

APPLYING CORRELATION ANALYSIS FOR EVALUATING THE CRM PERFORMANCE ON THE METALLURGY MARKET

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Abstract

Customer relationship management (CRM) has become a key strategic tool for many companies, especially in the current competitive environment. At a time when market competition becomes sharper, building relationships with customers coming to the fore, helping companies win obtaining new customers, developing products and services to increase customer satisfaction and observe current number of customers. The objective of this paper is to identify the priority factors in the implementation and management of the CRM systems in metallurgical companies. Evaluations are primarily factors reflecting the quality of customer information, support investment in CRM systems by the company management, the effects of implementation of CRM systems and business processes factors. Primary data have been collected by means of questionnaires in the Czech Republic and this was addressed to the metallurgical companies. Then, these factors were ranked using correlation analyse for identification the priority factors for customer satisfaction management system success in the Czech environment conditions. Long-term use of CRM systems brings to enhance the customer information usefulness and more efficient data management. The results indicate that expectations are met and CRM systems lead to more efficient customer information.

Keywords: Customer Relationship Management, correlation analysis, implementation, key factors, questionnaire

1. INTRODUCTION

Customer relationship management is a relatively young and new field not only in the world but mainly in the Czech Republic. It provides appropriate support for the management and effective supply of products and services to existing companys' customers. Abbreviation CRM is based on the phrase Customer Relationship Management. Good and quality driven customer relationships are key factors in the today's businesses success. CRM related to marketing and its modern concept oriented rather than anonymous mass market, but to communication with each individual customer. Modern marketing is built on the basic principles of classical marketing, which further develops that so-called relationship marketing with a strong emphasis on the relationship between the supplier and the customer. The aim of modern marketing is to acquire and maintain competitive advantage by satisfying customer needs, while maximizing comfort and an acceptable level of costs to customers. Quality is defined by the customer. It is not only the quality of the product itself, but all the related costs levels for customers. This approach is based on an effort to long-term sustain each individual customer. This process places great emphasis on services provided to the customers, not only to offer and sell only one product, but a complete service, which includes product. This entire process requires personal contact with customers.

2. THE CONCEPT OF CRM

The main goal of customer relationship management is gaining customer loyalty if the traditional target of the marketing strategies has achieved growth in the number of new customers. It is usually more useful and less expensive to keep existing customers who buy regularly and in large volume than constantly try to find new

customers. [1] Business philosophy called Customer Relationship Management considers Burnett as probably the most significant milestone in the development of marketing in the second half of the 20th century. [2] Natural continuation of the market segmentation philosophy enables the company to fully integrate marketing, sales and services functions to clearly define business priorities and to better plan and effectively use the resources of the company.

CRM is a system that tracks customer interactions with the company and allow employees to find information about the customer, such as past orders, service history, problem solving, etc. All records are kept and used with the only aim to make the customer happy, because it is the customer through which trade runs. [3]

According to Wessling [4] Customer Relationship Management is a proactive approach and maintaining long-term beneficial relationships with customers. Communication with customers is ensured by appropriate technologies, which represent for the shareholders and employees of the company separate processes with added value. The three main elements are the people (human capital, customers), processes (focus, blending) and technology (type, scope, and consistency of the application area). The meaning and purpose of these four elements is a comprehensive view of CRM. In order to implement CRM into existing organizational structures need to be addressed qualifications of personnel, technological equipment, focusing business processes and data management.

Brink, Berndt [5] describes CRM as a tool to support the marketing or sales department in a company that has continuity from the operational sections of the workplace (e.g. hotline or service center) to senior management (tactical and strategic planning, assessment traders, materials for access categories of partners, etc.). Customer relationship management is undoubtedly one of the key business activities for almost every company. It is not enough just to have in mind the requirements of customers. With CRM, companies are better able to manage and coordinate customer interactions across the entire company, as CRM helps to perfect usage of each customer contact. [6]

3. THE PROCESS OF IMPLEMENTING CRM SYSTEMS AND ITS BENEFITS

The implementation strategy of customer relationship management and implementation of CRM systems is an important project and pretty influence all company employees. Processes must be adapted. These changes are needed to drive and must be clearly understood by employees. The actual process of implementation of CRM systems involves several phases, including the definition of vision in relation to CRM, CRM philosophy must match the vision of the company, analysis and evaluation of internal and external environment in the form of strategic marketing analysis. Customers should be divided into different segments according to their needs and values for the company. CRM implementation objectives should include, increase the value of the customer base of the company, improve customer satisfaction and achieve a certain level of loyalty, etc. The implementation of CRM systems includes development of tactical and operational programs to achieve set targets in relation to individual customer segments. [7], [8]

Implemented CRM systems help to speed up and reduce the problems in the processing of business processes in marketing, sales and services provided because of the existence of a single database of customer's information. From CRM systems companies are expected to increase the quality and quantity of information and increase individual customer contacts. Time obtained by streamlining processes, it is possible to invest in an increase in the quality of relationships with customers. Satisfying customers' individual needs is a way to build relationships with existing customers and acquire new customers, which may result in improved image of the company in the market. [7], [9]

4. TRENDS IN CRM SYSTEMS

The trend in the implementation of CRM systems is creating a single view of the customer, which is a prerequisite for understanding their needs and requirements. Information system for customer relationship management uses 56% of large companies in Europe and North America, and 17% planned to purchase up to two years, which results from a study by Forrester Research undertaken by 455 companies. Worldwide sales CRM systems suppliers reached last year 18 billion USD, representing an annual growth of 12.5%. The largest supplier of CRM systems in 2012 became the Salesforce.com and SAP. Salesforce.com took over the position as the largest supplier in the CRM market; its sales reached 2.5 billion USD. SAP has maintained its leading position in the markets of Western and Eastern Europe. Western Europe and North America are for the supplier of CRM systems key markets that generate more than 80% of global sales in the market of CRM systems. The markets of Eastern Europe, Eurasia, Middle East and Africa offer market opportunities for CRM systems, as companies in these markets are investing in upgrading its infrastructure. According to consulting company Gartner European companies will invest in 2013 to the implementation of CRM systems 60 billion CZK, which is 7% more than last year.

In the Czech Republic the rate of use of CRM tools is relatively low, although companies are realizing that the wealth of each company is the customer. Priorities in the management of relationships with customers are winning new customers, retain existing customers and increase their loyalty. Customer relationship management system enables to meet these goals.

5. METHODS

The process of implementing CRM systems into the company structure is comparatively explored and known on the market. There are many studies and scientific publications describing this issue. After the companies implement specific CRM system is the issue of most of them, how to measure and evaluate the level of the implemented system. Absolute generalization in this area is not possible. The measurement cannot create in absolute form, which will be useful in every company. There must be a certain adaptation of the structure and the environment in which the company is located.

The source of primary data was a questionnaire. The basic tool was an electronic questionnaire prepared in accordance with the objectives set. Electronic polling was chosen despite the possibility of a low return rate, because the number of metallurgical companies in the Czech Republic is large and companies are too diffuse. The questionnaire was intended for executives, managers who are competent to fill in questions concerning the current status implemented CRM systems. The basic set consists of all respondents companies in the Czech Republic which satisfy classified in groups according to the Czech Statistical Office in terms of entrepreneurial orientation and firm size by number of employees. The selection of respondents was used judgmental sample where specified feature selection was firm size by number of employees. According to the identifier in the number of employees the companies can be divided into four categories according to the Czech Statistical Office. Each of these categories of companies were sent 100 questionnaires, a total of 400 companies were contacted. A total of 211 questionnaires were completed. The return was 52.75%.

The objective of this paper is to identify the priority factors in the implementation and management of the CRM systems. Evaluations are primarily factors reflecting the quality of customer information, support investment in CRM systems by the company management, the effects of implementation of CRM systems and business processes factors. Implementation factors of CRM systems in the questionnaire were defined based on the study of scientific foreign publications and articles. Subsequently, these factors were edited with the help of company's managers and marketing professionals due to different business conditions in the Czech Republic. Data are mostly ordinal nature where respondents assessed the factors for use Lickert range. Data were analyzed using the statistical program SPSS. Then, these factors were ranked using correlation analyze for identification the priority factors for customer satisfaction management (CRM) system success in the Czech

environment conditions. In general the correlation measures the degree of association of two variables. The two variables are correlated, where certain values of one variable tend to occur along with certain values of the second variable. The extent of this tendency can range from a lack of correlation to the absolute correlation. [10] The basis for measuring the intensity of the linear dependence of two variables (x_1 and x_2) in the sample covariance is [11]:

$$s_{x_1x_2} = \sum_i^n \frac{(x_{1i} - \bar{x}_1)(x_{2i} - \bar{x}_2)}{n - 1} = \frac{Q_{x_1x_2}}{n - 1}. \quad (1)$$

The aim of measuring the intensity dependence is an idea about the extent to which the behavior of one variable infers the behavior of the second variable. For the association degree can be used, for example, ordinal Spearman correlation coefficient r_s or Kendall's coefficient τ_B . [11] Using the correlation coefficient is measured the strength of the relationship between two variables. Different correlation coefficients measured strength of the relationship in various ways. Kendall's coefficient τ_B has unlike the Spearman correlation coefficient simple probabilistic interpretation. [10] The degree of association is usually number from the interval (0,1), which expresses the strength of dependence between two or more of the analyzed statistical characters. In this paper is applied to express the degree of association Kendall's coefficient τ_B , because works with a geometric mean for ordinal variables. Kendall coefficient τ_B is selected relative to the ordinal nature of the data and is used in cases where data is not normally distributed. Kendall's correlation coefficient is more immune to variations.

6. RESULTS AND DISCUSSION

The level of use of CRM systems in companies in the Czech Republic is still relatively low. The results quite clearly show that CRM systems are still not among in the basic management and software companies' equipment in the Czech Republic. Within the total cumulative, companies that use CRM systems and those that are at least partially implemented a relatively high number 65% of companies. However, only 38.9% of companies have implemented this system fully. A kind of indicator of future development may be 7.1% of companies, which expresses readiness to implement CRM system in the near future. Given that the demands of the customers on the quality of their processing requirements continue to rise, this number is relatively low. The period during which the addressed companies use CRM systems is relatively long. The three most represented categories includes companies with a period of 1-3 years of implementation, more than 7 years and 4-6 years, only 10.6% of companies have implemented CRM almost a year ago.

Table 1 The degree of association between the duration of CRM use and quality factors of customer information

		Correlations		
		How long do you have CRM system in your company?		
		Correlation Coefficient	Sig. (1-tailed)	N
	Information availability about customers	.035	.353	94
Kendall's tau_b	Customer information usefulness	.176	.028	92
	Estimation of the potential purchasing power of customers	.140	.061	88
	The overall higher quality of customer information	.074	.211	93

Dependence is demonstrated by correlation analysis in factor *customer information usefulness*, in this test is the significance of this factor less than 0.05 (see **Table 1**). Feeling of customer information usefulness grows with the length of CRM systems usage, but the dependence is very weak, because Kendall's coefficient is equal to the value of τ_B 0.176. This result can be explained by the fact that after prolonged use of CRM,

companies are also able to better assess the degree of customer information usefulness in these implemented systems.

Table 2 The degree of association between the duration of CRM use and factors of support investment in CRM systems by the company's management

		Correlations		
		How long do you have CRM system in your company?		
		Correlation Coefficient	Sig. (1-tailed)	N
Kendall's tau_b	Investment support from management	.113	.109	89
	Implementation of CRM by ideas and plans	.043	.317	88
	Full integration of information systems into CRM	.235	.004	90

Dependence is demonstrated between the length of CRM systems usage and evaluating that information systems were fully integrated into CRM (see **Table 2**). It can be assumed that among these factors is the dependence, as long as companies have implemented CRM systems, the information systems should already be fully integrated within CRM. The degree of association results from the correlation analysis between these systems. The more companies use CRM systems, the more positive rating factors is the full integration of information systems into CRM. The value of Kendall coefficient is in the range from 0.2 to 0.4, dependence degree is weak.

Table 3 The degree of association between the duration of CRM use and factors of the CRM systems implementation effects

		Correlations		
		How long do you have CRM system in your company?		
		Correlation Coefficient	Sig. (1-tailed)	N
Kendall's tau_b	Save time at work	.175	.025	94
	The increase in labor productivity	.167	.032	93
	Savings in communication costs	.075	.194	94
	Improving sales forecast	.206	.011	94
	Improving the planning and management of sales	.200	.014	92

There is a correlation between the length of CRM systems usage and four factors (see **Table 3**). The results show quite clearly that the feeling of saving time at work, increasing labor productivity, improving sales forecasts and improving the planning and management of sales increases with length of CRM usage. Dependence has not been established between the length of CRM usage and the cost of communication. It can be concluded that the costs of marketing communications are not affected by the length of the functioning of CRM success in companies.

CRM systems help in the long term to optimize marketing campaigns (see **Table 4**). Weak dependence is established between the lengths of use and optimizes the planning of marketing campaigns. Likewise, the weak dependence by correlation coefficient ranging from 0.2 to 0.4 is demonstrated by simplifying the management of contracts and streamlining data management. Simplifying and streamlining the contracts management and the data is reflected to the length of CRM usage. Correlation analyze has not been proven correlation between the length of CRM usage and flexible production planning. On the contrary, according to Kendall's coefficient been demonstrated weak dependence within the overall evaluation process CRM and length of CRM systems usage.

Table 4 The degree of association between the duration of CRM use and business processes factors

		Correlations		
		How long do you have CRM system in your company?		
		Correlation Coefficient	Sig. (1-tailed)	N
Kendall's tau_b	Flexible production planning	-.034	.374	65
	Better links between suppliers and manufacturers	.162	.053	73
	Improved control of dealers/distributor	-.053	.288	84
	Simplification workflow	.097	.140	92
	Optimizing the planning of marketing campaigns	.214	.009	89
	Simplification contract management	.260	.002	83
	More effective data management	.215	.010	92
	Overall assessment CRM processes	.188	.019	93

CONCLUSION

The aim of this paper was to identify key factors CRM systems implementation that is crucial for long-term use of CRM systems. Identification of these key factors should contribute to more effective customer relationship management. Long-term use of CRM systems brings to enhance the customer information usefulness and more efficient data management. The results indicate that expectations are met and CRM systems lead to more efficient customer information. If customer data is processed and sorted efficiently, it follows that the possibility of segmenting customers and identify key customers. In the long term the companies to improve sales forecasting, and simplify planning and sales management.

Using correlation analysis was evaluated the effect of the CRM systems usage in the evaluation of individual factors CRM. The evaluation factors, quality of customer information has been proven correlation between the length of CRM systems usage and the customer information usefulness. Feeling the customer information usefulness grows with the length of these systems usage. The correlation coefficient has a low value, i.e. strength of this dependence is very weak. In terms of the CRM systems usage has been demonstrated dependence on the factor of the full integration of information systems into CRM. Within the group of factors, effects of CRM systems implementation must be taken into account and assessed factors saving time at work, employee productivity, forecasting sales forecasts and improve planning and sales management to be CRM systems in the long term considered effective.

The factors rate that affect the CRM systems implementation and defining their role in performance CRM systems measurement, lies in the strength of dependence between the length of CRM usage and each dependent factors. The assessment process in the long run results an improvement in the optimization planning marketing campaigns, streamlining contract management and more efficient data management. Also assessment of the overall benefits of CRM in the long run is improving. The values of the correlation coefficients are in most cases low or very low, so a high degree of association was not detected in any of the evaluated factors. We still consider monitoring these factors in companies, which have implemented or intend to implement CRM systems, as key in terms of assessing the level of exposure factors and defining their role in measuring the these systems performance.

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