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Research of the Performance Measurement system: Environmental Perspective

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This article presents the results of empirical research performed in Lithuanian organizations. Theoretical background is based on assumptions that changing environment of organizational performance has a direct impact on changes in performance measurement, which, in its turn, are realized in close connection with projects on re-organizing internal management systems. The main feature of modern performance measurement system is putting the theoretical descriptive method into practices, incorporating it to decision making process, and improving the system according to changing external conditions and internal potential of an organization. Those processes mean organizational changes based on relations with the environment (Alas, Sharifi, & Sun, 2009; Ginevicius & Podvezko, 2009; Gudas, 2009). The dimensions that lead to the deeper analysis of relations between performance measurement system and environment of organization were disclosed in this article. In order to disclose those relations changes of the organizational system could be analyzed in the context of different theoretical assumptions – contingency and complexity theories. According to this aspect, changes of performance measurement system could be analyzed according to contingency theory, which will answer the question – what external environment is surrounding organization and influencing its internal environment. Complexity theory will answer the question - how organization reacts to its external environment.

Combining the main presumptions of complexity and contingency theories it could be maintained that the level of environmental uncertainty and organizations reactions to it could be dimensions according to which features and content of PMS in different organizations could be researched. Those two dimensions in different size organizations form different internal organization's environment peculiarities of which performance measurement system should be reflected.

In order to point out performance measurement changes according to environment of the organization, quantitative research (survey) was performed. Survey was performed in Lithuanian organizations, which were chosen by handily selection method. The purpose of the research is to analyze the usage of performance measurement system in Lithuanian organizations: what factors (internal, external) influence the changing process and frequency of performance measurement system according to different aspects of an organization.

Keywords: *complexity theory, contingency theory, performance measurement system.*

Introduction

A performance measurement system (PMS) is a set of metrics used to quantify both the efficiency and effectiveness of actions, to identify competitive position, locate problem areas, assist the company in updating strategic objectives and make tactical decisions to achieve these objectives, and supply feedback after decisions are implemented. (Gimzauskiene & Valanciene, 2005; Valanciene & Gimzauskiene, 2007; Strumickas, & Valanciene, 2009). It is important to contribute to a better understanding of the factors that affect the adoption and use of PMS in organizations and the relationship between these factors and performance measurement practices. In order to carry out this research study, a contingency approach was needed, i.e. based on the assumption that various factors influence performance measurement in organizations. This approach is not very common in the literature on PMS, but it is an essential starting point to understanding performance measurement in organizations. Contingency theory postulates that the effectiveness of the organization in coping with the demands of its environment is contingent upon the elements of various subsystems. Several authors suggest that a contingency framework may provide a more holistic approach to the design of PMS. But could contingency approach disclose peculiarities of PMS as a result of its continuous improvement? According to this aspect the second theoretical approach for PMS studies is complexity theory. The last decade complexity theory has been advocated as a way to help understand organizational reaction and innovation. PMS analyzed according to contingency and complexity theories will let us disclose how external environment and organizations reaction to it shapes internal environment and to what level it is reflected in PMS.

The **research question** of this article is: how does performance measurement system in different size organizations reflect its environment?

The object of this article is the methodological basis of performance measurement system (PMS).

The aim of this article is to disclose the dimensions of internal and external environment that influence performance measurement system.

The methodology of the paper includes two main parts. The development of a theoretical framework is presented in the first parts. Research (survey) in a Lithuanian organization is presented in the second part of this article.

Theoretical background and development of the hypothesis

Contingency theory and environment of organization. Contingency theory is one of the theories which help to analyze in what way PMS fits to organization's internal environment (Gimzauskiene & Kloviene, 2008 (a,b)). PMS studies are characterized by a contingency approach: each organization has to choose the most suitable system by taking into account some contingency variables (Garengo & Bititci, 2007), such as corporate governance structure, management information system (MIS), business models, organizational culture, and environment. (Biazzo & Bernardi, 2003) In the literature on PMS many normative models are proposed (Hudson, Smart & Bourne, 2001).

Summarizing it could be stated, that contingency theory postulates that the effectiveness of the organization is contingent upon the elements of various subsystems (Dumludag, 2009; Tvaronaviciene, Grybaite & Tvaronaviciene, 2009) – PMS is one such subsystem. Contingent theory is based on the premise that there is no universally appropriate accounting system which could be applied equally to all organization in all circumstances (Gimzauskiene & Kloviene, 2008 (a,b)). Efficiency and effectiveness of PMS depends on what level it ensures strategy measurement, evaluation and dissemination through functions and processes of organization and translation of it into operational terms in different management levels. This leads to the conclusion that environment is the most important variable which affects the choice of PMS as it affects strategy. On the other hand environment could be described according to the level of the uncertainty. The greater environment uncertainty the more difficult it is to configure the system for effective performance evaluation. Environmental uncertainties could not be explained using contingency theory alone as they influence PMS indirectly through internal organizational factors.

Complexity theory and external environment of an organization. The second theory which can explain organizational reaction and changes of PMS in organization is complexity theory (Rooney & Hearn, 1999; Valanciene, Gimzauskiene, 2008). The study of complexity reveals that they are in dynamic reaction with our environment and are very much part of the process that creates that environment (Brodbeck, 2002; Styhre, 2002). Complexity theory suggests that there is a quasi equilibrium state, just short of the point where a system would collapse into chaos, at which the system maximizes its complexity and adaptability (Houchin & MacLean, 2005; Miguel & Joao, 2006). This point is referred to in the literature as the edge of chaos (Letiche, 2000; Macbeth, 2002; Bechtold, 1997; Jenner, 1998; Tetenbaum, 1998; Smith, 2005; Burnes, 2005).

Complexity theory applied to organizations has been more seriously informed by understanding of the reaction to an environment. This enhanced the attractions of complexity theory as an integrative framework for understanding organizations' reaction. Talking about organizations' reaction to environment it means that all systems in an organization will also react less or more. This lets state that performance measurement system is one of such systems in organization the design of which depends on organization reaction. Summarizing it could be maintained, that complexity theory lets us study the process of changes and answer the questions - in what way does the organization deal with chaos and uncertainties at a particular moment and to what extent does it seek for stability and order?

Hypothesis of the research. Combining the main presumptions of complexity and contingency theories, it could be maintained that the level of external environmental uncertainty and organizations reactions to it could be dimensions according to which features and content of PMS in different organizations could be researched. Those two dimensions in different size organizations form different internal organization's environment peculiarities of which performance measurement system should reflect:

- Small organizations frequency of usage of performance measurement system tools is at the lowest level but extensive usage of performance measurement system tools is at the high level because its external environment forms low information demand.
- Medium size organizations frequency usage of performance measurement system tools is at the low level but extensive usage of performance measurement system tools is at the highest level because its external environment forms higher information demand.
- Large organizations frequency and extensive usage of performance measurement system tools is at the same high level because its external environment defines high informational demand.

Research method and results

Research method. In order to point out performance measurement changes according to environment of an organization, a quantitative research (survey) was performed. The survey was performed in Lithuanian organizations, which were chosen by handy selection method. In this research we analyzed the usage of performance measurement system in Lithuanian organizations: what factors (internal, external) influence the changing process and frequency of performance measurement system according to different aspects of organization and how performance measurement system fits to these changes.

General information about organizations (*the industry/sector in which organization operates, ownership structure, number of employees*) was analyzed first and one of the most important question to research results is the number of employees (< 50, 50-300, > 300) as it shows the size of organization.

External environment of organization was analyzed according to the frequency of changes, which means an environment is static or dynamic and in this case respondents need to mark frequency of listed changes using Likert scale (*changes in client needs, in product/ service priority characteristics, in pricing policy, in competitor's pricing policy, in product/service characteristics, in competitor's product/service characteristics, in technology of production, in life cycle of products, in competition, in strategy, in competitor's strategy, in market members, in new products market development*).

Reaction to environment was analyzed according to its complexity – an organization tries to absorb or simplify ongoing changes. Complexity was analyzed in two ways using yes/no answers. First, according to organization's reaction when performance results do not fit to its purposes. In this case respondents ought to check what changes are made in strategy, objective, tactic targets (*creates new strategy, creates and seeks new targets, corrects strategy, corrects targets and tactic tasks, identify not fitting problems, improves future activities*). Second, according to how many purposes organizations try to adjust (*individual employee's purposes, individual client purposes, director's purposes, shareholder's purposes, organization's purposes*).

In performance measurement methods case, using Likert scale, respondents first, ought to mark the frequency of different management accounting methods usage (*traditional accounting methods, activity based costing, strategic planning, pricing methods, middle period planning, budget planning, balance scorecard, analytic methods*). Respondents marked the most suitable situation for their organization. Second, respondents ought to mark the extensive usage of different management accounting methods (*track progress towards goals, review critical performance elements, monitor results, compare outcomes to expectations, tie the organization together, focus on critical issues, develop a common vocabulary in the organization, enable communication between the different segments of the organization, continuously challenge the results, action plans, make strategic decisions once the need for a decision is identified and an immediate response is required, response to strategic challenges, reach decisions in complex, anticipate the future directions, make the final decision, ensure the common understanding of the business*).

According to the research information, a matrix was prepared in which organizations were divided into four groups – static environment of organization, and it tries to absorb ongoing changes; static environment of organization, and it tries to simplify ongoing changes; dynamic environment of organization, and it tries to absorb ongoing changes; dynamic environment of organization, and it tries to simplify ongoing changes. Conclusions and interpretation (Boguslauskas & Kvedaraviciene, 2009; Ciegis, Ramanauskiene & Startiene, 2009; Girdzijauskas, Streimikiene & Dubnikovas, 2009; Gudonavicius, Bartoseviciene & Saparnis, 2009; Snieska & Bruneckiene, 2009) were made analyzing PMS extensive and usage results in four different groups.

Results and interpretation. Postal questioner was undertaken to collect data in this survey. The research population is confined to Lithuanian organizations. The survey covers a total sample of over 30 organizations.

Resuming research results, it could be stated that ongoing changes in client needs, product/service characteristics, in new products market development and in competition are the most frequent and show dynamic environment of the organization. Research results show that 37 percent of all organizations have dynamic environment and 63 percent – static environment of the organization.

According to the research results, it could be stated that changes or not in organization strategy, targets and tasks show organization's reaction to environment. The research results show that 67 percent of all organizations try to absorb ongoing changes in organizations environment - create new strategy, create and seeks new targets. Those four types of organizations will be used for future analysis.

Analyzing the research results in the case of general information about organizations – the number of employees - it could be stated that 46 percent of all organizations are small and have up to 50 employees, 27 percent are medium size and have 50-300 employees and 27 percent of all organizations are large and have more than 300 employees.

Analyzing the research results in performance measurement methods case – frequency and extensiveness - a strong correlation (0.708**) between them was found. According to the research results in performance measurement methods and size of organization cases (see figure 1and figure 2) it could be stated that:

- Small organizations use PMS methods very rarely (average is the smallest 3.9) but given information use to a wide range of decisions because external environment is mostly static and it tries to absorb ongoing changes. On the other hand, static external environment of organizations form low informational demand (everything is clear) and organizations don't need new or more PMS methods for decision making processes. Also it is too expensive to adapt new methods for small organizations.
- Medium size organizations use PMS methods more often than small organizations (average is 5.3) and given information use to a very wide range of decisions (average is the highest 5.6) because external environment is mostly static and it also tries to absorb ongoing changes.
- Large organizations frequent use of performance measurement methods directly influences a wide use of information which performance measurement methods provide because external environment is mostly dynamic and it tries to absorb ongoing changes. On the other hand, it could be stated that such kind of organizations usefully adapt all information which PMS methods provide for decision making process.

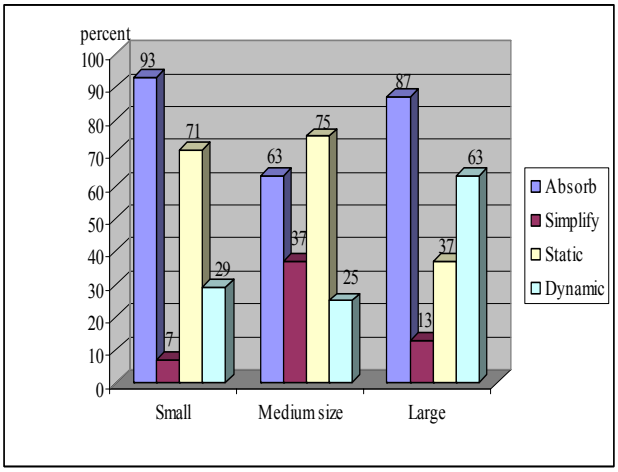

Figure 1. Reaction and environment according to the size of organization
(source: research results)

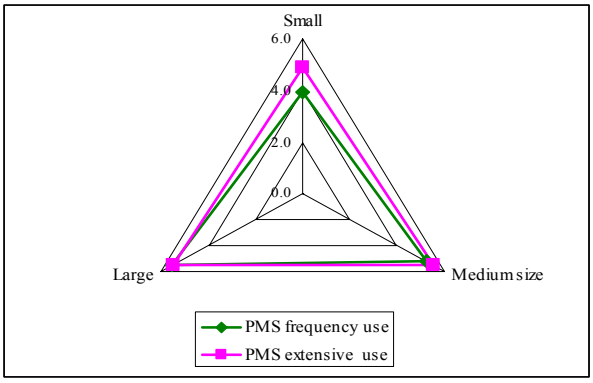

Figure 2. Frequency and extensive of performance measurement methods according to the size of organization
(source: research results)
**indicates significant at .00 level

Analyzing research results in complexity case – reaction and targets – a strong correlation (0.813*) between them was found too. Research results in reaction and targets complexity case (see figure 3) show that both ways are suitable to analyse organizations complexity of behaviour.

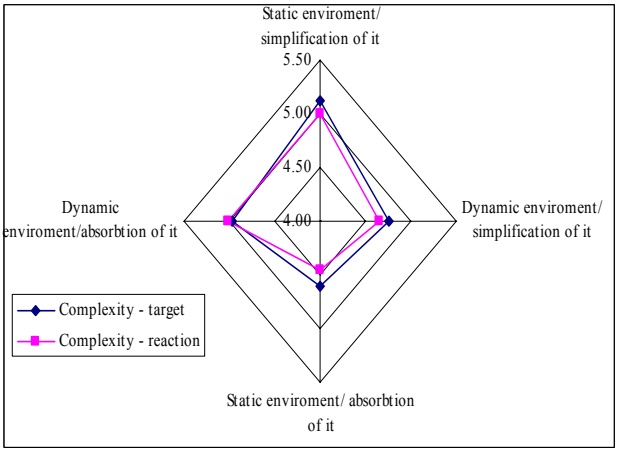

Figure 3. Reaction and targets complexity
(source: research results)
*indicates significant at .00 level

According to this, it could be stated that usage of PMS depends upon external environment and organization's reaction to it as those factors determine the demand and opportunities of usage. The larger attempt to absorb external environment challenges, the higher is the demand for information generated by performance measurement tools. Financially large organizations are strong to adapt new or more PMS methods. On the other hand, the higher level of dynamism of external environment limits opportunities for adequate usage of it.

Conclusions

According to theoretical prepositions it could be stated that changes of PMS reflects internal and external environment of organization and organization's reaction to it.

The external environment of organization is changing all the time and influences organization's behaviour. Environmental uncertainty and organizations reaction to it are important dimensions which affect the choice of PMS. The greater is the environment uncertainty, the greater demand for information, the more difficult it is to prepare measures which could then become the basis of performance evaluation.

According to the research results, it could be stated that usage and extensiveness of performance measurement system methods depend on the size of organization as it determine opportunities of usage and the demand for information.

Small and medium size organizations frequency of the usage of performance measurement system tools is at the low level but extensiveness of the usage of performance measurement system tools is at the high level because its external environment forms low informational demand (everything is clear) and organizations don't need new or more PMS methods for decision making processes.

Large organizations frequency and extensiveness of the usage of performance measurement system tools is at the high level, because their dynamic environment defines high informational demand and tries to get new or more PMS methods for decision making processes and they are strong financially to do this.

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Veiklos vertinimo sistemos tyrimas: organizacijos aplinkos perspektyva

Santrauka

Vykstantys globaliniai pokyčiai keičia organizacijos vertę kuriančių veiksnių pobūdį, o tai savo ruožtu lemia jų vertinimo ir valdymo problemą. Tokiu būdu veiklos vertinimo sistema tampa vis svarbesnė veikiant šiuolaikinėje verslo aplinkoje. Labai svarbu nagrinėti veiklos vertinimą iš pokyčių pozicijos, kadangi organizacija turi nuolat tobulėti ir reaguoti į naujas technologijas. Greita reakcija ir lankstumas versle gali būti pasiekiami tik tada, kai sprendimai bus pagrįsti laiku pateikta ir adekvačia informacija bei žiniomis, kuriuos sprendimams priimti suteiks organizacijos veiklos vertinimo sistema. Todėl šio straipsnio tyrimo **objektas** yra veiklos vertinimo sistema (toliau - VVS). **Mokslinė problema** yra formuluojama kaip klausimas: kaip veiklos vertinimo sistema skirtingo dydžio organizacijose atspindi organizacijos aplinką?

Straipsnio **tikslas** yra atskleisti vidinės ir išorinės organizacijos aplinkos dimensijas, kuriomis remiantis galima ištirti organizacijos veiklos vertinimo sistemą.

Tyrimo **metodologija** yra pagrįsta dviem teorinėmis prieigomis. Atsitiktinumų teorija yra populiariausia teorija, analizuojanti veiklos vertinimo sistemą. Tačiau ji neatsako į visus klausimus, susijusius su veiklos vertinimo sistemos pokyčiais ir jų valdymu. Todėl veiklos vertinimo procesas turi būti analizuojamas remiantis skirtingomis teorijomis. Kita teorija yra kompleksiškumo teorija. Veiklos vertinimo sistemos analizė šių teorijų aspektu leido išskirti du tiriamus susijusius kintamuosius: organizacijos išorinės aplinkos būseną – ar organizacijos aplinka dinamiška, ar statinė – ir organizacijos reakciją į ją supančią aplinką – ar organizacija absorbuoja, ar paprastina aplinkoje vykstančius pokyčius.

Pirmojoje straipsnio dalyje yra suformuluotos pagrindinės teorinės tyrimo prielaidos. Antrojoje dalyje pateikiamas atliktas kiekybinis tyrimas Lietuvos organizacijose ir jo rezultatai.

Teorinės prieigos ir suformuluotos hipotezės.

Atsitiktinumų teorija yra viena iš teorijų, kuri padeda analizuoti, kaip organizacijos VVS atitinka jos aplinką. VVS tyrimai, remiantis atsitiktinumų teorija, yra aiškinami taip: kiekvienai organizacijoje veikiančiai sistemai daro įtaką tokie atsitiktiniai veiksniai: bendra valdymo struktūra, valdymo informacijos sistema, verslo modelis, organizacijos kultūra ir vadovavimo stilius. Apibendrinant galima teigti, kad remiantis atsitiktinumų teorija organizacijos efektyvumas priklauso nuo skirtingų sistemų elementų – veiklos vertinimo sistema yra viena iš tų sistemų. Atsitiktinumų teorija yra grindžiama tuo, kad nėra vienos universalios ir visoms organizacijoms visiems atvejams tinkamos apskaitos sistemos. Veiklos vertinimo sistemos efektyvumas ir efektingumas priklauso nuo to, kiek tiksliai ji atitinka strategiją, jos korekcijas ir kiek tiksliai ji dera su organizacijoje vykstančiais procesais ir funkcijomis, taip pat kiek tikslią ir reikiamą informaciją teikia skirtingiems valdymo lygiams. Taigi išplaukia išvada, kad organizacijos aplinka yra svarbiausias veiksnys, kuris daro įtaką veiklos vertinimo sistemos pasirinkimui, kadangi ji turi įtakos organizacijos strategijai. Kita vertus, organizacijos aplinka gali būti apibūdinta remiantis neapibrėžtumu. Kuo didesnis aplinkos neapibrėžtumas, t. y. kuo aplinka sunkiau nuspėjama, tuo sunkiau perorientuoti veikiančias sistemas, siekiant tikslaus ir adekvataus kintančiai situacijai veiklos vertinimo. Aplinkos neapibrėžtumai negali būti paaiškinti remiantis vien tik atsitiktinumų teorija, kadangi aplinkos neapibrėžtumai daro ne tiesioginę įtaką veiklos vertinimo sistemai, o per organizacijos vidinę aplinką. Todėl veiklos vertinimo procesas turi būti analizuojamas remiantis skirtingomis teorijomis. Kita teorija yra kompleksiškumo teorija.

Kompleksinėje teorijoje teigiama, kad egzistuoja tariamos pusiausvyros būsena, esanti visiškai netoli to taško, nuo kurio sistemą ištiktų visiškas chaosas ir kuriame sistema maksimaliai išnaudotų savo sudėtingumą ir gebėjimą prisitaikyti. Šis taškas yra vadinamas chaoso riba ir gali būti paaiškintas taip: organizacijos, kurios yra pernelyg stabilios, kad galėtų reaguoti į besikeičiančias aplinkos sąlygas, nesugeba pakankamai konkuruoti ir galiausiai subankrutuoja. Organizacijos, kurios pernelyg keičiasi, taip pat subyra. Ir vis dėlto tarp šių dviejų egzistuoja optimali ir išlikti padedanti pozicija – chaoso riba, ties kuria organizacija yra kūrybiškiausia, skatina mokytis ir adaptuotis ir nukeliauja į ateitį anksčiau negu sugeba jūsų konkurentai. Remiantis kompleksiškumo teorija, visa organizacija – joje dirbantys darbuotojai, veikiančios sistemos – yra susiję tarpusavyje ir vienaip ar kitaip priklauso nuo aplinkoje vykstančių pokyčių, t. y. nuolat turi prisiderinti prie besikeičiančios aplinkos. Būtent kompleksiškumo teorija ir padeda atsakyti į klausimą kaip organizacija gali prisitaikyti, t. y. organizacija gali valdyti pokyčius, sekti aplinkoje vykstančius procesus ir tokiu būdu keisti, tobulinti organizacijoje jau veikiančias sistemas, modifikuoti savo elgseną naujoms sistemoms diegti ir suprasti, t. y. organizacija gali reaguoti į išorinę aplinką paprastindama arba absorbuodama išorinės aplinkos pokyčius.

Remiantis kompleksiškumo ir atsitiktinumų (atsitiktinumų) teorijomis, galima teigti, kad išorinės aplinkos neapibrėžtumas ir organizacijos reakcija į ją galėtų būti dimensijos, pagal kurias galėtų būti tiriama organizacijos veiklos vertinimo sistema. Šios dvi dimensijos formuoja organizacijos vidinės aplinkos, kuri iš dalies priklauso nuo organizacijos dydžio, skirtingus tipus:

- Mažose organizacijose veiklos vertinimo sistemos priemonės naudojamos labai retai, tačiau jų teikiama informacija pritaikoma daugeliui priimamų sprendimų, t. y. naudojama plačiai, kadangi jos daugiausia veikia statinėje išorinėje aplinkoje ir yra linkusios absorbuoti jos kompleksiškumą, kuris ir formuoja tokią vidinę organizacijos aplinką ir VVS.
- Vidutinio dydžio organizacijose veiklos vertinimo sistemos priemonės naudojamos retai, tačiau jų teikiama informacija pritaikoma daugeliui priimamų sprendimų, t. y. naudojama labai plačiai, kadangi jos daugiausia veikia statinėje išorinėje aplinkoje ir yra linkusios absorbuoti jos kompleksiškumą, kuris ir formuoja tokią vidinę organizacijos aplinką ir VVS.
- Didelėse organizacijose veiklos vertinimo sistemos priemonės naudojamos dažnai ir jų teikiama informacija pritaikoma daugeliui priimamų sprendimų, t. y. naudojama plačiai, kadangi jos daugiausia veikia dinaminėje išorinėje aplinkoje ir yra linkusios absorbuoti jos kompleksiškumą, kuris formuoja tokią vidinę organizacijos aplinką ir VVS.

Tyrimo rezultatai ir išvados.

Siekiant ištirti vidinės ir išorinės organizacijos aplinkos įtaką veiklos vertinimo sistemai, buvo atliktas kiekybinis tyrimas. Apklausa buvo atlikta Lietuvos organizacijose, kurios buvo atrinktos vykdant parankią atranką. Apklausos duomenys surinkti išsiuntinėjus klausimyną. Tyrimo apimtis yra 30 organizacijų.

Remiantis teorinėmis prielaidomis, galima teigti, kad veiklos vertinimo sistemos pokyčiai atspindi vidinę ir išorinę organizacijos aplinką ir organizacijos reakciją į ją.

Išorinė organizacijos aplinka nuolat kinta ir daro įtaką organizacijos elgesiui. Aplinkos neapibrėžtumai ir organizacijos reakcija į juos yra svarbios dimensijos, kurios daro įtaką veiklos vertinimo sistemos pasirinkimui. Kuo didesnis aplinkos neapibrėžtumas, tuo didesnis informacijos poreikis, tuo sunkiau parinkti tinkamas veiklos vertinimo priemones, kurios galėtų tinkamai vertinti veiklą.

Remiantis atlikto tyrimo rezultatais, galima teigti, kad veiklos vertinimo sistemos metodų pritaikymo dažnumas ir platumas priklauso nuo organizacijos dydžio, kadangi jis parodo panaudojimo galimybes ir informacijos poreikį.

Mažų ir vidutinio dydžio organizacijų veiklos vertinimo sistemos priemonės naudojamos retai, tačiau priemonių teikiama informacija yra naudojama plačiai sprendimams priimti, kadangi mažų ir vidutinio dydžio organizacijų išorinė aplinka formuoja mažą informacijos poreikį (viskas yra aišku) ir organizacijoms nereikia naujų ar daugiau veiklos vertinimo metodų sprendimams priimti.

Didelės organizacijos veiklos vertinimo sistemos priemones naudoja dažnai ir jų teikiama informacija pritaikoma daugeliui priimamų sprendimų, t. y. naudojama plačiai, kadangi jų dinaminė aplinka formuoja aukštą informacijos poreikį ir jos stengiasi diegti naujas veiklos vertinimo sistemos priemones, kurios būtų naudingos sprendimams priimti, taip pat didelės organizacijos yra pajėgios finansiškai tai padaryti.

Raktažodžiai: *veiklos vertinimo sistema, kompleksiškumo teorija, atsitiktinumų teorija.*

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