Development of Performance Measurement System
According to Business Environment:
An SME Perspective

Abstract
Organizations often introduce performance measurement system (PMS) in order to evaluate the level of their performance, make comparison with competitors and plan their future activities. An importance of performance measurement and its information has increased when business environment of today has become more dynamic and competitive. Organizations are confronting unprecedented radical changes to which they must adapt to in order to survive and prosper. Processes of adaptation and reaction to business environment could be ensured by a fast decision making process, an apropos information and a suitable data flow. Since consistent, logical and strategic decisions could affect the conformance to uncertain and complex environment, the design, features and implementation of a performance measurement system should always conform to business environment. According to position of small and medium-sized enterprises (SMEs), implementation of new theoretical performance measurement methods passes over with rational usage of internal resources. This influence the need to search for new possibilities to development of performance measurement system. However there is a lack of literature concerning development of performance measurement system inside SME. The aim of this paper is to investigate an internal resources based development of performance measurement system according to business environment. Research results are based on the quantitative approach (questionnaire survey) of Lithuanian SMEs. The results can guide SMEs in the selection of a performance measurement system which conforms to business (external and internal) environment considering particular factors such as the state of business environment, structure of performance measurement system or rational usage of internal resources.

Key Words
business environment, performance measurement, small and medium-sized enterprises

JEL Classification: M20, M40

Introduction
Present business environment conditions of rapid change require agility, flexibility and innovation. Together with strategic objectives, processes and measures, these dimensions belong to the set of indicators that organizations use to measure the success of their performance. It is noticeable that importance of performance measurement was growing in changing and complex business environment and internal potential of organization [24, 17]. Organizations implement performance measurement systems
(PMS) in order to manage and assess their processes. The strategic goals are translated into indicators. In this way managers verify if targets are met, allocate resources and choose what strategy to implement [26]. Since consistent, logical and strategic decisions could affect the conformance to uncertain and complex environment, the design, features and implementation of a performance measurement system should always conform to business environment. The selection of the most appropriate PMS or set of indicators is very critical. In the design of the most representative PMS managers often consider properties such as conformity with the monitored goals, exhaustiveness, cost of data acquisition, simplicity of use, etc. [1, 16, 18, 23]. However, this analysis may not provide enough information in choosing the structure and features of PMS according to business environment.

Small and medium-sized enterprises (SMEs) are important to maintain strong economic growth. However, how to sustain their performance in the long term is a big challenge [3]. For SME, the adoption of advanced managerial practices in the main business processes is a key to the successful improvement of their business performance and competitiveness. According to position of SME, implementation of new theoretical performance measurement methods passes over with rational usage of internal resources. Therefore, there is a clear need to stimulate the development of performance measurement system in SMEs considering the factors characterizing these companies [5]. This influence the need to search for new possibilities of development of performance measurement system for SMEs. There are a number of well recognized characteristics that differentiate SMEs from larger organizations [7] and these factors inevitably impact performance measurement process. However there is a lack of literature concerning development of performance measurement system inside SME. Moreover, all of the authors mainly focused on limited aspects of performance measurement - operations, manufacturing, service, technology, strategic - while none of the papers offers a broader and more comprehensive view of all the performance measurement practice in SMEs.

The aim of this paper is to investigate an internal recourses based development of performance measurement system according to business environment. The paper includes tree main parts. The development of a theoretical framework from institutional, contingency and complexity theories point of view is presented in the first part. In order to point out the different dimensions of business environment influence on the content and features of performance measurement system, quantitative research was performed. Research methodology is presented in the second part of the paper. Research (survey) results in Lithuanian SMEs are presented in the third part of this paper.

1. Theoretical background

1.1 Identification of business environment

According to open systems theory organization interacts with, adapts to and seeks to control its environment in order to survive [4]. Institutional theory as theoretical
approach of management studies is analyzed and shows that institutional theory identifies internal and external environmental factors as institutional factors, according to which the behavior of an organization could be disclosed and researched [4, 13, 14]. This shows that according to institutional factors internal and external environment of organization could be recognized. The analysis of different institutional factors groups showed that institutional factors perform in different ways. Two groups of institutional factors - economic and coercive - perform irrespective of an organization and other two groups - normative and mimetic - depend on the reaction of organization. According to this aspect it could be stated that institutional factors could perform in two levels: (1) organizational level, (2) environmental level and help to recognize internal and external environment of organization.

As contingency theory postulates, that different organizations perform in different ways in the same environmental circumstances and provides a methodology for recognition of an external environment of organization [28]. According to this aspect, uncertainty level of external environment is used for a state identification of external environment. External environment of organization which is understood as an entirety factors of social and political-law influencing decisions, performance processes in organizations. Mentioned factors are aggregated into a list according to institutional factors and consider variables \( x_i \). These variables could be described according changes and uncertainty. According to this aspect, external environment of organization is measured by the level of uncertainty, which is the result of changes in variables \( x_i \).

According to limitations of contingency theory, an integration of two theories was proposed choosing complexity theory, which helped to disclose reaction of organization to environment and its influence on performance measurement system. Such a reaction is used to recognize the state of an internal environment of organization [2, 8]. Internal environment of organization is understood as an entirety factors associated with organization. Mentioned factors are aggregated into a list according to institutional factors and consider variables \( x_{in} \). According to complexity theory it could be stated that factors of internal environment are developed as a reaction to the level of uncertainty and could be described according to level of complexity of variables \( x_{in} \).

According to analyses above, an intensity of institutional factors was disclosed using an uncertainty and a complexity levels and is substantiated different intensity of institutional factors influence on performance measurement system which could be disclosed according to its structure. Presuming that organizations react to their external environment \( ENVIR_{ex} \) by the level of uncertainty of variables \( x_{in} \) and such a reaction is found in an internal environment of organization \( ENVIR_{in} \) by the level of complexity of variables \( x_{in} \), it could be stated the dependency:

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ENVIR_{ex} = f(x_{in}) \Rightarrow ENVIR_{in} = f(x_{in}).
\]  

(1)

Analyses made and dependency determined let to state, that external environment of organization assumes static or dynamic state [28] to which reaction of organization assumes simplicity or absorption [2, 8]. Based on these thoughts, we predict that there is
an interaction effect between an external environmental uncertainty and an internal environment reaction:

H1. An external environmental uncertainty and an internal environment reaction will have a positive interaction.

1.2 Characteristics of performance measurement system in SMEs

A performance measurement system (PMS) is vital in the management of an organization. It does not only tell whether an organization is successful, but, if used properly, can also help an organization implement their strategies. At the same time, if the design and implementation of the PMS are not done with care, the PMS could lead to dysfunctional behavior and in the end could harm the entire organization [19]. Parker [21] and Kuwaiti [12] analyzed performance measurement as a main management tool for decision making, control and ensuring useful information for effective resource allocation. Olsen et al. [20], Marchand and Raymond [15] researched performance measurement as a system for information integration, useful for implementation of objectives in organization and combined inside. Kumar et al. [11] stated that performance measurement helps to form strategy of organization, manage and change performance, resources allocation, motivation of employees and ensure permanent success. Gunawan, Ellis-Chadwick and King [9] analyzed performance measurement as a tool for a performance improvement and strategic planning. Tucker and Pitt [27] researched that performance measurement helps to evaluate and change performance goals and increase value creation. Hence, it can be argued that the performance measurement system is a set of instrumentations of performance measurement (measures), ensuring information about an internal environment of organization, which could be used for a measurement of strategy, goals and processes and become a knowledge, which could be used for a decision making (strategic, tactic, operative level) process and convert to wisdom, ensuring feedback and adaptation to external environment.

Despite the availability of various models and methodologies supporting the implementation of performance measurement practices [25], their adoption in SMEs is still low, and it is necessary to identify approaches that meet the specific needs of these companies [6, 10]. The above performance measurement system definitions and their constituent activities do not consider company size. However, performance measurement within the context of SMEs requires a deeper understanding of SME characteristics [3]: short-term priorities, internal operational focus and lack of external orientation, looking for flexibility, poor managerial skills, command and control culture, entrepreneurial orientation, limited resources.

We state that level of external environmental uncertainty and level of internal environment reaction to it could be dimensions according to which content of PMS (strategy, goals, processes, measures and decision making) could be researched in SMEs. We predict the influence of the business environment on performance measurement system in the following hypotheses:
H2. Increasing level of dynamism defines rising demand for variety of information and could influence higher number of used measures and processes for strategy implementation.

H3. Increasing level of absorption defines rising demand to catch all external opportunities and could influence high level of strategy complication, variability of underlying goals and measures information usage for a wide range of decision making.

2. Methodology

In order to point out content of performance measurement system according to the dimensions of business environment, a quantitative research (questionnaire survey) was performed. The questionnaire consists of three parts: part one is related to the background information of the company, part two is related to the characteristics of a business environment and part three is related to the PMS information. The time required to fill in the questionnaire was approximately 20 minutes.

External environment of organization was analyzed according to the frequency of changes of external environment, 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 customer needs, in product/service, in pricing policy, in technology, in competition, in legislation).

Reaction to environment was analyzed according to complexity – an organization tries to absorb or simplify external environment. Complexity was analyzed in four ways using Likert scale – strategy complexity, goal complexity, structural complexity and interaction complexity. Strategic complexity was measured using two (cost leadership and differentiation) strategies by asking to indicate the importance of 12 items. Goal complexity was assessed by asking to indicate the importance of 10 goals. Structural complexity was measured according to the level of formalization which was measured using 6 items that addressed the degree to which rules were observed in the organization. Interaction complexity was assessed by asking to indicate a number of different groups highly involved in resolving 7 strategic issues.

Performance measurement system was analyzed according to measures, strategy, underlying goals, processes for strategy implementation and range of decision making in an organization. Measures were assessed by asking to indicate the usage of 28 measures from 6 main measures groups (financial, market, customer, internal process, employees, innovation and growth). The strategy, using Likert scale, was measured according to two (cost leadership and differentiation) strategies by asking to indicate the importance of 6 items. In goals case, respondents ought to mark reachable goals from 2 goal groups: long-term and short-term. The processes, using Likert scale, were measured according to value chain by asking to indicate the importance of 6 activities. A range of decision making was measured using 3 (operational, tactical, strategic) decision making levels by asking to indicate the usage of 28 measures for different decision making levels.
After the data was collected, Spearman correlation coefficient was used to confirm the validity of proposed hypothesis by using SPSS (Statistical Package for Social Sciences) and Statistica software.

3. Research results

Questionnaire was undertaken to collect data in this survey. A total 589 online questionnaires were distributed to randomly selected SMEs managers in various industries in Lithuania in April to July 2010 via personal emails. Of the questionnaires 170 were finally returned. Out of the 170 questionnaires, 62 were eliminated from the analysis as same data was missing. This left 108 questionnaires for further analysis giving a response rate of 18.3 per cent.

Resuming research results, it could be stated that frequency of changes in customer needs, product/service, pricing policy, technology, competition and legislation show dynamic and static environment of the organization. Research results show that 41 percent of all SMEs have static and 59 percent – dynamic business environment. According to the research results, it could be stated that complexity shows organization’s reaction - simplicity and absorption – to external environment. The research results show that 66 percent of all SMEs try to absorb ongoing changes in external business environment. The study has analyzed configurations of two dimensions of external environment and two dimensions of internal environment, a total of four constructs. Hence the total cluster analysis was based on four constructs. Based on the hierarchical procedure undertaken, the number of clusters was set at two for each external and internal environment separately. Cluster analysis lets to prove that classification according to external and internal environment is purposive.

![Fig. 1 Results of Spearman correlation coefficient analysis](image)

Note: * $p < 0.05$; ** $p < 0.01$  

Source: own
The proposed hypothesis is verified by quantitative study using Spearman correlation coefficient as presented in Figure 1. According to research results could be stated that a positive interaction between an external environmental uncertainty and an internal environment reaction was identified. The first hypothesis could be confirmed.

According to research results could be stated that increasing level of dynamism could influence higher number of measures and flexible processes for strategy implementation in SMEs. Organizations operating in static external environment used less measures than operating in dynamic external environment, because increasing level of dynamism defines rising demand for variety of information and in order to get it organizations use more measures in different performance processes.

Analyzing research results in an internal environment point of view could be stated that increasing level of absorption could influence strategy complication, variability of underlying goals and measures information usage for a wider range of decision making in SMEs. This could be explained, that organizations trying to catch all external opportunities could not be in time to correct strategy and underlying goals according to new conditions, their reaction could be found in a wider decision making level.

Analyzing research results correlations were also found between internal environment and (1) measures 0.349, which was statistically significant (p<0.01) and (2) processes 0.210, which was statistically significant (p<0.05). Such interactions could be explained that information of measures for SMEs is useful for identification of an internal potential rather than to meet the requirements of information demand about external environment. The empirical data confirmed that internal operational focus and lack of external orientation still affects many SMEs and as result affecting performance measurement process.

Also a correlation was found between the size of an organization (small-sized, medium-sized and large) and decision making level 0.420, which was statistically significant (p<0.01). According to this result could be stated that measurement information could mostly be informally used for a narrow decision making in SMEs. The empirical data confirmed that SMEs have flexible processes that are not very structured.

**Conclusion**

The globalization of market and production processes is triggering continuous changes within organizations in order to be competitive. In today’s dynamic business environment especially small and medium size enterprises (SMEs), are challenged to adapt to rapid market changes. Such a change within the business perspective emphasizes that organizations need fast, accurate and flexible information about external possibilities and internal potential. This informational demand could be ensured by PMS. PMS is usually introduced by organizations in order to monitor the achievement of goals, to allocate resources and to implement a selected strategy. This process could be successfully ensured if PMS would reflect business environment in which organization is operating. The identification of conformity between performance
measurement and business environment is one of the most critical issues. For SMEs, the adoption of PMS according to business environment is a key to the successful improvement of their business performance and competitiveness. However, it could be mentioned two special aspects that SMEs (1) experience difficulties in adopting new and innovative performance measurement methods, (2) is not a scaled-down version of a large organization and PMS what was suitable for a large organization could not be suited for a SME. This paper investigated an internal resources based development of PMS according to business environment, a methodology to evaluate business environment and structure of PMS.

Based on empirical research analyses influence of business environment on the structure of PMS, possibilities to adapt it information and usage for a decision making process could be verified.

Based on the aspects of SME recommendations could be stated that reaching to develop PMS according to business environment, the external environment should be scanned regularly to identify and monitor factors that may have an impact on SME businesses. Dynamic external environment raises demand for variety of an information influencing importance of different measures (financial, market, customer, internal process, employees, innovation and growth). According to research results, financial and market measures should mostly be taken into account operating in a static external environment. External orientation should be implemented through effective internal/external communication. This integrated approach will also help to motivate and enable the organization’s members to develop a common understanding and to work towards common goals. As the literature points out [22], the success of SMEs in today’s turbulent markets depends largely on their ability to engage in environmental scanning activities in order to understand the behavior of external stakeholders and trends.

References


