

## **Determinants of Performance in Customer Relationship Management – Assessing the Technology Usage – Performance Link**

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### **Abstract**

*The management of customer relationships has become a top priority for companies in the last years. Despite this, little is known about the factors of successful CRM implementations and the role of information technology in this context. This study provides three models for the explanation of CRM performance separated according to the customer lifecycle phases initiation, maintenance, and retention. We analyze the relationship between CRM technology, CRM technology usage and CRM performance. In addition, we identify the drivers that affect implementation success for each phase the most.*

### **1. Purpose of the research**

In recent years, the management of customer relationships has become a top priority for companies. Although there has been much discussion concerning implementation challenges and the advantages of CRM technology, little empirical evidence of the factors that affect economic performance has emerged ([29]). For example, Reinartz et al. find a positive link between a set of CRM activities and economic performance ([34]). Reinartz et al. find a positive, moderating effect of CRM technology, which indicates that technology plays a role in the successful implementation of CRM ([34]). But only a few studies have uncovered the factors that influence the use of CRM technology (e.g. [2]). Additionally, research is needed to understand whether and how CRM technology capabilities provide a factor for success in CRM.

Thus, the goal of the current study is twofold: (1) to conceptualize and operationalize the aspects that are related to CRM technology and impact performance across the phases of the customer lifecycle, and (2) to determine whether and how strong those factors together with the other relevant factors of a CRM im-

plementation are positively linked to the respective CRM performance per phase.

Section 2 discusses the theoretical background. Section 3 describes the research objective and the model. Data collection and research method are discussed in Section 4. Section 5 presents the empirical results of the study. Finally, managerial implications are highlighted in section 7. The article concludes with implications for future research in section 8.

### **2. Theoretical background**

CRM is theoretically based on the relationship marketing concept. Common to all theoretical approaches is that the management of relationship is valuable for the company ([27]; [45]). In addition, relationships evolve over distinct phases that are related to the customer lifecycle ([13]). Firms that build relationships over time should interact with customers and manage relationships differently at each phase ([42]). Thus, CRM should focus on a systematically lifecycle-congruent management of activities to develop customer relationship across the customer lifecycle with the most profitable customers. In order to achieve this goal, the organizational design, the management culture and orientation and the usage of information technology must be aligned.

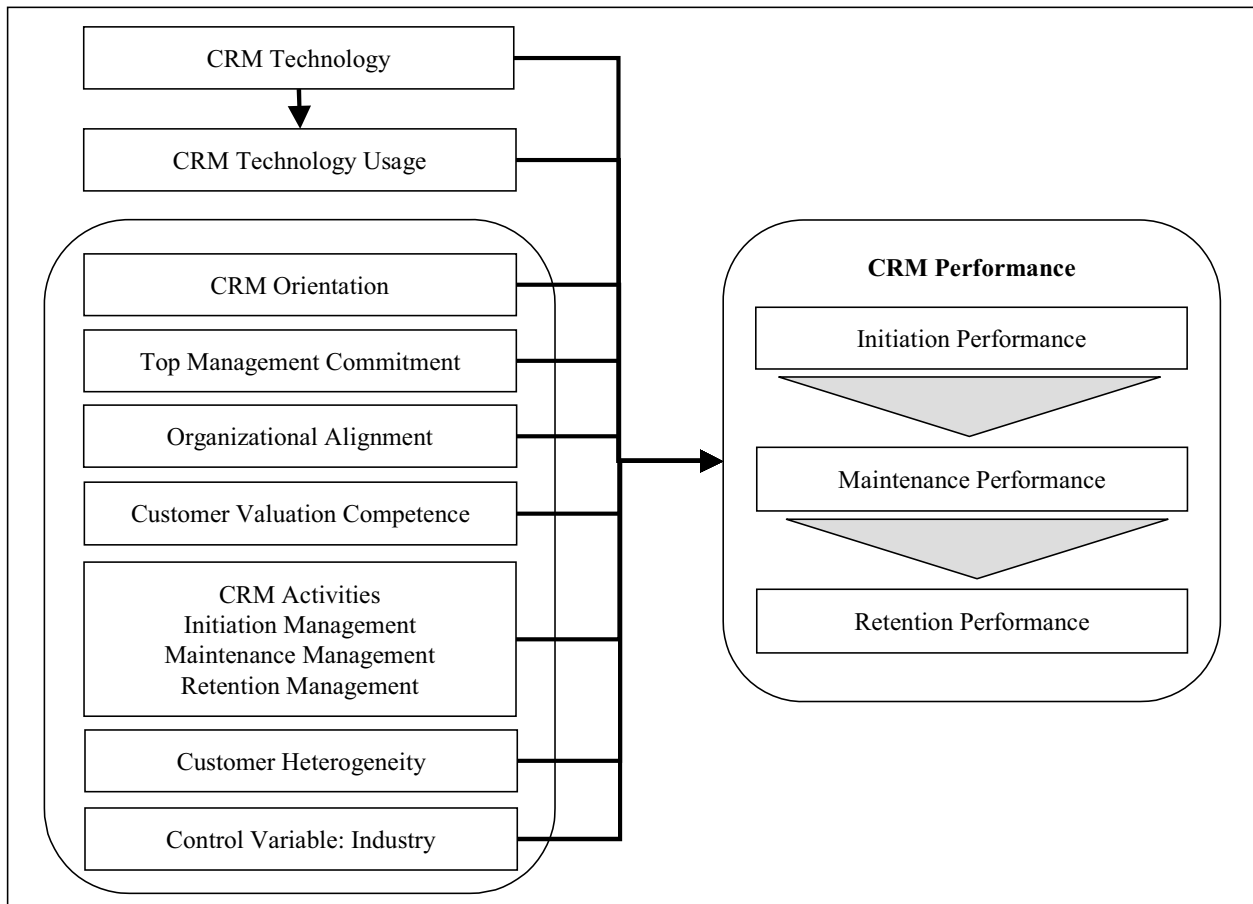
As a result of this, we define CRM as a cross-functional process that focuses on initiating, maintaining, and retaining long-term relationships to achieve a better economic performance. CRM is carried out across the customer lifecycle with the help of information technology ([8]; [34]).

### 3. Research objective and structural model

According to [13] we assume that customer relationships evolve over distinct phases that exhibit differences in behaviors and orientations and therefore have to be served by different CRM activities. We identify three customer lifecycle phases: “Initiation”, “Maintenance” and “Retention”. Following our research goal, we construct three models for the three lifecycle phases. Model 1 examines what drives performance outcomes of CRM in the lifecycle phase “Initiation”, model 2 analyzes the factors impacting performance outcomes of CRM in the phase “Mainte-

([4]; [47]). This incorporates the acquisition, storage, dissemination and usage of customer information ([40]; [41]) for the purpose of initiating, maintaining and retaining better customer relationships. Empirical results regarding the performance impact of technology at the firm level are mostly positive (e.g. [18]; [25]).

Less attention has been paid to the degree of usage of information technology in the context of CRM ([20]). Technology usage is regarded a key driver of organizational success ([11]; [23]). Albeit, studies have mostly focused on the acceptance of technology in CRM as given by the intention to use technology ([2]). In our conceptualization we measure the degree of usage by an independent variable that uses an ob-



**Figure 1. Overview of the research model**

nance”, and in model 3 the performance outcomes of CRM in the final phase “Retention” depending on appropriate activities are investigated. The outcomes of the three models are measured by appropriate performance measures. The indicators of which the constructs are comprised can be seen in table 2 and 3.

As a major part of a CRM implementation, literature suggests a set of capabilities related to CRM Technology ([7]) for gaining customer understanding

jective measure (e.g. CRM system usage) ([9], [11]; [44]) The usage of CRM Technology results in performance impacts only when the CRM system is suitable for the assumed task in the respective lifecycle phase ([15]). In addition to this, research of user acceptance of mandated technology suggests that often users are forced to use a specific technology ([5]). For CRM, we assume that users can voluntary vary the extent of CRM Technology Usage in combination

with the execution of the different CRM activities. In our research we assume that the nature of CRM Technology together with CRM Technology Usage enable firms to obtain performance gains. Instead of only measuring the direct effects of CRM Technology on the respective performance measures, we assume that the configuration of CRM Technology positively influences CRM Technology Usage.

As firms should interact with their customers and manage relationships differently at each phase ([42]), every phase is managed with the help of distinct CRM activities. Thus, we identified different CRM activities for the Initiation Management, Maintenance Management and Retention Management according to the three lifecycle phases. In addition to the different activities for the phases, we assume that there exist some factors that are important for a successful implementation of CRM. Since it is recognized that the distribution of relationship value to the company is heterogeneous ([28]; [31]), Customer Valuation Competence, measured by the extent of deployment of sophisticated customer lifetime value approaches, may be a key factor in a CRM system. In addition, for the CRM implementation it is of importance to align the organization to the CRM processes, e.g. develop appropriate Organizational Alignment and compensation schemes ([26]). Past studies have emphasized the importance of Top Management Commitment for the CRM implementation ([19]) as well as a CRM Orientation ([30]). Customer Heterogeneity plays a significant role in the successful implementation of CRM ([31]). To control for heterogeneity in the sample we included a Control Variable for the financial services industry in the analysis as we assume that this industry shows significantly higher impacts on CRM performance than other industries.

Figure 1 illustrates the structure of our research model, the factors of a CRM implementation that affect CRM performance per phase of the customer lifecycle, based on relevant theory and translated into empirically testable hypotheses.

#### 4. Data collection and research method

The data used in this study are unique in so far that they come from actual CRM implementations of the consulting company Accenture. Data was collected from June to October 2002 in 10 European countries. The questionnaire, after pre-testing, was addressed to CRM project managers or to the Top Management of the clients of Accenture. One month after the initial mailing of the survey, follow-up reminders were sent via email. 400 companies from the database of Accenture were randomly selected. Altogether a total of 90

usable questionnaires were received, giving a satisfying response rate of 22.5%. The companies are mainly large companies from different industries in the business-to-consumer sector with more than 1.000 employees.

Since we have several constructs, each of them operationalized through several indicators, structural equation modeling is the appropriate method for analysis. Instead of relying on the “Cronbach’s  $\alpha$  -LISREL”-paradigm ([3]; [43]) we applied Partial Least Squares (PLS) because of its ability (1) to model constructs under conditions of non-normality and small to medium sample sizes, and (2) to work with indicators that are formative as well as reflective. Reflective indicators all measure the same underlying phenomenon, reflecting the construct. Formative measures are different facets of an underlying construct and may not be correlated. Rather, they cause the construct ([12]; [38]). The relative importance of each indicator of a construct is measured by weights ([6]). The reliability of constructs with reflective indicators is assessed with the help of a confirmatory factor analysis and Cronbach’s alpha (each factor exceeds 0.7). For constructs with formative indicators we have to make sure that we have captured all important facets. However, multicollinearity may be present among the indicators. Therefore, we checked for correlations of the indicators and tested for multicollinearity by computing variance inflation factors (VIF) and the condition index for the equation of the endogenous construct. Highly correlated indicators were merged to an index. Then, the resulting condition indices for the various structural equations were all less than 30 indicating acceptable multicollinearity ([17]).

In testing the three lifecycle models, direct effects on CRM performance in the respective phase were modeled except for the interrelationship between CRM Technology and CRM Technology Usage, where an indirect relationship is assumed. For every single model we employed a bootstrapping method (500 times) that used randomly selected subsamples to test the PLS models ([6]; [14]).

We used a five-point Likert scale (1 = do not agree at all to 5 = fully agree) to measure the indicators of the model. CRM Technology Usage is measured as percentage of the actual CRM system usage. This procedure is in accordance with previous research in the field of information technology usage ([10]; [11]). The performance measures of the CRM performance constructs were measured directly as improvement percentages since CRM was implemented. We measure CRM performance at the “Initiation” phase as the percentage by which customer acquisition and customer recovery had been improved ([35]). CRM performance at the “Maintenance” phase is measured as

percentage of improvement of cross-/up-selling activities, customer satisfaction and share of wallet ([36]). Finally, CRM performance at the “Retention” phase is measured as percentage of improvement of customer retention and lowering of customer defection ([33]; [39]).

### 5. Major results

The major results for the models of the three lifecycle phases are listed in table 1 (structural models) and table 2 (measurement models for constructs with reflective indicators) and table 3 (measurement models for constructs with formative indicators). All three lifecycle models fit the data well with a corrected R<sup>2</sup>

for the three phases of 32.8% for “Initiation Performance”, 32.8% for “Maintenance Performance”, and 26.2% for “Retention Performance”.

As shown in table 1, the PLS analysis provides substantial support for most of the hypothesized impacts on the performance of the three lifecycle phases. The hypothesized positive associations for CRM Technology Usage on performance were supported for all three lifecycle models. These findings are congruent to the findings of [20] and [11]. Contrary to [34] our findings indicate that CRM Technology itself has no significant direct impact on performance but a highly significant indirect impact on performance via CRM Technology Usage. This fact highlights the assumption that the more comprehensive the CRM Technology, the higher the CRM Tech-

**Table 1. Results of the structural models for the three lifecycle phases**

Latent endogeneous variable	Latent exogeneous variable	Hypotheses	Coefficient	T-values	R <sup>2</sup> <sub>corr</sub>
<b>Initiation Performance</b>	CRM Technology	+	0.063	0.496	<b>0.328</b>
	CRM Technology Usage	+	0.310	2.692***	
	Initiation Management	+	0.277	2.511***	
	Customer Valuation Competence	+	0.213	2.088**	
	Organizational Alignment	+	0.218	1.975**	
	Top Management Commitment	+	0.035	0.404	
	CRM Orientation	+	-0.222	-2.056**	
	Customer Heterogeneity	+	0.211	2.217**	
	Control Variable	+	0.303	2.995***	
CRM Technology Usage	CRM Technology	+	0.469	4.698***	0.210
<b>Maintenance Performance</b>	CRM Technology	+	0.146	1.494*	<b>0.328</b>
	CRM Technology Usage	+	0.224	2.362**	
	Maintenance Management	+	0.213	2.249**	
	Customer Valuation Competence	+	0.349	3.305***	
	Organizational Alignment	+	0.181	1.782**	
	Top Management Commitment	+	0.056	0.816	
	CRM Orientation	+	0.119	1.313*	
	Customer Heterogeneity	+	0.371	4.444***	
	Control Variable	+	0.233	2.821***	
CRM Technology Usage	CRM Technology	+	0.430	5.729***	0.175
<b>Retention Performance</b>	CRM Technology	+	0.140	1.089	<b>0.262</b>
	CRM Technology Usage	+	0.214	2.074**	
	Retention Management	+	0.345	3.829***	
	Customer Valuation Competence	+	0.166	2.087**	
	Organizational Alignment	+	0.188	1.805**	
	Top Management Commitment	+	0.232	2.881***	
	CRM Orientation	+	0.222	2.338**	
	Customer Heterogeneity	+	0.258	2.577***	
	Control Variable	+	0.061	0.768	
CRM Technology Usage	CRM Technology	+	0.406	4.549***	0.155

\* significant at p<0.1; \*\* significant at p<0.05; \*\*\* significant at p<0.01

nology Usage.

Aside from CRM Technology and CRM Technology Usage, other factors may influence a successful CRM implementation: The CRM activities necessary to carry out a successful Initiation Management, Maintenance Management and Retention Management exhibit a significant impact on performance. Additionally, Organizational Alignment shows continuous significant impacts across the lifecycle phases. Customer Valuation Competence also dis-

Table 2 reports the major results for the measurement models of the CRM activities directed to the phase specific achievements for the constructs with reflective indicators. Table 3 shows the results for the constructs with formative indicators. Overall, most of the indicators of the measurement models show significant loadings (reflective) or weights (formative). All items were developed based on items from existing empirical studies, CRM literature, and input from CRM experts.

**Table 2. Results of the measurement models for constructs with reflective indicators**

Reflective Variables	Initiation		Maintenance		Retention	
	Loadings	T-values	Loadings	T-values	Loadings	T-values
<b>CRM Technology Usage</b>						
CRM system usage	0.911	15.046***	0.891	18.056***	0.898	21.752***
Support through CRM system	0.939	35.556***	0.954	58.862***	0.949	44.216***
<b>Top Management Commitment</b>						
Emphasis of customer orientation	0.716	3.351***	0.160	0.636	0.610	2.869***
Employee motivation	0.881	4.337***	0.736	3.250***	0.890	4.494***
Involved in CRM implementation	0.811	3.695***	0.922	3.727***	0.853	4.000***
Communication of CRM vision	0.928	4.602***	0.786	3.381***	0.939	4.540***
<b>CRM Orientation</b>						
CRM as a part of the firms strategy	0.847	3.573***	0.879	3.062***	0.701	2.677***
Satisfaction of customer needs	0.807	3.521***	0.039	0.141	0.810	2.887***
Customer knowledge competence	0.560	2.536***	0.518	1.967**	0.042	0.148

\* significant at p<0.1; \*\* significant at p<0.05; \*\*\* significant at p<0.01

plays a continuous impact according to literature ([46]). In the lifecycle phase Maintenance the construct shows a higher path coefficient than in the other phases which can be caused by the need to analyze the value of a customer in order to successfully cross-sell products. Notably,

Top Management Commitment and Customer Orientation only account for significant positive impacts in the last phase of the customer lifecycle which is somewhat contradictory to past research ([7]; [16]). In accordance to the findings of [8], customer heterogeneity exhibits a continuous strong impact on performance, because it increases the benefits of a focused customer targeting according to the lifecycle phases. Finally, the control variable for the industry financial services presents a significant impact in the phases "Initiation" and "Maintenance", indicating that the financial services industry performs significantly better in those phases of the lifecycle than the other industries studied. We agree with this result as the financial services industry is more successful in cross-selling activities because of the comprehensive knowledge about the customer in this industry.

For the construct CRM Technology Usage it is shown that the reflective indicators display highly significant loadings, resulting in a Cronbach's Alpha of 0.829. Interestingly, the reflective indicator "customer knowledge competence" shows low loadings in all phases. For CRM Technology our findings indicate significant weights for the ability to collect and store customer data through the sales channels, a "uniform customer database", "regular updating of customer data" and the possibility of "data access through marketing, service and sales" ([24]). It should be noted that the distribution of significant weights differs over the phases of the lifecycle. For example, it can be shown, that the "updating of customer data" becomes more important in the phase "Retention", whereas the data access through the various departments is only significant in the first two phases. For the Top Management Commitment and the CRM Orientation table 3 reports mostly highly significant loadings resulting in values above 0.7 for Cronbachs Alpha. Therefore, a modification of the constructs was not necessary.

**Table 3. Results of the measurement models for constructs with formative indicators**

Formative Variables	Initiation		Maintenance		Retention	
	Weights	T-values	Weights	T-values	Weights	T-values
<b>CRM Technology</b>						
Collection of data through sales channels	0.237	1.243	0.478	2.242**	0.537	2.372**
Closed information loops	0.341	1.438	0.199	0.940	0.313	1.509*
Uniform customer database	0.329	1.856**	0.336	1.785**	0.370	1.914**
Regular updating of customer data	0.184	1.005	0.315	1.411*	0.375	1.736**
Continuous collection of customer data	0.356	2.108**	0.282	1.655*	0.412	2.196**
Collection of customer data	-0.072	-0.407	0.101	0.730	0.015	0.113
Collection of customer reaction data	-0.079	-0.470	-0.165	-0.878	-0.305	-1.396*
Use of external research information	0.005	0.035	-0.090	-0.644	-0.123	-0.889
Data access through marketing, service and sales	0.434	2.067**	0.332	1.516*	0.190	0.965
<b>Initiation Management</b>						
Personalized communication	0.507	2.041**				
Avoidance of unprofitable relationships	0.410	1.768**				
Multi-channel management	0.405	1.426*				
Customer recovery management	0.914	3.231***				
<b>Maintenance Management</b>						
Personalized communication			-0.219	-0.688		
Service and rebates			-0.399	-1.351*		
Cross-/up-selling activities			1.058	3.289***		
<b>Retention Management</b>						
Analysis of customer behavior					0.962	3.839***
Personalized communication					-0.135	-0.712
Consistent interaction across channels					0.079	0.492
Customer retention strategy					0.092	0.494
Customer retention programs					0.181	1.112
Avoidance of unprofitable relationships					-0.196	-0.837
Active termination of relationships					0.483	2.051**
Passive termination of relationships					-0.172	-1.083
<b>Organizational Alignment</b>						
Segment-oriented organizational structure	0.273	1.356*	0.520	2.250**	0.031	0.163
Reorganization of competences	0.315	1.116	0.564	1.962**	0.725	2.494***
Cooperation between marketing, service and sales	-0.850	-3.117***	-0.492	-1.535*	-0.451	-1.673**
Incentive system	0.745	3.041***	0.358	1.240	0.218	0.818
Customer-based employee rating	-0.106	-0.571	-0.638	-2.217**	0.128	0.500
Assignment of CRM training	-0.106	-0.560	0.295	1.179	0.448	1.643**
<b>Customer Heterogeneity</b>						
Socio-demographic factors	0.861	3.096***	0.941	6.416***	0.744	3.170***
Product preferences	-0.082	-0.381	0.042	0.250	-0.360	-1.460*
Price/performance expectations	0.067	0.259	-0.218	-1.114	0.063	0.262
Loyalty	0.040	0.181	0.394	1.851**	0.651	2.840***
Service demands	-0.658	-2.546***	-0.087	-0.526	-0.135	-0.521

\* significant at p<0.1; \*\* significant at p<0.05; \*\*\* significant at p<0.01

“Initiation Management” is mostly characterized according to the weights by “customer recovery management”, then by “personalized communication”, “avoidance of unprofitable relationships” ([28]; [31]) and “multi-channel management” ([32]). Maintenance Management is characterized by “cross-/ up-selling activities” according to [21]. Interestingly, “personalized communications” does not show a significant weight on the construct and “service and rebates” even display a negative weight on the 0.1 level. This outcome supports the conceptualization of [48], who remarks that increased service and rebates may have a negative impact on financial outcomes. Retention Management is described by the “analysis of customer behavior” and the “active termination of relationships” while the other indicators show no significant weights. Interestingly, the “implementation of customer retention programs” does not display a significant weight. However, the “active termination of relationships” with unprofitable customers rather than the “passive termination of relationships” by e.g. decreasing service exhibits a significant weight. This result supports the conceptualizations of [1] and [22].

our research supposes that the “cooperation between marketing, services and sales” has a negative impact on performance over the customer lifecycle. For Customer Heterogeneity our findings show that most customers are different according to their socio-demographic factors across the whole customer lifecycle. Regarding loyalty customers are more different in the last two phases of the lifecycle. Surprisingly, customers are more equal regarding service demands in the first phase of the customer lifecycle.

### 6. Discussion

The findings indicate that there exist factors that have an impact on performance across the whole lifecycle and factors that only show an effect in specific lifecycle phases.

Table 4 exhibits the determinants of CRM performance divided into classes of three different levels of path coefficients. This table reveals that the factors CRM Technology and CRM Technology Usage show path coefficients greater than 0.2 for the first phase and medium path coefficients for the later phases.

**Table 4. Overview of determinants of CRM performance**

<b>Path Coefficients</b>	<b>Initiation</b>	<b>Maintenance</b>	<b>Retention</b>
> 0.25	Initiation Management Industry <b>CRM Technology Usage</b>	Customer Valuation Competence Customer Heterogeneity	Retention Management Customer Heterogeneity
0.2 < x < 0.25	<b>CRM Technology*</b> Customer Valuation Competence Organizational Alignment CRM Orientation Customer Heterogeneity	<b>CRM Technology*</b> <b>CRM Technology Usage</b> Maintenance Management Industry	<b>CRM Technology *</b> <b>CRM Technology Usage</b> Top Management Commitment CRM Orientation
< 0.2	Top Management Commitment	Organizational Alignment Top Management Commitment CRM Orientation	Customer Valuation Competence Organizational Alignment Industry

\* Direct and indirect effects.  
Path coefficients in absolute values.

The construct Organizational Alignment is characterized by the “reorganization of competences“ in all phases of the lifecycle, whereas an “incentive system” shows only a significant weight in the phase “Initiation”. In contrast to literature, “customer-based employee rating” displays even a negative weight in the “Maintenance” phase, which can be explained by the fact that customer satisfaction does not necessarily lead to a higher share of wallet ([21]). Interestingly,

CRM Technology shows a continuous medium impact across the whole customer lifecycle as a result of the indirect effect on CRM Technology Usage. Thus, the analysis clearly demonstrates that it is of importance not only to implement a sophisticated CRM Technology for the acquisition, storage, dissemination and use of customer information but to ensure that the Technology is appropriately used. This result is consistent with literature ([20]; [34]). The highly signifi-

cant path coefficients between CRM Technology and CRM Technology Usage indicate that a highly sophisticated CRM Technology supports its usage which leads to higher performance in the phases of the customer lifecycle. In addition, our findings indicate that CRM Technology and CRM Technology Usage are not a panacea to CRM problems ([37]). Our analysis also suggests that besides the technology factors Organizational Alignment, Customer Valuation Competence and the lifecycle-congruent implementation of CRM Activities influence performance. Thus, the successful implementation of organizational change and CRM routines and capabilities is substantial for CRM success as the condition of customer heterogeneity is. Based on the findings from this study we have shown that the Top Management Commitment and CRM Orientation only show significant impacts in the phase "Retention" which stands in contrast to previous findings of Top Management Commitment in the area of information technology implementation ([19]). These results might suggest that CRM today still concentrates on customer retention instead of facilitating CRM across the whole customer lifecycle.

## 7. Managerial Implications

The results of this study provide general support for the proposition that the more comprehensive the CRM Technology, the higher the CRM Technology Usage, and the better the CRM performance across the phases of the customer lifecycle.

Several managerial implications follow from the results of this study. First, recent studies have simply focused on the implementation of CRM Technology itself, reporting only limited impact of technology on CRM performance ([34]). Our research has identified CRM Technology Usage as one of the key performance drivers. The particular lesson from this research concerning CRM Technology and CRM Technology Usage is that CRM Technology itself only has limited impact on performance. Performance impacts can only be obtained in connection with CRM Technology Usage. Managers should also consider to concentrate the CRM implementation on specific CRM activities according to the phase of the customer lifecycle to interact with the customer. To support those activities, organizational alignment and customer valuation competence should be regarded as important determinants. Less attention should be focused on the Top Management Commitment and CRM Orientation in the early phases. Finally, CRM requires customer heterogeneity, otherwise the personalized communication and treatment of customer is of limited success ([8]). The operationalization of the constructs

with formative indicators offers the possibility to identify drivers that decision makers can incorporate in their CRM implementation.

## 8. Limitations and implications for future research

The first objective of this research was to conceptualize and operationalize the elements needed for a CRM implementation, differentiated across the phases of the customer lifecycle. This objective was achieved by three distinct models of CRM performance in the lifecycle phases. The second objective of this research was to explore which factors of a CRM implementation are positively linked to the respective CRM performance per phase. Although this work must be considered exploratory, the results provide further support for the link between CRM Technology, CRM Technology Usage and performance. We present the degree of usage of information technology in the context of CRM which is new to previous research. The findings that CRM Technology only creates value in cooperation with a high degree of CRM Technology Usage is counter to the claims that efforts must only be put in the implementation of information technology rather than in the intensive usage of it. In fact, the consistent usage of CRM Technology has a strong impact on the performance of all customer lifecycle phases. Future research should focus on what constitutes CRM Technology Usage.

Some limitations should be kept in mind with regard to this research. First, with only 90 observations, additional empirical research is needed to support the findings presented in this paper and to test the generalizability. Second, as the study incorporates several industries, further research should focus on specific industries to refine measures and scales and to determine the differences between our findings and the ones at the company or industry level. Third, it should be kept in mind that the implementation of CRM across the customer lifecycle is a dynamic process that we only have captured at a single point of time. Future research should focus on analyzing CRM from a longitudinal perspective rather than from a cross-sectional perspective.

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