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PERFORMANCE MEASUREMENT SYSTEM CHANGES ACCORDING TO ORGANIZATION'S EXTERNAL AND INTERNAL ENVIRONMENT

Lina Kloviene[1], Edita Gimzauskiene[2]
Kaunas University of Technology, Lithuania
[1]lina.kloviene@stud.ktu.lt, [2]edita.gimzauskiene@ktu.lt,

Abstract

This article presents results of pilot 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 turn, are realized in close connection with projects on re-organizing internal management systems. The main feature modern performance measurement system is application theoretical descriptive method into practices, incorporation of it to decision making process, and improvement of the system according to changing external conditions and internal potential of organization. Those processes means organizational changes based on relations with the environment. The dimensions that lead to deeper analysis of relations between performance measurement system and its external and internal environment of organization were disclosed in this article. In order to disclose those relations changes of organizational system could be analyzed in the context of different theoretical assumptions – contingency and complexity theories.

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

Introduction

The use of non-financial metrics in performance measurement (PM) has emerged as an important area of research over the past two decades. For different companies, performance measurement systems (PMS) play a particularly important role in operations and in business strategy implementation. A PMS provides the requisite information for the monitor, control, evaluation, and feedback functions for operations management. In addition, it can also become a driver for motivation, management action, continuous improvement, and the achievement of strategic objectives. Indeed, a successful PMS can provide a proactive guide for operations and strategic management (Gimzauskiene, Valanciene, 2005; Valanciene, Gimzauskiene, 2007). In order to meet informational demand of decision makers organization needs continual improvement of the system itself. Continuous improvement means organizational changes. Propositions listed above leads to the conclusions that performance measurement system (PMS) is useful for data accumulation and transformation into valuable knowledge if organizational changing process is ensured.

The most popular theoretical approach for PMS studies is contingency theory. 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. On the other hand the last decade complexity theory has been advocated as a way to help understand organizational change and innovation.Changes of performance measurement system 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 formulated as following:

How external and internal factors of organization are reflected in performance measurement system?

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

The first part of this article presents theoretical background and interpretations of performance measurement system form contingency and complexity theories point of view. In order to point out the external and internal environment of organization influence on performance measurement changes, pilot quantitative research was performed. The purpose of the research was to ground the main dimensions according to which changes of performance measurement system could be analyzed and to point out the character of different performance measurement systems elements according to them. Results of the research in Lithuanian organizations are presented in the second part of this article.

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Theoretical background and development of the hypothesis

Contingency theory and internal/external environment of organization

Contingency theory is one of the theories which help to analyze in what way PMS fits to organization's internal environment (Gimžauskienė and Klovienė, 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 such as strategy, objectives, structures, culture, technology, etc. In the literature on PMS many normative models are proposed (Hudson, Smart and Bourne, 2001). Following the criticism of traditional approaches, which were based on financial measures, in 1980s balanced and dynamic architectures were developed and analyzed. However, the literature reveals that little empirical research on the implementation and use of these architectures has been carried out. Furthermore, the factors that enable and constrain performance measurement have not been investigated (Garengo and Bititci, 2007).

In order to identify the contingency factors influencing PMS in organizations, an in-depth literature review of PMS literature was carried out (Garengo and Bititci, 2007). In order to find out the main contingency factors, the information collected through the literature review was aggregated using the categorical aggregation and interpretation technique, which brings instances together until something can be said about them as a group (Biazzo and Bernardi, 2003). Knowledge consists of building blocks and the aggregation technique can be used to arrange and assemble different sets of blocks for solving more complex problems, i.e. the categorization of properties through intuitive aggregation. Then, interpretation is applied to give a meaning to each group. From this, the following five contingency factors, that may influence the implementation and use of performance measurement, were identified by Garengo and Bititci (2007):

- corporate governance structure;
- MIS;
- strategy (referred to as the Business Model);
- organizational culture and management style;
- external environment.

Contingency factors influence on performance measurement system:

- In order to study corporate governance structure in organizations, two key dimensions have to be considered: the role of the board of directors and the influence of ownership on corporate governance. The nature of the corporate governance structure impacts the perceived value of a performance measurement system as a decision-making support tool. The role of the board of directors moves from a service role to a strategic one, when the composition of the board of directors moves from entrepreneurs who own and manage the company to a group of managers and external shareholders. The owners do not manage the company and they have no influence on company governance. In this case the importance of PMS as a tool for supporting decision-making increases. When the owners manage the companies, PMS is not used or is used in the wrong way.
- The introduction of powerful technological tools has often led companies to focus their attention on technology – called hard aspects – and to neglect managerial practices and human behavior – called soft aspects. Consequently, insufficient attention is given to the organizational impact of information systems (Garengo et al., 2005). The relationship between PMS and MIS is advanced information system practices create a context that favors the use of a performance measurement system. When managerial practices and human behavior with respect to the MIS are advanced, there is a context that favors performance measurement, regardless of the level of investment in information systems.
- The relationship between performance measurement and business models can be analyzed according to the model developed by Bititci and Martinez (2001) - the value matrix. Business models are highlighted as a key contingency factor. Companies start to use performance measurement to support changes in its business model (Beeson and Davis, 2000; Grobman, 2005).
- Organizational culture is defined as the deepest level of basic assumptions and beliefs that are shared by members of an organization and considered to be one of the most stable and inertial factors in an organization. Consequently, changes in culture are often described as complex and part of a long process. Management style is defined as the practices adopted by leaders in decision making, management of information, relationships, motivation and managing subordinates (Stacey, 1996; MacIntosh and MacLean, 2001). Management style influences the level of delegation, the approach and time required to make decisions and the control of activities.

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Moreover, management style is considered to be one of the key aspects to understanding organizational culture (Quinn, 1984; Gimžauskienė and Klovienė, 2008 (a)). PMS use promotes the introduction of an achievement culture and a consultative management style. During the implementation process an authoritative management style is required for the successful implementation of a PMS. However, this is only a way to support the implementation process. After that, using PMS in daily work, an achievement culture and consultative management style are used;

- The environmental impact on performance measurement can be investigated indirectly because environmental dynamics affect business strategy consequently it is enough to analyze the influence of strategy.

Summarizing it could be stated, that contingency theory postulates that the effectiveness of the organization is contingent upon the elements of various subsystems – 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 (Gimžauskienė and Klovienė, 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. 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 organization

The second theory which can explain changes of PMS in organization is complexity theory. In some ways, complexity theory is an extension of General Systems Theory, which became the dominant model of organizational theory in the 1960s. The dominant paradigm for decades was reductionist, suggesting that a system can be analyzed by understanding each of its parts and that there was a general linear relationship between inputs and outputs (Rooney and Hearn, 1999; Valančienė, Gimžauskienė, 2008).

The space of complexity is that state which the system occupies and which lies between order and chaos (Bechtold, 1997; Jenner, 1998; Tetenbaum, 1998). It is a state which embraces paradox; a state where both order and chaos exist simultaneously. It is also the state in which maximum creativity and possibility exist for organization to realize and explore (Letiche, 2000; Macbeth, 2002).

We tend to see organizations and us as members of those organizations, as separate from our environment. We seek to control that environment and experience frustration when it behaves in a way that is incongruent and in conflict with the operations of our organizations. The study of complexity reveals that we are in dynamic reaction with our environment and are very much part of the process that creates that environment. We do not exist in isolation but we exist and have our being within a web of relationships. If we accept that we are participants in this creative process of our environment, we must allow the flow of events rather than trying to swim against the current by trying to control the flow. The study of complexity further reveals that complexity is in fact the result of simplicity (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 and MacLean, 2005; Miguel and Joao, 2006).

This point is referred to in the literature as the edge of chaos. The edge of chaos is a useful construct to explain some of the apparent paradoxes of management. One of the paradoxes of management or organizations is that stability and flexibility are both seen as creating organizational effectiveness, even though these two constructs are opposites. Complexity theories reconcile this. Using this concept in the organizational context, organizations that are too stable fail to respond to changing conditions in the environment are at a competitive disadvantage, and eventually go belly-up. Organizations that are changing too much also disintegrate. Yet there is an optimal place between these two that promotes survival, the edge of chaos, where the organization is the most creative, promotes the most learning and adaptation and, as paraphrased by Ralph Stacey, gets to the future before your competitors do (Smith, 2005; Burnes, 2005).

Good managers and organization leaders know when to change communications rules to move the organization to the edge of chaos (either away from chaos or away from stability) in order to promote organizational changes. Complexity theory deals with the nature of emergence, innovation, learning and

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adaptation (Keene, 2000). According to complexity theorists such as Stacey (1996) the concept of the organization moving from one stable state to another as a result of change is flawed. Our best use of complexity theory for understanding organization development may be as a metaphor giving us new insights, rather than trying to search for common principles across a variety of very different systems (Manson, 2001).

Hypothesis of the research

Combining main presumptions of complexity and contingency theories it could be maintained that 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 form four different types of internal organization's environment peculiarities of which performance measurement system should reflect. **According to complexity and contingency dimensions it could be hypnotized that character of external environment and organization to it could be defines frequency of usage of performance measurement tools:**

- Static external environment and organizations attempt to simplify it forms internal environment that will be reflected in PMS. Frequency of usage of performance measurement system covering cost accounting, planning and analytical (control) tools is at the lowest level in this type of organization. Static environment defines low informational demand (everything is clear), attempt to simplify the situation defines more opportunities to get it (simplicity of goals and activities low demand for changes).
- Static external environment and organizations attempt to absorb it forms internal environment that will be reflected in PMS. Frequency of usage of performance measurement system covering cost accounting, planning and analytical (control) tools is at the highest level in this type of organization. Attempt to catch more external opportunities defines high informational demand (complexity of goals and activities high demand for changes) static environment ensures potential to get it (clear causal relations).
- Dynamic external environment and organizations attempt to simplify it forms internal environment that will be reflected in PMS. Frequency of usage of performance measurement system covering cost accounting, planning and analytical (control) tools is at the moderate level in this type of organization. Dynamic environment defines high informational demand (everything is unclear), attempt to simplify the situation defines more opportunities to get it (simplification of goals and activities in order to catch new external opportunities).
- Dynamic external environment and organizations attempt to absorb it forms internal environment that will be reflected in PMS. Frequency of usage of performance measurement system covering cost accounting, planning and analytical (control) tools is at the moderate level in this type of organization. Dynamic environment defines high informational demand (everything is unclear), attempt to absorb the situation defines less opportunities to get it (complexity of goals and activities to catch all external opportunities).

Research method and results

Research method

In order to point out the external and internal environment of organization influence on performance measurement changes, 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 organization and how performance measurement system fits to these changes.

Complexity was analyzed according to organization's reaction when performance results do not fit to its purposes. In complexity 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*).

External environment of organization was analyzed according to frequency of changes and in this case respondents need to mark frequency of listed changes (*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*).

In performance measurement methods case respondents 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.

Conclusions and interpretation were made analyzing results of organizational changes, organization's reaction to environment and used performance measurement systems.

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 18 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 organization. Research results show that 50 percent of all organizations have dynamic environment and 50 percent – static environment of organization. According to research result it could be stated that changes or not in organization strategy, targets and tasks show organization's reaction to environment. Research results show that 67 percent of all organizations try to absorb ongoing changes in organizations environment - creates new strategy, creates and seeks new targets. Those four types of organizations will be used for future analysis

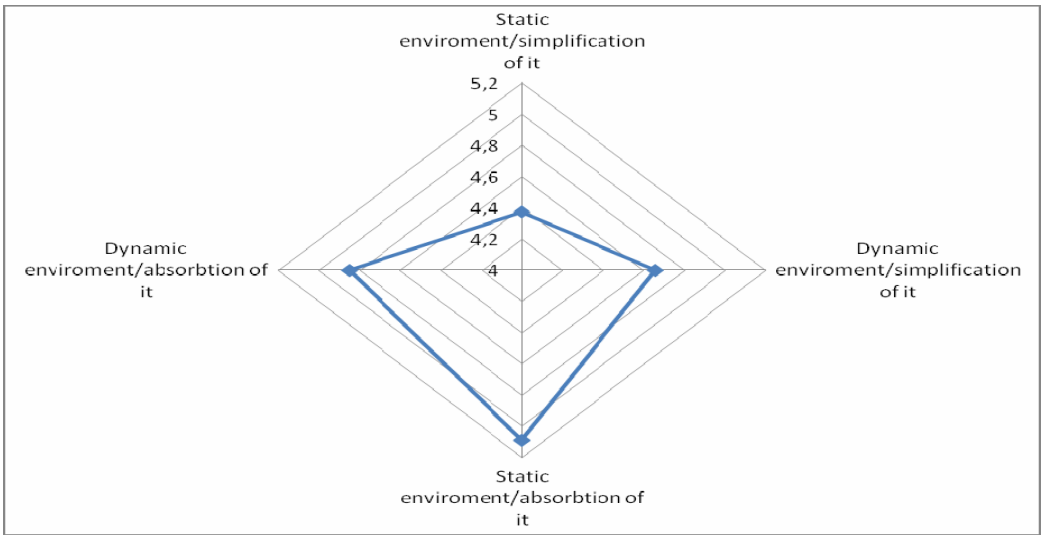

Figure 1. Organizations environment influence on usage of PMS

According to research results (see figure 1) it could be stated that:

- There are 11 percent of all organizations which external environment is static and organization try to simplify it, also it forms internal environment of organization which has the lowest demand to use of performance measurement methods and tools. At this case the smallest average was found (total average 4.4). Frequency of usage of different performance measurement methods (cost accounting, planning and analytical (control) tools) is least intensive. This could be explained that static environment defines low informational demand (everything is clear), attempt to simplify the situation defines more opportunities to get it (simplicity of goals and activities low demand for changes).
- There are 22 percent of all organizations which external environment is dynamic but organizations try to simplify it and it forms internal environment of organization which has moderate demand to use of performance measurement methods and tools. At this case total average was found 4.7. Frequency of usage of different performance measurement methods (cost accounting, planning and analytical (control) tools) is medium intensive. Dynamic environment defines high informational demand (everything is unclear), attempt to simplify the situation defines more opportunities to get it (simplification of goals and activities in order to catch new external opportunities).
- There are 28 percent of all organizations which external environment is dynamic and organization try to absorb it, also it forms internal environment of organization which has moderate demand to

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use of performance measurement methods and tools. At this case total average was found 4.9. Frequency of usage of different performance measurement methods (cost accounting, planning and analytical (control) tools) is medium intensive. Dynamic environment defines high informational demand (everything is unclear), attempt to absorb the situation defines less opportunities to get it (complexity of goals and activities to catch all external opportunities).

- There are 39 percent of all organizations which external environment is static and organization try to absorb it, also it forms internal environment of organization which has highest demand to use performance measurement methods and tools. At this case the highest average was found (total average 5.1). Frequency of usage of different performance measurement methods (cost accounting, planning and analytical (control) tools) is most intensive. This could be explained that organization has highest demand because it try to absorb ongoing changes and it has more opportunities to get it because of static environment (system doesn't need to change so fast).

According to this it could be stated that usage of performance measurement system 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 demand for information generated by performance measurement tools. On the other hand the higher level of dynamism of external environment limits opportunities for adequate usage of it.

According to research results (see table 1) it could be stated that:

- Traditional accounting method is used much more that Activity based costing (ABC). It could be explained that ABC takes a long time to implement and it's expensive for a small organizations. The highest averages in ABC case where found when organizations try to absorb ongoing changes.
- Planning tools (strategic, middle range) were used intensively in all cases. It could be explained that organizations know these tools for a long time and it's easy to use them.
- Balance Scorecard (BSC) is used much more frequent when external environment is static. It could be explained that BSC implementation takes a long time and it's expensive so when environment is dynamic (changing all the time) organization could not be so fast to implement it (easier to use analytical tools), that's the main reason, why BSC much more popular in static environment.

Table 1. External environment influence on usage of different performance measurement tools

	Traditional accounting	**Activity based costing**	**Pricing methods**	**Strategic planning**	**Middle range planning**	**Budgeting**	**Balanced scorecard**	**Analytical tools**
Static environment/ simplification of it	3	3	5	5	5	4,5	5	4,5
Dynamic environment/ simplification of it	6,25	2,75	4,75	5	5,75	4,75	2,5	5,5
Static environment/ absorption of it	6,29	3,71	6,43	4,86	5,57	6,14	3,43	4,29
Dynamic environment/ absorption of it	5,8	3,6	5	5,2	5,6	5,2	2,8	5,6

According to research results could be stated that hypothesis idea was proved but there are few research limitations - small research spread, for deeper statistical analysis could be used clusterical methods and it could be measured more aspects of tools (not only frequency, but complexity, content too).

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Conclusions

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

The external environment of organization is changing all the time. Such changing external pressures from stakeholders in the social and economic environment influence organization's behaviour.

There are no universally appropriate accounting and measurement systems which could be applied equally to all organization in all circumstances.

Environmental uncertainty and organizations reaction to it are important dimensions which affects the choice of PMS. The greater 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 research results it could be stated that usage of performance measurement system 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 demand for information generated by performance measurement tools.

The other hand the higher level of dynamism of external environment limits opportunities for adequate usage of it.

Limitations and implication for future research

In future research all limitations will be eliminated – research spread is going to cover about 90 organizations and for deeper statistical analysis will be used clusterical methods. Also will be measured more aspects of performance measurement tools - complexity, content.

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