KEY PERFORMANCE INDICATORS IN SMALL AND MEDIUM SIZED ENTERPRISES

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Abstract: *The important role played by Small and Medium Sized Enterprises (SME) in the economic development of central and eastern European countries has attracted the recent attention of policymakers but remains relatively unexplored. Research has suggested that enterprise growth is determined not only by the traditional characteristics of size and age, but also by other enterprise – specific factors such as indebtedness, future growth opportunities, process and product innovation, and organizational changes. The success of any enterprise can be measured in different ways.*

Key Performance Indicators, also known as KPI, are quantifiable measurement that helps decision makers define and measure progress toward organizational goals. KPI vary from one industry to the next. To measure the performance of the enterprise is, therefore, necessary to know which and also how subsystems of its internal structure contribute to the overall performance.

Introduction

Performance indicators are the heart of the performance measurement system and represent indispensable means for making performance based management decisions.

The performance measurement system is a fundamental building block of total quality management. Typical categories of performance measurement include process measures (inputs, outputs) and outcome measures (immediate, intermediate, long term) [1, 2].

Total quality management is an integrated approach, consisting of principles and practices, whose goal is to improve the quality of products and services in SME through continuously meeting and exceeding customer's needs in most competitive ways.

Key Performance Indicators are quantifiable measures, agreed to beforehand, that reflect the critical success factors of an SME. They are the methods used to periodically assess the performances of any SME, business units and their divisions, departments and employees.

In the past, KPI have focused mainly on financial measures such as sales growth, profit, cash flow and return on investment in order to analyse performance [3], but this measures are not linked with strategies and therefore, can conflict with objectives. Several researchers [4, 5, 6] have also established the relationship between staff motivation, job satisfaction and organizational commitment as a measure of employees' performance.

Others authors, Chlpeková and Koltnerová [7], are more specifically dedicated to workforce performance management and state that team leaders or supervisors are the managers who directly influence quantifiable indicators of working results. Their functions and competencies are mainly focused to achieve the desired production volume in the required quality.

When monitoring enterprise performance it is necessary to use a combination of financial and non-financial indicators. So, key performance indicators for an SME may be financials and non-financials [8].

Measuring of financial indicators is relatively easy due to the fact that their counting is clearly determined and these financial indicators can be easily calculated from data in the financial statements. It is harder to keep track of non-financials indicators, even though there are certain norms, which can be used as basis for their formulation.

Key Performance Indicators

Recently, non - financial indicators have been receiving growing attention among SME to provide additional information for managers.

In the past Tambunan [9] listed a few factors of competitiveness advantages, such as technology, human resources advantages, efficiency and effectiveness, product quality, promotion, economic sale, business network, capital, and infrastructure.

Pawitan et al. [10], defined some indicators such as ventures performance, ventures competitiveness, capital and financial, raw material, production and operation, marketing and distribution.

Today more than ever, it appears that the traditional management of performance, based primarily on financial management has hit its limits and lately in the world, there is a trend to promote new non-traditional indicators, methods, based on non-financial, strategic and often and qualitative indicators, methods and models [11]. This is due to the claim that this traditional approach which mainly focuses on financial-based measures fails to respond to developments in the technological and competitive environment, with the result that internal accounting information is frequently inaccurate and misleading.

Despite the growing attention among SME towards non - financial performance measures, the information about the usage of non- financial performance measures within manufacturing SME is very little.

A study conducted by Mohamed Basheikh and Abdel – Maksoud [12], concluded that performance measures of "on-time delivery" and "efficiency and utilization" seem to be positively and significantly correlated with the levels advanced manufacturing technologies and the level of importance of aspects of competition. This study is consistent with a study by Ahmad [13] who suggested that performance evaluation systems are consistently associated with market competition.

Cambon et al. [14], describe three main approaches to the measurement of performance that may be basically distinguished:

a) result-based approach;
b) compliance – based approach;
c) process-based approach.

In the first, result-based approach, the so-called lagging indicators (also referred to as outcome or negative indicators) are applied for performance measurement. Whereas, for the two remaining approaches, leading indicators (also referred to as pro-active, positive or predictive indicators) are applied. Leading indicators (further referred to as pro-active performance indicators) being applied for the evaluation of effectiveness of internal system processes are referred to as operational performance indicators. Operational performance indicators provide information on the status of individual processes within the management system. As such, when tracked over time, such indicators provide information on progress of change within the management system and assist in forecasting future status and planning. Examples of such indicators include: the number of work stations at which risk assessment has been carried out or updated; percentage of employees trained in a given period; percentage of safety checks on machines and installations, as compared to the plan. Monitoring the value of such indicators allows getting a picture of how a given system operates at the shop-floor level, in contrast to

the results of structural performance measurement.

In order to create a relatively small set of KPI on the basis of a larger initial set of candidate indicators two basic approaches are possible: aggregation and selection.

Aggregation consists in determining the value of a higher-level performance indicator, with the aim to reflect values of all underlying indicators (sub-indicators) in a collective and synthetic manner. Such collective indicators are usually referred to as integrated, aggregate or composite indicators. In general the aggregation of the indicators can be performed by calculating means: arithmetic, geometric or harmonic, while the arithmetic mean, often also referred to as linear, is the most simple, and relatively the most widely applied method in the domain of management [11].

Where such large number of KPI is available, a decision – making problem appears, in which questions arise: which KPI should be selected from a given set or how to prioritize these indicators.

SME should take a number of steps before choosing the best KPI, including:
a) having clearly defined business processes;
b) setting requirements for the processes;
c) having qualitative and quantitative measurement of results;
d) determining variances and adjusting processes to meet their short-term objectives.

In selecting KPI, it is critical to limit them to those factors that are essential to the SME reaching its goals. It is also important to keep the number of KPI small just to keep everyone's attention focused on achieving the same KPI. If the SME key performance indicator is "increased customer satisfaction", that KPI can be focused differently in different departments: the Manufacturing Department has a KPI of "number of units rejected by quality inspection", while the Sales Department has a KPI of "minutes a customer is on hold before a sales rep answers". Success by the Sales and Manufacturing Departments in meeting their respective departmental KPI will help the SME meet its overall KPI.

By, example, to measure progress toward its customer calls KPI, The Customer Service Department will need to measure how many calls it receives and it must also measure how long it takes to answer each call. Then the Customer Service Manager can calculate the percentage of customer call answered in the first minute and manage toward improving that KPI. We can measure the number of calls by having each Customer Service representative count their own calls and tell their supervisor at the end of the day. We could have an operator count the number of calls transferred to the Customer Service department.

The best option, although the most expensive, would be to purchase a software program that counts the number of incoming calls, measures how long it takes to answer each, records that answered the call, and measures how long the call took to complete. These measurements are current, accurate, complete, and unbiased. Collecting the measurements in this way enables the manager to calculate the percentage of customer calls answered in the first minute. In addition, it provides additional measurements that help him or her manage toward improving the percentage of calls answered quickly. Knowing the call durations lets the manager calculate if there is enough staff to reach the goal.

Knowing which Customer Services answer the most calls identifies for the manager expertise that can be shared with other Customer Services. In this context, KPI can be used to set performance targets for the future, driving change and development, to describe and review historical performance. In literature, different KPI related studies have been conducted, for instance, May et al., [16] analysed the current state of the art on energy related production performance indicators in order to drive research gaps and industrial needs for equipment evaluation.

Table 1. *Examples KPI from SME*

Category	Key Performance Indicator
Customer	1.the status of existing customers 2. new customers they acquired 3. customer fidelity 4. segmenting customers by profitability or demographics 5. waiting time for customer orders
Maintenance	1. maintenance time/produced output over a time period 2. number of alarms over a time period
Personnel	1. accident/incident rate per number of man hours worked 2. considerate contractors score
Process	1. progress against schedule (days behind or ahead of schedule expresses as %) 2. % of required reports delivered on time 3. number of defects at 1 month post practical completion 4. average process overdue time 5. percentage of overdue processes 6. average process age 7. percentage of processes where the actual number of assigned resources is less than planned 8. number of assigned resources 9. sum of costs of "killed"/stopped active processes 10. sum of deviation of time against planned schedule of all active projects
Innovation process	1. number of identified unmet needs 2. number of ideas by staff 3. the number of new competencies for innovation 4. number of managers having training in the methods and tools of innovation 5. number of patents per year per employee 6. number of awards, publications 7. the higher rate of productivity 8. number of improved products, processes 9. lifetime of an innovative product 10. number of products launched in the last year
Quality	1. cycle time from request to delivery 2. call length – the time to answer a call 3. number of escalations - how many bad 4. number of reminders – how many at risk 5. number of alerts – overall summary 6. customer ratings of service – customer satisfaction 7. number of customer complaints – problems
Efficiency	1. cycle time from request to delivery 2. average cycle time from request to delivery 3. volume of tasks per staff 4. number of staff involved 5. number of alerts 6. customer ratings of service 7. number of customer complaints 8 .number of process errors 9. number of human errors 10. time allocated for administration, management, training
Control performance	1. number of control loops in manual mode/total number of control loops 2. variance of control error (set-point-measured value) 3. setting time after a set-point change
Equipment	1. heat transfer rate of heat exchangers 2. number of valve openings for a valve or total valve opening travel distance 3. vibration amplitude of an equipment 4. employee suggestions/ employee competence measures/employee morale
Financial	1. cash flows 2. product profitability 3. return on sales 4. return on capital 5. return on equity
Environmental	1. energy consumption (MWh/m^2/year) (gas, electricity, heat, oil, biomass, etc) 2. % by weight, of construction waste sent for recycling 3. Hours of industry activities 4. percentage use of recyclable materials 5. amount of pollutant discharge
Competitor	1. delivery performance 2. price performance 3. quality performance 4. proportion of new products 5. new-product development cycle time
Market and customer	1. share of market 2. response time 3. warranties, claims, returns 4. market/channel/customer profitability 5. customer satisfaction or dissatisfaction indices
Business process	1. product (defect, scrap, rework, waste etc.) 2. order to delivery response times 3. manufacturing cycle time 4. sales (production) per employee 5. inventory turns 6. reinvestment indicators 7. health and safety performance

More precisely, a KIP is an item of information collected at regular intervals to track performance of an SME or system at any level (such as production machine or plant or unit) that produces output (products or service) using resources of different types. During the design process, KPI can be used to compare the performance of alternative technologies or manufacturing systems and the trade-off with quantities and costs on the relevant resource usage. The following KPI (in table 1) are examples, many more are of course possible (this is a list to find inspiration from).

Van der Stede and al. [17], argued that regardless of strategy, SME with more extensive performance measures, especially that included objective and subjective non-financial measures, have better overall performance and also demonstrated that non-financial performance measures are better than financial measures in helping organizations implement and manage new initiatives. Within the family of non-financial performance measures, those related to customers have a higher adoption rate compared to the other non-financial measures.

David Parmenter [18] said: *"there are many companies which measure different KPI periodically, however, I can show them, that those measurement do not create changes, growth and regulation and have never KPI"*. When managers are making a mustache when trying to measure and calculate all, that can be measured/calculated although they do not understand exactly what they are measuring and why. Making the effect, that something is done and is doing also at this moment in this field, is pointless. Thus, manager should pay attention that:

- the less KPI , the better,

- the meaning of each KPI needs to be simple and clear,

- KPI drives desired outcomes,

- KPI consist of financial and non-financial metrics and don't disrupt each other. Managers should know not only what common problems, questions and situations are appearing in SME processes in different fields (not only production, but also logistic, quality). To attain superior relative – performance by KPI, an SME must achieve its expected objective with greater effectiveness and efficiency than its competitors (fig.1). Effectiveness and efficiency are the two fundamental dimensions of performance – this is emphasized by Neely et al., [19]: *"Effectiveness refers to the extent to which stakeholder requirements are met, while efficiency is a measure of how economically the firm's resources are utilized when providing a given level of stakeholder satisfaction."* SME performance depends on whether the company can adopt appropriate strategies in order to best align the internal/external resources with its objectives. Internal factors include SME resources, capability development, strategic objective formulation; internal process management; and, innovation and performance management. External factors include; environmental factors – including the influences form customers; strategic partners; competitors; and regulation. Every factor that is related to an enterprise would influence the company's performance. Each factor interacts with others.
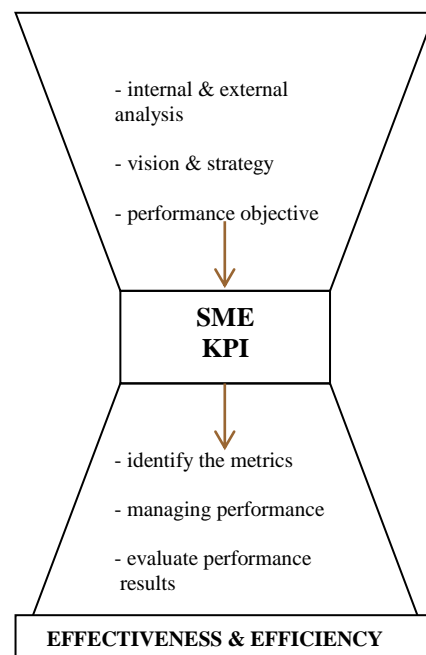

- internal & external analysis

- vision & strategy

- performance objective

SME KPI

- identify the metrics

- managing performance

- evaluate performance results

EFFECTIVENESS & EFFICIENCY

Figure 1. *KPI clepsydra*

To set performance indicators, a performance factor analysis should be carried out, which helps map out the performance case-and-effect. The leader's decision is quite important for successfully implementing performance measures and the involvement of all of the employees in selecting KPI is even more important. It is not good that only managers were involved in the action. At the same time, customer feedback helps an SME identify the performance issues quickly. Internal and external communication is very important for a good teamwork [20].

KPI are derived from the SME performance objectives. Each performance objective can be measured by several key performance indicators. James Harrington [21] said: "*Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it.*"

In the past, SME have been somewhat slow in adopting quality initiatives, not only due to excessive managerial involvement in day-to-day entrepreneurial activities that typically focus on sales strategies and market growth but also because they are less comfortable with the introduction of total quality management. Although SME are usually associated with lack of competencies and resources, intense competition has forced them to increasingly adopt more formal quality system strategies as it assumed that total quality oriented firms tend to evidence high levels of productivity and competitiveness (Crosby, Deming, Juran). Large organizations have thousands of processes, but can build effective control systems based on a few key measurements. This should be even simpler for a smaller, les complex company. The difference between small, medium and large firms can be substantial sometimes: from example, while smaller firms seem to feel they are disadvantaged by the lack of resources available to larger companies, they are less complex. This should give them the advantage of being more flexible and adaptable and have KPI that present a mirror of the SME performance. SME have fewer organizational levels, less horizontal differentiation, fewer and less complex processes, fewer and less specialized personnel. However, the advantages of flexibility and simplicity seem to be outweighed by the lack of understanding of total quality management and a need for a quick return. The measurement systems should be geared towards improving internal process and consumer satisfaction. Improvement is the responsibility of everybody in the SME, everyday, all the time.

SME sector performance is sine qua non to the performance of the nation. According to Eniola and Ektebang [22], small and medium scale enterprises have been acknowledged to have a prodigious potential for sustainable development.

In today's world KPI are essential for planning and controlling through consolidating information, creating transparency and thereby supporting decision making of the management. Important non-financial KPI are productivity, quality, time and immaterial assets. Nevertheless, only by considering both financial and non-financial KPI it is possible for a SME to holistically gain information about business issues. Additionally, important characteristics for good KPI are that they are measurable, unambiguous, understandable and comparable [23].

Consequently, KPI need to fulfill some fundamental requirements:

- the KPI must be able to quantitatively measure the extent to the customers' requirements;

- the KPI must not leave any room for interpretation or manipulation;

- the KPI should be the cause of conscious decisions.

Conclusions

With regard to this material collection, the literature search was based on the following pair of keywords, jointly found in title, keywords or abstract, in English – speaking

peer – reviewed papers on the performance measurement system reporting in small and medium enterprises, covering the fifteen – year-period from January 2001 to October 2015: "KPI", "SME", "performance measurement", "small enterprise", "medium enterprise", etc.

In the last years small and medium sized enterprises, the backbone of the economy, moved into focus of many authors in their scientific work. Considering the productivity issue, the measuring and improving of SME activities was and still remains the main research and is a real challenge to all enterprises and managers.

Performance measurement system is a group of techniques developed by the SME to evaluate the performance of business activities.

Key Performance Indicators are important for monitoring the performance in the industry. Different types of performances can be measured by KPI, for example energy, material, control and operation, maintenance, etc.

Actions for performance improvements can be developed, prioritized and implemented based on the KPI.

Performance indicators can be defined as variables whose purpose is to measure changes in a process or a function. Indicators must be clearly defined, accessible and transparent. They can be used to identify poor performance and the improvement potential.

KPI are an effective management tool because they translate complex measures into a simple indicator that allow decision makers to assess the current situation and act quickly. Characteristics of KPI (fig.2):
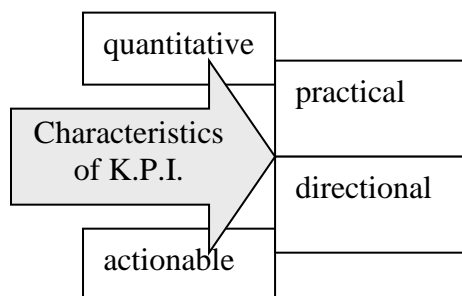

Figure 2. *Characteristics of KPI*

a) quantitative: KPI can be presented in form of numbers;
b) practical: KPI integrate well with present SME processes;
c) directional: KPI help to determine if a SME is getting better;
d) actionable: KPI can be put into practice to effect desired change.

The definition of the basic principles for the development of the KPI, are:
a) truly representative of the success of the main goal;
b) verifiable to avoid misrepresentation of results;
c) useful and available on time to influence decisions;
d) linked into systems allowing feedback of information for the decisions-making.

For KPI to be effective, however, they need to be actionable-meaning they should report on the metrics that matter to the SME.

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