluation, the statistical functions of Microsoft Excel software, based on descriptive statistics methods, were applied.

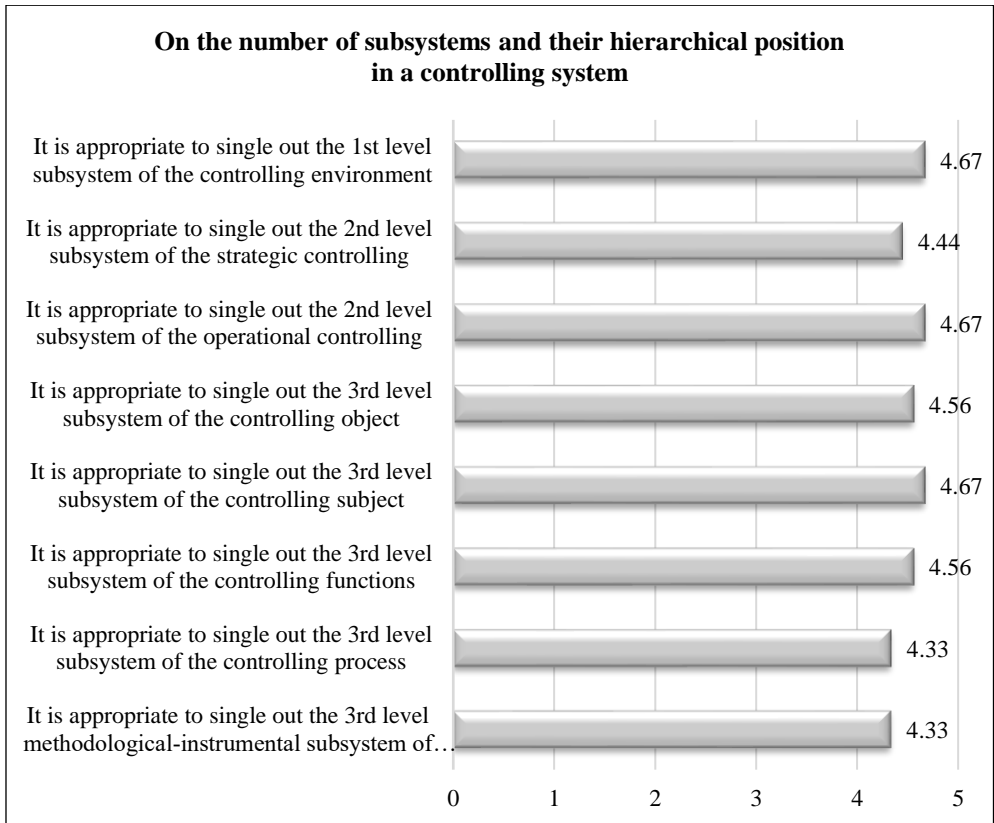
The expert evaluation of the structural scheme of the controlling system oriented towards increasing the company's value was carried out by experts submitting a list of statements that describe the elements of a controlling system. The experts were asked to express their agreement/disagreement with the submitted statements on a 5-point Likert scale, where 1 means that the expert completely disagrees with the statement; 2 – disagrees; 3 – neither agrees nor disagrees; 4 – agrees; 5 – completely agrees.

Nine groups of statements were presented to the experts to evaluate the validity of the architecture of the controlling system and the elements of the subsystems for the first, second, and third hierarchical levels. The first group of questions was designed to find out whether a controlling system consisting of three hierarchical levels of subsystems is reasonable. Figure 2 presents the average of the experts' agreement on the statements.

The data in Figure 2 shows that the experts' level of agreement on all provided statements is very high, i.e., the experts completely agree or agree with the suggested number of controlling subsystems and their hierarchical position in the system (the average of all first group statements is 4.46). The average level of agreement of the first statement is 4.67 (mod – 5; median – 5): seven of nine experts completely agree that in order to develop a controlling system it is appropriate to distinguish a subsystem of the *controlling*

environment that integrates the behavioral aspect as a subsystem with a top-level (first level) position in a hierarchical structure. This is because each system operates in a particular environment, which affects the functioning of other systems. Thus, the subsystem of the controlling environment integrating the behavioral aspect proposed by the authors is valid.

Figure 2. The results of estimating the agreement on the validity of the proposals on the number of subsystems and their hierarchical position in a controlling system



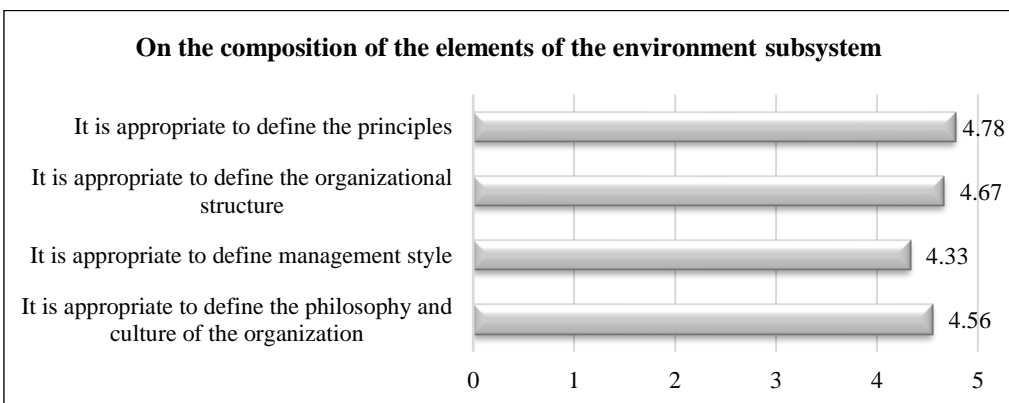
Source: authors' own compilation.

The same number of experts agree that operational controlling should be distinguished as a second level sub-system, as it is one of the most important types of controlling responsible for the implementation of short-term tasks. The level of agreement on assigning the strategic controlling sub-system to the second level in the hierarchical structure is slightly lower and accounts for 4.44. Six experts completely agreed with this statement, whereas one expert agreed, and two experts neither agreed nor disagreed. One of them agreed with the statement partly, since, in his opinion, the subsystem of strategic controlling should be assigned to the first level position in the hierarchical structure of the controlling system.

The purpose of the other five statements of the first group was to evaluate the structure of the elements of the third hierarchical level subsystems of the controlling system. The experts provided their opinion on the validity of five subsystems of the controlling system: 1) the *object* subsystem; 2) the *subject* subsystem; 3) the *functions* subsystem; 4) the *process* subsystem; 5) the methodological-instrumental subsystem. The level of agreement on including these subsystems in the controlling system is high (the average evaluation ranges from 4.33 to 4.67) which substantiates the necessity to include the subsystems in the system. The experts did not provide an opinion on supplementing the controlling system with other subsystems; therefore, it is considered that the development of the subsystems and their hierarchical position in the structure of the controlling system are reasonable.

The experts were asked to estimate the composition of the elements of the environment subsystem by using the second group of statements (see Fig. 3). In order to integrate the behavioral aspect into the controlling system, which is oriented towards increasing the company's value, four elements of the subsystem of the controlling system environment were singled out: 1) *the principles of the controlling system*; 2) *the company's organizational structure*; 3) *the management style*; 4) *the philosophy and culture of the company*. All experts expressed complete agreement or agreement with the proposed elements except for one expert practitioner who had no clear opinion. Also, one expert expressed his opinion that he completely agrees with the composition of the proposed elements but offers leaving companies the possibility to single out more elements of the environment subsystem, depending on the company's internal and external features, the company's position in a competitive market, and its goals. Considering that no concrete propositions on new elements to be added to the analyzed subsystem were given, and experts' average evaluations on the recommended environment subsystem elements range from 4.33 to 4.78 points, one can state that the elements were included into the model reasonably.

Figure 3. The results of estimating the agreement on the validity of the proposals to include elements of the environment subsystem into the controlling system



Source: authors' own compilation.

Other questions the experts were asked related to the validity of the details of the second (strategic and operational controlling) and third (object, subject, functions, process, methodological-instrumental) levels of the elements of the subsystems of a controlling system, as well as their inclusion in the development of a controlling system oriented towards increasing a company's value. The experts agreed or completely agreed with all statements; therefore, one can state that the developed structure of a controlling system is valid.

The results of the theoretical research and the assessment of the experts' opinion allow us to state that the development of any management system is influenced by the behavior of external and internal actors. On the other hand, any management system influences the behavior of those actors. Therefore, the development of such systems requires the integration of system elements which reflect the behavioral aspect. The architecture of the developed controlling system, oriented towards increasing the company's value, presents the element of the controlling environment which represents the behavioral aspect as well as its components, such as principles, organizational structure, management style, and organizational philosophy and culture. However, this is a non-exhaustive list of items. Companies could complement the environmental subsystem and other elements depending on the features of the company's external and internal environment, the company's position in the competitive market, and its goals.

Conclusions

1. Detailed analysis of the controlling system structure makes it possible to identify subsystems and elements of a controlling system oriented towards increasing a company's value as well as links between them. Taking into account the fact that controlling is a wide, multifunctional system that combines different fields of activities, the subsystem of the controlling environment that reflects the behavioral aspect was identified as an element of the highest hierarchy level of the system which influences the functioning of other subsystems. Because strategic and operational controlling are essential types of controlling, the proposed subsystems of the second hierarchy level are strategic controlling and operational controlling. Subsystems of the object, subject, functions, and process of controlling, as well as the methodological-instrumental subsystem are assigned to the third hierarchy level.

2. The controlling environment, including the behavioral aspect, must be the background for any controlling system. When preparing the structure of a controlling system which is oriented towards increasing a company's value, the following elements can be appropriately assigned to the subsystem of controlling environment: 1) the *principles*, based on which the controlling system has to be developed and realized; 2) the *organizational structure*, which should meet the conditions of implementing the controlling system; 3) the respective *management style*, and 4) the *philosophy and culture* of the organization. The proposed subsystem of the controlling environment and its elements

are recommended when developing a model of a controlling system for all types of companies, regardless of their size, type of activity or legal form, since the main principles, organizational structure, management style, and culture of the company have to be defined in every company that intends to introduce a controlling system. However, this is a non-exhaustive list of items. Companies could complement the environmental subsystem and other elements depending on the features of the company's external and internal environment, the company's position in the competitive market, and its goals.

3. The result of assessing the expert opinions allow us to state that the proposed structural scheme of the controlling system is valid. The experts agreed or completely agreed with all statements regarding the number of subsystems and their hierarchical position in a controlling system. They expressed a particularly high level of agreement for the inclusion of a subsystem of the controlling environment that integrates the behavioral aspect as a subsystem with a top-level position in the hierarchical structure. This proves that the development of controlling systems requires the integration of elements which reflect the behavioral aspect.

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