DIFFICULTIES IN SMES AND KPI SELECTION MODEL AS A SOLVER

Kaganski, S.; Paavel, M.; Karjust, K.; Majak, J.; Snatkin, A.

Abstract: Small and medium enterprises are seen as „backbone of the European economy“[1]. Nowadays, in „harsh environment” and difficult economic situation, to be able to survive, SMEs should not only optimize production, find new investors, rise effectiveness and productivity, but also change the way of thinking and try to understand all processes in production and company itself instead of just „driving forward with closed eyes“. The measurement of processes and company’s condition at present moment should be one of the keys to success. Continuous development and analyse would provide management team with plan of actions. The main objective of this paper is to introduce difficulties and problems, with which enterprises are faced in their life. Furthermore, to show concept of KPI selection model for enterprises, which would help to understand, what KPIs should be taking into account and studied by management and how those metrics can change the situation and solve all difficulties. In addition, during the applying of model, the amount of data and data flow in enterprise would be optimized.

Key words: Key performance indicators (KPI), Small and medium enterprises (SME), KPI selection model.

1. INTRODUCTION

The last twenty years have seen profound change in the private sector’s relationship with society. Globalization, deregulation, privatization and a reconsideration of the links between state and market have changed the basic principles on which private companies are expected to contribute to the public sector [2-3]. Additionally, the economic conditions in 2011/2012 in the World and in the European Union with new difficulties nowadays, due political issues and food embargo as a counter from Russian Federation, have crucial impacts on SMEs but still, this form of business is remaining the most important and widely spread. They are showing a better performance in comparing to big enterprises and corporations [4,5], additionally, the dynamic role of SMEs as a chine of the European economy seems to have been played important role in the recovery from the global crisis since 2008 [1]. On the one hand, SME cannot effort high cost researches and developments (R&D) like large enterprises, due the financial and economic aspects, on the other hand, the speed of implementation of new technologies and methods (Lehtimaki considered the importance of new ideas for product innovations in SMEs of Finland to top of management [6]), comparing with large enterprises, are high and not so much time and money consuming. Additionally, SME can be innovative in other ways - modernization of products and processes to win new markets (LE are not interested in small markets, they are trying to get a really wide spreading markets and big clients).

2. DIFFICULTIES THAT ARE APPEARING IN SME

Watt has distinguished following steps in the risk management process, which should be taken into account by managers [7]:

• Establishing the SMEs risk strategy;
• Determining the SMEs risk appetite;
• Identification and assessment of risk;
• Prioritizing and managing risk.

Also, if we try to divide problems, with which enterprises are facing, then there will be two main groups:
• Financial or economic problems (SMEs success is tied in with the local economy as the SME sectors market growth is usually at the same rate as the macro economy as a whole, therefore, if there is an economic downturn, SMEs will usually also experience difficulty [8].
• Enterprise based problems (human resource problems, multi-functional management, high employee turnover rate [one of the common problems nowadays], lack of skills and experience, low productivity and difficulties of finding quality staff [9].

Considering financial problems, SMEs have very limited bank finance, which is only around 10 per cent, while self-finance remains the major source of finance contributing 76.5 per cent of fixed capital and 51.8 of working capital [10]. In critical situations SMEs don’t have the buffer for not only investments in new technologies but also for covering additional costs during prices growth or projects recalculation. For example, according World Bank survey (2002) the lack of money for the majority of Bangladesh’s SMEs (55%) was the main issue, during their operation.

To reduce the impact of economic/finance issues on SMEs entrepreneurs should to [11]:
• Definite market opportunities;
• Pay more attention to team working;
• Choose or develop suitable marketing entry strategy;
• Operate the profitable ventures.

It is important to know, who the clients are and of course do not forget about competitors and comparing to them, what would be the main strengths and weaknesses. Additionally, entrepreneurs should think about the logistics and the prices should be also competitive. To open new firm and to start business is quite easy, but to stay afloat and continue to grow is very difficult.

When we are talking about measurements of economic aspects, then nowadays, the majority of SMEs has not established strict financial accounting system, including real-check, card-check and account-check. It’s is difficult to carry out the financial accounting procedure [12]. Although most SMEs apply basic financial accounting system but it does not match smoothly with the logistics, manufacturing, sales and cannot provide enterprises with complete information [13].

Considering the enterprise based problems, Employee Turnover is one of the common problems. “It is the ratio of the number of workers that had to be replaced in a given time period to the average number of workers” (Agnes, 1999) [14]. It is often utilized as an indicator of company performance and can easily be observed negatively towards the organization’s efficiency and effectiveness (Glebbeek & Bax, 2004) [15]. Due to limited growth of SME most of the skilled employees leave SMEs. According Levy, SMEs are knowledge creators but poor at knowledge retention [16]. Employee job satisfaction has influence on employee turnover in organizations. The extent to which an organization is able to retain its employees’ depends on the level of job satisfaction that is made available to these workers. [17]. However, taken into account nowadays situation, the main reasons of high turnover is salary. Young specialists are searching the best place, which could include a good salary, an interesting job and good additional opportunities for further rise. According to the European Statistic 2010, In a recent OECD (Organisation for Economic Co-operation and Development study (2009)) covering eleven countries for job turnover and twenty-two for labour turnover and using harmonized data, job turnover rates were estimated at 22% (of total employment) over the period 1997-2004, and annual average labour turnover
rates at 33% (of total employment) between 2000 and 2005 [18].

The high turnover rate is not only problem, that companies in Europe and in other countries should face. The Boston Consulting Group in their research is mentioning that in the nearest future, companies will face five critical HR challenges [19]:

• Managing talent;
• Managing demographics;
• Becoming a learning organization;
• Managing work-life balance;
• Managing change and cultural transformation.

Considering the nowadays situation, the lack of qualified workers is becoming more problematic with every year. HRM should be on the same level of importance, like the economic issues (turnover, consumer leverage ratio, retail sales and etc.). Managers should not forget that the main job is done by workers and the beneficial HRM is directly influencing the financial indexes of company. KPI of HR for management can help to make right decisions to changes the situation in enterprise.

3. KPI SELECTION MODEL

To understand the main purpose of bottlenecks and difficulties at company, the necessary measurements should be performed by management to be able to evaluate the impact of each factor. KPI selection model [20] should be seen as tool, which is able to identify the critical spots in enterprise and solve them in nearest future perspective. The idea is to use traditional methodical questionnaires to make management understandable and to bring out the main bottlenecks and weaknesses in the production and general enterprise processes.

On Fig 1 the main first phase of KPI selection model is been illustrated. The draft version was described in article Kaganski 2014 [20], however, during practical study, it would get final review and optimized. The first phase is questionnaire, which could be called also as a preparation phase. Survey for KPI has been built concerning the productivity KPIs. In this study, questions are constructed in this way, that by responding on them, the critical spots and problems would be identified. The questions are linked with KPIs that would be investigated after data collection. In turn, KPIs are divided by 3 groups:

• Direct KPI – indicators, which are in explicit relation to the responses;
• Indirect KPI – indicators, which are in connection to more than one question;
• Suggested KPI – indicators, which are proposed to the management for further studying.

In table 1, the example of distribution for KPIs from first phase has been shown. This kind of approach provides possibility to show management, if right KPIs have been followed (direct KPIs). Furthermore, depending of the problems, which would appear after analyse of the answers, suggestions can be provided to company, what could be measured.
<table>
<thead>
<tr>
<th>Question</th>
<th>KPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>What's the average age of white collars (Admin person) in your company?</td>
<td>% of employee over age 55</td>
</tr>
<tr>
<td>Your age range</td>
<td>Average age range of employee</td>
</tr>
<tr>
<td>What's the average age of Blue collars (factory floor persons) in your company?</td>
<td></td>
</tr>
<tr>
<td>How long have you been employed in the current enterprise?</td>
<td>staff turnover ratio</td>
</tr>
<tr>
<td>How many white collar employees have left your company during last year?</td>
<td>staff turnover ratio</td>
</tr>
<tr>
<td>How many Blue collar employees have left your company during last year?</td>
<td>staff turnover ratio</td>
</tr>
<tr>
<td>Company is offering appropriate training for the job, as well as specific Occupational Health’s Safety &amp; Welfare training?</td>
<td>Employee Training Index</td>
</tr>
</tbody>
</table>

Table 1. Example of question vs KPI

Indirect KPIs can be specified only by answering at least on two questions, which are connected to it. As for example, KPI-satisfaction can be followed in company only by knowing the situation with staff turnover, trainings and benefits availability and etc.
To eliminate misunderstanding and check the relationship between pairs “question-KPI” the sorting was performed in WEB resource “Optimal workshop” [21] by case study group. The case study group is group of researches, who has no connection to the study, but in spite of that has necessary knowledge and experience in the field.
Survey should be filled by workers from all areas, including “blue collars”, “white collars” and CEO. The independent point of view of each employee would help to construct the right representation.

4. CASE STUDY

The selection model would be tested on different manufacturing companies, which are dealing within divergent fields to evaluate the compatibility of it. Taking into account, that prevailing language at companies in Estonia can be divided to 3 main groups: Estonian, English, Russian, - the survey should be providing the opportunity to be used in any condition. After acquiring mandatory amount of data, analyse should be done. Each studied company would receive the methodology of improvement steps for the future and also, the whole picture of all enterprises by detection standard bottlenecks, would be analysed. Furthermore, the questionnaire is only one step of data collection and can be considered as manual way. The other opportunity is to use advantage of PMS (product monitoring system) and get data directly from machines, production lines to the database for further study. Wireless sensors would be attached to machine park and provide data of parameters: vibration, temperature, voltage consuming, which in turn could be used to prognoses the condition of tool. [22] The usage of wireless sensors would reduce costs (not need for cables and wires) and simplify the
assembly and installation. The advantage of this approach is the possibility to study KPI: OEE (overall equipment efficiency) and all related with it metrics. Online data flow gives the opportunity to make right decisions in instance and drive the production in right direction, which would save time, resources and nervous.

5. FURTHER RESEARCH

The KPI selection model would be tested in practice and acquired data analysed. Taking into account, that testing model on one enterprise isn’t enough for optimization, next points should be done/analysed:
- Optimization of KPI selection model (questionnaire & linked KPIs);
- Data from PMS as first step for further study;
- Different SMEs for collecting right amount of data.

6. CONCLUSION

Considering the efficiency of production in SMEs, HR issues, material flow and other critical subjects at companies, the measurement with further improvements and optimization remains general task for management. The difficulties, which were described in article, cannot be eliminated in an instant; however, the necessary measures could be done in order to avoid further difficulties. The KPI model structure and difficulties, which are occurring at companies, were described in this paper. Later steps were defined for next researches.

The KPI selection model could become the main fundament on which decisions and improvements would relay. Furthermore, it should simplify the work of management and make production more transparent. Optimization, data collection and analysing are foreseen as next tasks.

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8. REFERENCES


12. Zhengjin; Small and medium-sized enterprises financial management problems and countermeasures. *Business Administration (06), 2011*

13. Xuhui Y.; Ruoxi Z.; Discussion on SME financial management problems and countermeasures, *International Concerence on Artificial Intelligence and Software Engineering (ICAISE 2013)*


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