

# **Advanced Informational System Based on Controlling as a Way for SME Competitiveness**

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## **Abstract**

Small and medium enterprises (SME) are the backbone of European economy as well as they are great innovators. Without their active presence in economy we will lose business diversity environment and its competitiveness. SMEs and their tasks in European environment are standing on edge now. SMEs need impulse for its structural changes, implementing effective information systems and managerial system which create continuously improvement in managing system. Research of SMEs and ways how support their competitiveness is crucial for their success in future. This paper is focusing to using advanced information system operated on controlling and the goal of this research is recognise consequences between using these management style and SMEs performance.

## **Keywords:**

SMEs, controlling, management, process, ERP

## **JEL Classification**

M10, M15, L11, L15

## **1 Introduction**

The basic motivation for this research was recognise main areas for SMEs and family business with higher impact to their improving and successfully future develop. The results of this basic research will serve for advanced research of SME and family business in Czech Republic. This research is in progress and follows the research project of the vitality of family business and at present it is basic research.

## 1.1 Problem introduction

SMEs business environment is getting tighter and the competitive pressure exerted on SMEs is not only from global corporations but also from domestic major corporations. SMEs for its successfully developing and competitiveness need management tools which will support efficiency increasing and continual improvement. Solution should be ERP system based on controlling principles. Market business environment and entrepreneurship as such are now changing faster and less predictably due to a number of factors (globalisation, digitalisation, changes in shopping and communication habits of customers etc.). Achieving permanent success in this complex and dynamic environment has become very difficult, especially for small and medium-sized enterprises (Petrů, N. & Havlíček, K., 2017).

SMEs are backbone of Czech and European economy. SMEs are one of major economic force and their supporting is basic task for our government. SMEs employed 93 million people, accounting for 67% of total employment in the EU-28 non-financial business sector and generating 57% of value added in the EU-28 non-financial business sector. Almost all (93%) of the SMEs were micro SMEs employing less than 10 persons. (European Commission [online], 2017.)

SMEs and their performance are influenced by geographical and language factors. These factors are causing limitation of SMEs performance and their cross boarder cooperating inside Europe Union and also worldly. What is significant for SMEs and their limitation is a lack of advanced information systems boosted on some modern managerial system, which decreasing these negative factors influence. Research on geographical proximity for SME exporting has not focused on the inter-regional liability of foreignness between the European Union (EU) and its motivations, while it has been shown that SME internationalization performance is affected by geographical scope (D'Angelo et al., 2013).

Advanced information systems and its setting based on modern controlling should be effective solution, which is accessible for SMEs. The main limitations for its wider implementations are lack of implementation specialist, not developed implementation procedures and supporting by financial resources. Europe Union created and operating “Growth Program - Entrepreneurship and Small and medium-sized enterprises”, This strategy and its plan is one of major goals for changing present SMEs situation and support their continual developing. Firms look to adopt technological innovations in hopes of realizing a variety of positive outcomes, such as to increase productivity and attain higher service levels without expending more resources (Prahalad, C.K. and Mashelkar, R.A., 2010).

Implementation and usage of e-business as way of interconnection between business partners through modern information and communication technology (ICT) is on path of growth. Their effects in use are actual topic of many scientific and pragmatic research projects. Challenges of e-business development, growth and future implementation in companies across the world are in focus of strategies in many countries and political and economic associations (Pihir, I., 2013).

This situation understanding shows way, how is IT management area important for SMEs. Present advanced information systems (IS) are supporting SMEs basic operation, their continuously improvement and support enterprise managing with higher level of efficiency. Ideal platform for implementing is an ERP system. ERP in combination with modern controlling is powerfully and enterprises supporting management tool.

Controlling as a management tool in ERP is also helpfully at question of strategy managing and planning. SMEs are usually oriented to operational tasks and goals. Unfortunately, suppression of strategic management to the detriment of operational tasks is often the cause of a business failure, a weakening of its performance, and it should be leading to its bankruptcy. These ERP controlling systems are helping managing SMEs with higher efficiency as the same as use modern continuously improving managerial systems. Management activities depend on determination of the strategy (in the form of a strategic plan), followed by operational plans (marketing, sales, financial, human resources, innovation, etc.). (Havlíček, K., & Schlossberger, O. [online], 2013.)

## **2 Problem Formulations and Methodology**

Measuring and evaluating ERP systems based on modern controlling is tasks, where its direct solving is not possible. This system and its evaluation is possible by comparing and measuring some enterprise economic performance indicators in time periods. For this task is necessary check more than financial statements ratios, economic indicators or some levels of profit indicator, because it is insufficient. Qualitative research based on personnel interviews is needed.

### **2.1 Model and its validation**

The basic criteria for research model developing and its validation is understanding, how management and internal processes are working inside SME and divide this research to two main areas.

- Management system in SME
- Personnel acceptance of changes during implementation process

Research model main goals were understood how SMEs in Czech Republic operating management tasks in consequences of process maturity level and their economic performance are. General tasks were to be focused at information systems, human capital and its process level assimilation.

## **2.2 Quantitative research – research survey**

SME for this research is defined as a company under 50 million € turnover and under 250 employees. Research survey was focused on tasks of controlling, actual phase of usage some IS, measure and evaluate maturity process level.

The Capability Maturity Model Integration (CMMI) method was used for process levels and their maturity evaluating. CMMIs focus on improving processes in an organization. They contain the essential elements of effective processes for one or more disciplines and describe an evolutionary improvement path from ad hoc, immature processes to disciplined, mature processes with improved quality and effectiveness (Carnegie M. [online], 2006).

Research survey and its parts was verified on a sample of 11 enterprises, where the reliability was verified on the basis of an interviews. All research enterprises are examined in the Administrative Register of Businesses (ARES) and then placed on the list in Microsoft Excel for their analysis.

$$ROA = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

where:

- Net income is a company's total earnings (or profit).
- Average total assets are defined as the average amount of assets recorded on a company's balance sheet at the end of the current year and preceding year.

## **2.3 Qualitative research – personnel interview**

Data and its interpretation was used for qualitative research in sample of surveyed enterprises by personnel interview method. These interviews were focused on managerial style in company,

IS implementation, controlling usage in enterprise and acceptance of this system by people in organisation.

### 3 Problem solution

Researched SMEs were full filled data to e-survey. If company was recognised as a SME and passed the basic analysis, then was applicated a closer internal personnel research focused on management style, phase of implementation of IS, controlling usage and maturity process level – CMMIs method. This research process is comparing data from empirical analysis following periods from 2015 to 2017 and it is focused on implementation level of information system in SME and its impact to SMEs performance by comparing data from 2015–2017 periods. This research sample was created from SMEs based on personal visits and counselling. Number of SMSs joined to research is gradually increasing.

**Table 1: Development of IS implementation in SME compared with ROA**

| level of IS*                                     | 2015      |       |             | 2016      |       |             | 2017      |        |             |
|--|-----------|-------|-------------|-----------|-------|-------------|-----------|--------|-------------|
|  | comp. no. | in %  | average ROA | comp. no. | in %  | average ROA | comp. no. | in %   | average ROA |
| without information system                       | 8         | 24.2% | 2.6%        | 6         | 18.2% | 2.7%        | 3         | 9.10%  | 3.2%        |
| basic information system                         | 12        | 36.4% | 4.3%        | 14        | 42.4% | 4.6%        | 18        | 54.50% | 4.7%        |
| basic information system based on controlling    | 8         | 24.2% | 8.9%        | 12        | 36.4% | 6.7%        | 12        | 36.40% | 9.4%        |
| advanced information system based on controlling | 3         | 9.1%  | 12.6%       | 5         | 15.2% | 13.8%       | 11        | 33.30% | 14.2%       |
| not identified or lack of information            | 2         | 6.1%  | 6.3%        | 0         | 0%    | ---         | 0         | 0.00%  | ---         |
| <b>in total researched subjects</b>              | <b>33</b> |       |             | <b>37</b> |       |             | <b>44</b> |        |             |

\* scaling depending on IS and controlling implementation and operation level

source: author

The different view to process maturity level by CMMIs method and its impact to SMEs performance by comparing data from 2015–2017 periods offer following table no. 2.

CMMs method and process levels:

- Initial (chaotic, ad hoc, individual heroics) – the starting point for use of a new or undocumented repeat process.
- Repeatable – the process is at least documented sufficiently such that repeating the same steps may be attempted.
- Defined – the process is defined/confirmed as a standard business process
- Capable – the process is quantitatively managed in accordance with agreed-upon metrics.
- Efficient – process management includes deliberate process optimization / improvement.

**Table 2: CMMI process maturity level in SME compared with ROA**

| enterprise and its controlling CMM level | 2015      |             | 2016      |             | 2017      |             |
|--|-----------|-------------|-----------|-------------|-----------|-------------|
|  | comp. no. | average ROA | comp. no. | average ROA | comp. no. | average ROA |
| Initial                                  | 8         | 2.3%        | 6         | 2.2%        | 3         | 2.2%        |
| Repeatable                               | 12        | 4.2%        | 14        | 4.8%        | 18        | 4.6%        |
| Defined                                  | 8         | 9.2%        | 12        | 6.6%        | 12        | 9.6%        |
| Capable                                  | 3         | 12.9%       | 5         | 14.1%       | 11        | 14.4%       |
| Efficient                                | 2         | 6.3%        | 0         | ---         | 0         | ---         |
| <b>in total researched subjects</b>      | <b>33</b> |             | <b>37</b> |             | <b>44</b> |             |

source: author

### 3.1 Problem solution - analysis of the results

At the first is necessary to remind, that this basic research purpose is recognise main areas for following research, focus on main management tasks and define ways how to support SMEs and their developing. This basic research and its data analysis should be significant for advanced research.

Development of IS implementation in SME compared with ROA in periods 2015–2017 shows clear consequences between IS system implementation level and performance of SME measured by ROA. This significant ratio is increasing together by IS implementation level.

CMMI process maturity level in SME compared with ROA. In the case of CMMI, basically similarly duplicates development SMEs performance measured in table no. 1 depending on IS implementation level. Regarding on this basic data analysis the CMMI and IS implementation level are going together and each other support enterprise by increasing of management style and its performance.

Based on quality research and inside SME interviews there are other very importance factors, which are defending management system and its performance improving. The major factors are:

- People in organization – implementation of ERP system based on modern controlling brings to organization many continually changes, especially for the people. This is unfavourable factor for people. To successfully implementation is necessary give to education and people motivation minimum same financial and time resources capital importance as to other parts such in case of purchasing and customization of software and managerial parts.
- Financial capital requirements – the SME should decide for two solutions types. One is investing to ERP in “box quality” – it means by some not to well customized, but cheap ERP product. Second is use some full customized products and use full power of these systems. Unfortunately, the prices differences are really high. For better imagination “the box” solution will cost with implementation CZK 5–50,000 and customized solution like a SAP, VISION, ABRA etc. will cost amount in millions. As was recognised during research, the best practise is start with “the box” solution and in future upgrade it to some advanced customized system. This way decrease risk of financial looses in case of unsuccessfully implementation.
- Lack of implementation experts. This is also seriously problem, because on the market is enough of software companies, which offering IS or ERP implementation. Unfortunately, during implementation process is necessary check all process, optimising them and develop some continual improvement system based on controlling. There is lack of these kinds of expert and for successfully implementation is also needed find experts, which are able for people in organization motivating and lecturing, because without that is possibility of malfunction really high.

## Conclusion

This basic research shows areas and define tasks, which are crucial for future SMEs development and increasing of their performance. SMEs are the backbone of Czech Republic and European economy and this research should offer possibilities how to support them by SMEs awareness, looking for ways how to implement more efficiently and educate businesses in ERP implementation. Research results at on the sample of companies tested confirms the importance for ERP and controlling implementation to management style of SME. The researched companies sample which started or developed usage of information systems based on controlling were more stable and their performance and competitiveness increased. As the basic research shows, there are crucial points for successfully ERP implementation and its their successful overcoming depends on their mastery. The human factor and naturally changes refusing, lack of implementation experts and need for financial resources are crucial. The future research may be oriented on crucial tasks for technology, modern management and HR development with consequences with people in organization. ERP based on controlling and its successfully implementation and developing should be a way for SMEs competitiveness in near future.

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