Comprehensive Maturity Model
for Customer Relationship Management

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The implementation of the Customer Relationship Management (CRM) is usually connected to high risks and uncertainties. Despite the fact that CRM Maturity Model may be considerably helpful for increasing the effectiveness of CRM initiatives, this field suffers from the lack of a comprehensive model that integrates all aspects in place. The paper describes the research provided according to Becker's procedure model for Maturity Models development. The systematic literature review that was performed according to the approach suggested by Saunders helped to determine 83 CRM Critical Success Factors (CSF) and 4 maturity levels. To analyse the determined CSF and maturity levels a 5-piont Likert Scale questionnaire was developed. The assessment was provided using Structural Equation Modelling and Cluster Analysis. The proposed CRM Maturity Model with a comprehensive, 360°-view on CRM Critical Success Factors can help companies to assess and develop their CRM business-processes, reduce implementation risks and uncertainties.

1. Introduction

The most widely implemented strategy for managing company's interactions with customers, clients, and sales prospects is the Customer Relationship Management (CRM). It involves using technology to organize, automate, and synchronize business processes – principally sales activities, but also those for marketing, customer service, and technical support [1].

The main goal of the CRM strategy is to change organizations from a products-centric to a customer-centric philosophy [2]. Its main objectives are to target, acquire, develop and retain valuable customers [3].

Potential benefits of the CRM strategy for the organization are as follows [4,5]:

- increased customer satisfaction and loyalty;

- increased customer acquisition, retention, and development;

- increased customer profitability and live time value;

- increased quality and customisation of companies products and services;

- decreased costs of the related business-processes.

All together the mentioned benefits may give companies a significant edge on their competition [6].

The CRM strategy implementation is usually connected to high risks and uncertainties [7].Therefore, many CRM initiatives are far from being effective [8].

Batenburg and Versendaal in 2007 showed that the CRM efficiency is positively correlated with the degree of maturity. Thereby, a CRM Maturity Model should be implemented in order to assess the CRM strategy status within an organization and to identify and to prioritize key practices required to increase its maturity.

Following Gamm, Maturity Model is a sequence of several maturity levels that an organization can reach, usually over the course of years in a step-by-step evolutionary process [9].

Basically, a Maturity Model includes the following components [7]:

- Critical Success Factors (CSF);

- maturity levels;

- an assessment system.

Bruno and Leidecker define CSF as characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in particular industry [10].

According to Paulk, maturity level consists of a set of process goals that, when satisfied, stabilize an important component of the business process. Achieving each level of the maturity establishes a different component of the business process, resulting in an increase in the process efficiency.
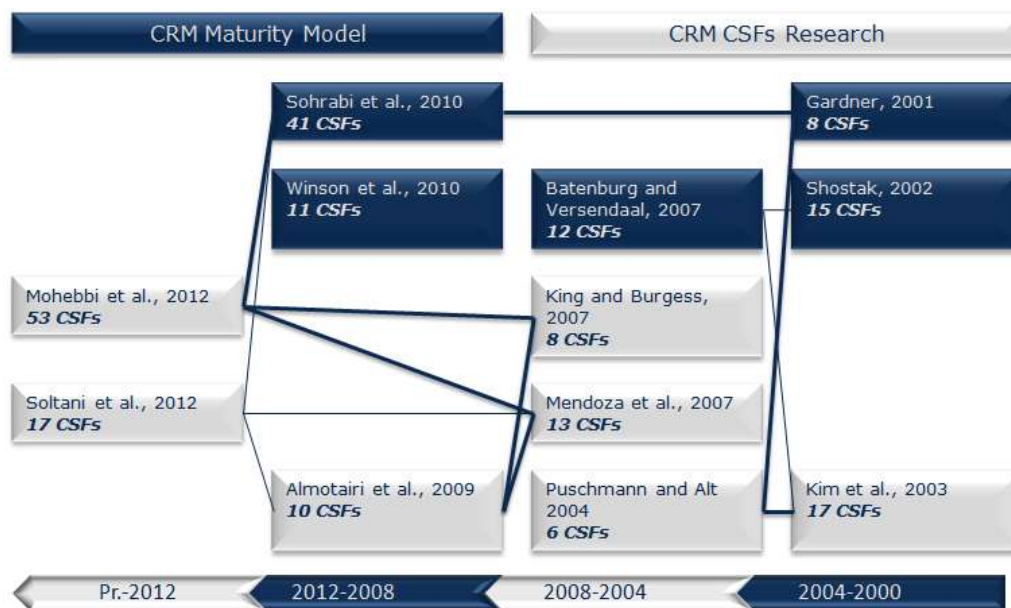
Fig. 1. Main researches in the field of the CRM maturity and CSF

At the same time, business efforts should focus on the needs of the organization in the context of its business environment, and practices of the higher maturity levels may address the current needs of an organization or project. It means, for example, that the practice that should be fully implemented on the higher level of maturity, can be established on the lower level [11].

Batenburg and Versendaal state that existing CRM Maturity Models indicate that maturity grows from the product orientation towards the customer orientation. The lowest maturity level implies minimal if any regard to the customer. The highest maturity level supposes the full focus on the customer in the entire organisation across all business processes. The customer is considered as the driving force behind the actions taken by sales activities, marketing, customer service, and technical support [6].

2. Literature Review

The systematic literature review to analyse Customer Relationship Management Maturity Models and to identify Critical Success Factors was performed according to the approach suggested by Saunders, et al. in 2009 (see figure 2) [12] and enhanced by the backward-review and the forward-review [13].

As the result, 237 relevant papers were indentified. From these sources, 83 Critical Success Factors, 16 CSFs subgroups, and 4 CSF groups were discovered. Also, the identified literature allowed to determine 4 maturity levels and appropriate assessment system.

Main researches in the field of the CRM strategy status assessment and links between them are shown in the figure 1.
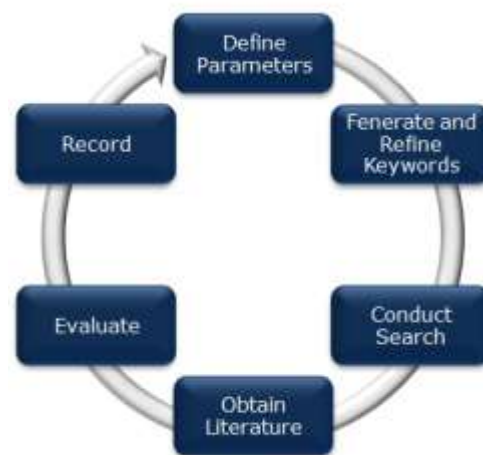

Fig. 2. The literature review process

The empirical research dominates the analyzed literature. 62% of the researches are exploratory surveys and more than 20% are case studies.

All presented in the figure 1 CRM Maturity Model researches are poorly interconnected, consider different CRM CSF, and none of them takes into account latest papers on CRM CSF. Thus, a tradition of information systems research in which replication and extension of theories and models and development of standard constructs and metrics define the research field and make contribution into knowledge about it is broken. Also, many authors neither did not validate instruments of data collection nor provided the reliability testing. Data gathered with non-validated instruments is questionable and the results of its interpretation without testing can be unreliable [14].
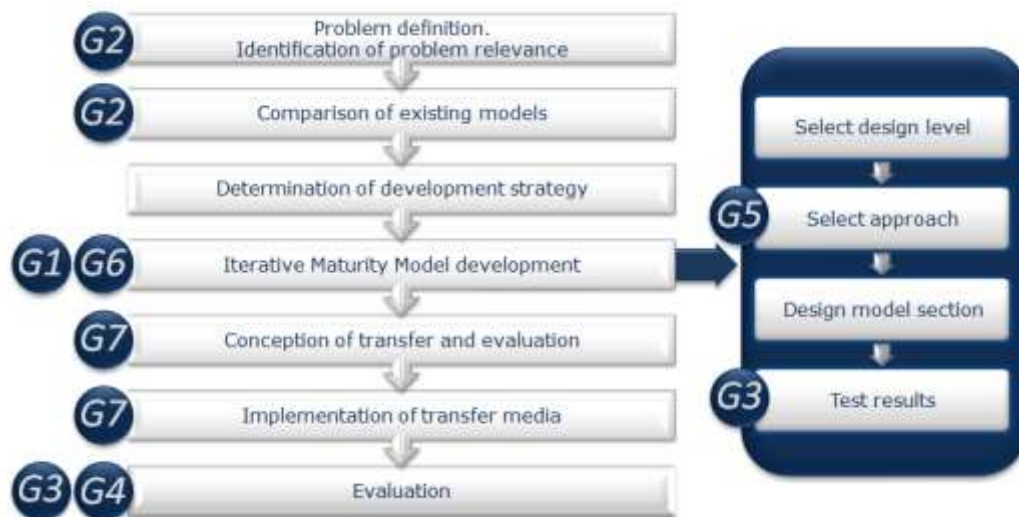
Fig. 3. Procedure Model for Maturity Models development

Thereby, despite the fact that many Maturity Models were developed in the field of CRM and each of them consider some important factors of the CRM strategy successful implementation, this field suffers from the lack of a comprehensive CRM Maturity Model that integrates all aspects in place. Thereby, the development of the Maturity Model with a comprehensive, 360-degree view on CRM success factors is an actual problem.

3. Methodology

The CRM Maturity Model research is carried out in the field of the Design Science, and, therefore, its design must follow seven guidelines for Design Science defined by Hevner in 2004 (see figure 4) [15] and should be made in accordance with the Procedure Model for Maturity Models development proposed by Becker in 2009, that is presented in the figure 3 [16].

Fig. 4. Guidelines on Design Science research

Considering results of the systematic literature review and basic Maturity Model development strategies mentioned by Becker, the Maturity Model development strategy in the research can be stated as «Combination of several Maturity Models, taking into account used in them CSF subgroups and hypothesis, into a new one and its enhancement».

3.1. Research Methods

To identify CRM CSF and maturity levels the systematic literature review was used.

According to the results of the literature review, an exploratory empirical questionnaire based survey was conducted for the data collection to determine significant CSF from the initial set of identified factors and to identify the structure of maturity levels.

The identified CSF were analysed using Structural Equation Modelling. The structure of maturity levels was determined using Cluster Analysis.

4. Artifact Description

The proposed comprehensive CRM Maturity Model provides a framework for organizing the continuous improvement of CRM strategy into four maturity levels that define a scale for evaluating the CRM efficiency of an organization and consists of three basic components:

- Critical Success Factors;
- maturity levels;
- an assessment system.

4.1.Critical Success Factors

The systematic literature review allowed us to determine 16 CRM CSF subgroups and hypothesis underlying them (see the table 1). Within determined subgroups 83 Critical Success Factors were defined [1].

Boulding in 2005 classified core factors influencing the CRM performance into three CSF groups of Processes, Human Resources, and Technology [17]. During the systematic literature review additional CSF group – Environment – was identified. Therefore, all CSF

Fig. 5. CSF groups

subgroups were divided into four CSF groups as shown in the figure 5.

Table 1. CSF subgroups and underlying hypothesis

Author, year	CSFs	Hypothesis
Gartner, 2001	Knowledge Management	The more evolved the knowledge management is, the higher the CRM efficiency is
	CRM Software	The more equipped the CRM software is, the higher the CRM efficiency is
	Continuous Assessment Performance	The more CRM aspects are assessed, the higher the of CRM efficiency is
Shostak, 2002	Marketing	The more productive the marketing is, the higher the CRM efficiency is
	Sales	The more customer-oriented sales are, the higher the CRM efficiency is
	Services	The more qualitative services are, the higher the CRM efficiency is
	Employee	The more qualified employees are, the higher the CRM efficiency is
Kim, et al., 2003	Customer	The more developed customers are, the higher the CRM efficiency is
Puschmann, et al., 2004	Technology Integration	The more integrated the IT infrastructure is, the higher the CRM efficiency is
Sohrabi, et al., 2010	Internal Environment	The more auspicious the internal environment is, the higher the CRM efficiency is
	Strategy	The more effective the strategy is, the higher the CRM efficiency is
	Culture	The more customer-oriented the culture is, the higher the CRM efficiency is
Winson, et al., 2010	Organization Interaction	The more customer interaction components are customer-oriented, the higher the CRM efficiency is
	Organization Integration	The more organization is involved in the CRM, the higher the CRM efficiency is
Mohebbi, et al., 2012	External Environment	The more auspicious the external environment is, the higher the CRM efficiency is
Soltani, et al., 2012	CRM Hardware	The more productive the CRM hardware is, the higher the CRM efficiency is

4.2. Maturity Levels

Commonly, maturity levels sequence is divided into two types:

- from chaotic to optimized;
- from product-oriented to customer-oriented.

In the proposed comprehensive CRM Maturity Model the second levels structure, which is applied more frequently in this case, is used.

Thereby, maturity levels were structured and named as follows:

- maturity level 1: Product Oriented;

- maturity level 2: Infant Customer-Oriented;

- maturity level 3: Adolescent Customer-Oriented;

- maturity level 4: Adult Customer-Oriented.

4.2. Assessment System

The proposed Maturity Model comprises an assessment system of two parts:

- Structural Equation Modelling for the CSF analysis;

- Cluster Analysis for the determination of the structure of maturity levels.

5. Evaluation

The proposed comprehensive CRM Maturity Model was validated through the exploratory survey using the developed 5-point Likert scale questionnaire and the web server-based application LimeSurvey.

The questionnaire was completed without noticeable difficulties by a total of 321 respondents. The population of respondents includes CRM experts from the academic environment in Russian Federation as well as those working in the industry and has already participated in several CRM projects.

The CRM environment in Russian Federation deals with regular CRM approaches, problems, successes, and failure. Therefore, the results of the empirical research can be transferred to most of the developed countries [18].

5.1 CSF Analysis

The analysis of the Critical Success Factors states that 80 of them are significant in the analysed domain. The number of insignificant factors includes Market Share and Competitive Position Measurement, Customer Profitability and Customer Lifetime Value [1].
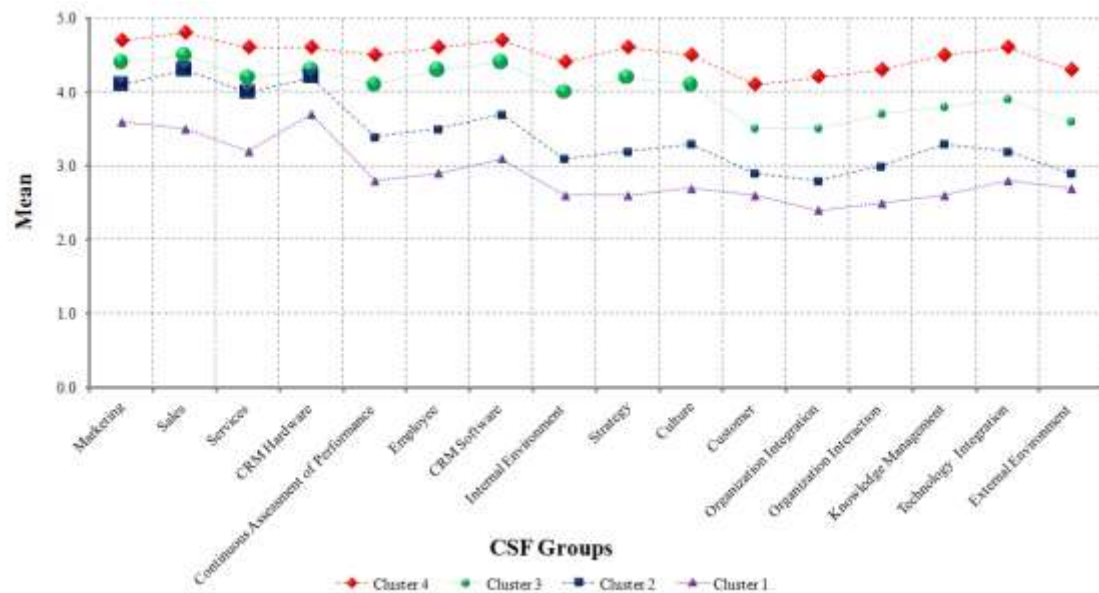
Fig. 6. Mean values of the clusters per CSF subgroups

The reliability analysis demonstrates that all variables complete a reliable scale. It appeared that CSF per subgroup have strong inter-correlations and, therefore, indicate one dimension. The results of the Structural Equation Modelling support tested hypothesis.

5.2 Maturity Levels Analysis

To determine the structure of maturity levels the Cluster Analysis was used. The data for the analysis represented average summed scales for every CSF subgroup [19].

In order to find a globally optimal partition of a given data into a specified number of clusters, the Generic K-Means cluster algorithm was used [20]. The Mahalanobis Distance has been used as the distance measure to avoid distorted results because of correlated CSF subgroup values [19].

Fig. 7. Structure of maturity levels

The results of the clustering are illustrated in the figure 6. The mean ≥ 4.0 characterizes the implemented CRM initiatives while the lower values describe the Critical Success Factors in transitional states [19].

The organizations in cluster 1 show initial initiatives in the CRM field and represent the maturity level 1: Product Oriented. All CRM success factors are established but not fully implemented.

The companies forming cluster 2 show the high mean value of the Marketing, Sales, Services and CRM Hardware CSF. They are assigned to the maturity level 2: Infant Customer-Oriented.

The organizations in cluster 3 show the transition phase from the product-orientation to the customer-orientation with the additional implementation of the following CSF: Continuous Assessment of Performance, Employee, CRM Software, Internal Environment, Strategy, and Culture. These companies are on the maturity level 3: Adolescent Customer-Oriented.

The organizations forming cluster 4 show a very high average score for every CSF subgroup. This is represented by the maturity level 4: Adult Customer-Oriented.

The resulting structure of maturity levels is presented in the figure 7.

4. Conclusion

Basing on the systematic literature review, this paper presents an overall picture of the CRM Maturity Model research field. The results of the review reveal that the main researches of the CRM Maturity Model are poorly interconnected, consider different Critical Success Factors and the field suffers from the lack of a comprehensive CRM Maturity Model that integrates all aspects in place.

To fill the discovered gap a comprehensive CRM Maturity Model was proposed. It consists of 80 Critical Success Factors and four maturity levels (from product-oriented to customer-oriented). All proposed CSF and

hypothesis underlying them were discovered through the systematic literature review.

The proposed comprehensive CRM Maturity Model was validated through the exploratory empirical survey using the developed 5-point Likert scale questionnaire and the web server-based application LimeSurvey. The questionnaire was completed without noticeable difficulties by a total of 321 respondents from various organisations of the Russian Federation.

The reliability analysis demonstrates that all variables complete a reliable scale. It appeared that CSF per subgroup have strong inter-correlations and, therefore, indicate one dimension. The results of the assessment support tested hypothesis.

Structural Equation Modelling was used as a part of the CSF assessment system. The maturity levels structure was verified by the Cluster Analysis

The proposed comprehensive CRM Maturity Model appears to be a very useful instrument for managers in determining current status of Critical Success Factors, maturity level and further development steps of the CRM strategy in the organization.

References

1. Kharisov M. "Comprehensive Maturity Model Development for Customer Relationship Management". In: *Proc. of the 18th Interuniversitären Doktorandenseminars*, 2014, pp. 61-71.

2. Kim, J., Suh, E., Hwang, H. "A Model for Evaluating the Effectiveness of CRM Using the Balanced Scorecard". *Journal of Interactive Marketing*. 2003; 5-19.

3. Radcliffe, J. "Eight building blocks of CRM: A framework for success". Gartner. 2001.

4. Dawn, J., Craig, J., Bodorik, P. "Enabling and measuring electronic customer relationship management readiness". In: *Proc. of the 34th Annual Hawaii International Conference on System Sciences*, 2001, pp. 1-10.

5. Stone, M., Woodcock, N., Wilson, M. "Managing the change from marketing planning to customer relationship management". *Long Range Planning*. 1996; 29:675-683.

6. Batenburg, R., Versendaal, J. "Business/IT-alignment for Customer Relationship Management: Framework and Case Studies". *Int. J. Electronic Customer Relationship Management.* 2007; 1.3:258-268.

7. Sohrabi, B., Haghighi, M., Khanlari, A. "Customer Relationship Management Maturity Model (CRM3): A Model for Stepwise Implementation". *International Journal of Human Sciences*. 2010; 1-20.

8. Rigby, D. K., Reichheld, F. F., Schefter, P. "Avoid the four perils of CRM". *Harvard Business Review*.2002; 80.2:101-109.

9. Gamm, S., Grümer, R., Müller, H., et al. "Telco CRM Maturity: The Evolution and Maturity of CRM at Telcos in Central & Eastern-Europe". 2005.

10. Leidecker, J. K., Bruno, A. V. "Identifying and Using Critical Success Factors". *Long Range Planning*. 1984; 17.1:23-32.

11. Paulk, M. C., Curtis, B., Chrissis, M. B., et al. "The Capability Maturity Model for Software". Carnegie Mellon University. 1993.

12. Saunders, M., Lewis, P., Thornhill, A. "Research Methods for Business Students Fifth edition". Pearson Education Limited, 2009.

13. Webster, J., Watson, R. T. (2002). "Analyzing the Past to Prepare for the Future: Writing a Literature Review". *MIS Quarterly*. 2009; 26.2:xiii-xxiii.

14. Romano, N. C. "Customer Relations Management Research: An Assessment of Sub Field Development and Maturity". In: *Proc. of the 34th Hawaii International Conference on System Sciences*, 2001, pp. 1-10.

15. Hevner, A. R., March, S. T., Park, J., et al. "Design Science in Information Systems Research". *MIS Quarterly*. 2004; 28.1:75-105.

16. Becker, J., Knackstedt, R., Pöppelbuß, J. "Developing Maturity Models for IT Management – A Procedure Model and its Application". *Business & Information Systems Engineering*. 2009; 1.3:213-222.

17. Boulding, W., Staelin, R., Ehret, M., et al. "A Customer Relationship Management Roadmap: What Is Known, Potential Pitfalls, and Where to Go". *Journal of Marketing*. 2005; 69:155-166.

18. Batenburg, R., Versendaal, J. "Business alignment in the CRM Domain: Predicting CRM performance". In: *Proc. of the ECIS*, 2004, pp. 1-12.

19. Wendler, R. "Development of the Organizational Agility Maturity Model". In: *Proc. of the 2014 Federated Conference on Computer Science and Information Systems, 2014*, pp. 1197-1206.

20. Krishna, K., Narasimha Murty, N. "Genetic K-means algorithm". *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)*. 1999; 29.3:433-439.