

# A RESEARCH MODEL OF CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS FOR MOBILE DEVICES

## *Description of a Research Model about Customer Relationship Management Projects*

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**Abstract:** In literature we can find evidence about a high number of failed CRM projects. However concerning CRM projects in combination with the implementation of mobile devices for field staff in sales and services there aren't many results published. So there are missing information about the success of such projects, the success factors and the objectives. This paper presents a research model about such CRM projects. A CRM project in this paper is defined as an implementation of a CRM system together with mobile devices. The research model will give further insight into the success factors of such projects and the achieved objectives.

## 1 INTRODUCTION

Several studies (e. g. Alt 2004; Thomson et. al 2002; Ryals 2000) document the failure of CRM projects in the past. But concerning CRM projects related with the implementation of mobile devices for field staff in sales and services we find nearly no information so we can make no statement about how many of these projects failed. To gain more information about this and to prevent such CRM projects from failing it seems reasonable to inspect such projects. Therefore it is important to know what are the success factors and the achieved objectives of such projects. For this reason a research model will be given in this paper. The research model focuses on companies which sell their products and services to other companies – this is the so called business to business (B2B) sector. The B2B sector is more appropriate because in this sector we find a higher number of field staff working with mobile devices in combination with a CRM solutions than in the B2C sector.

For a better understanding there will be given some definitions. Customer Relationship Management (CRM) is a customer oriented strategy which is supported by information technology (IT) (Hippner 2004). CRM “[...] is the infrastructure that enables the delineation of and increase in customer value,

and the correct means by which to motivate valuable customers to remain loyal – indeed, to buy again” (Dyché 2002, p. 4).

The information technology respective the CRM systems help to enhance the customer relation and to standardise the CRM activities and processes in fields of marketing, sales and service. This paper is focussing on CRM systems integrating actors using mobile devices. In terms of our research mobile devices are mobile handheld devices like cellular phones, personal digital assistants (PDA) and Smartphones but also on-board vehicle computers or notebooks.

A CRM project is a project which includes the implementation of a CRM system together with mobile devices but also the adoption of a customer oriented strategy. A project is a timely restricted endeavour to archive stated objectives; it has an assigned budget.

CRM systems together with mobile devices expand the channels of CRM to the customer (Sundararajan 2002) and assist both actors of CRM – employees of the suppliers and of the customers using mobile devices via public and private communication networks. Because the employees of the supplier (e. g. field manager gets mobile access to customer information) and/or of the customer (e. g. customer receives flight information on his cellular phone) can be in the working state mobile or

stationary we can differentiate between four CRM scenarios like shown in Figure 1 (Hampe 2002). In the mobile state the mobile actor is not located within its homelike infrastructure. The research model will enclose the three scenarios “classical CRM system”, “field staff” and “mobile link”. The scenario “mobile services” covers other aspects of CRM like mobile marketing and needs therefore other IT infrastructure.

		<i>Customer</i>	
		<i>stationary</i>	<i>mobile</i>
<i>Supplier</i>	<i>Working state of an employee</i>		
	<i>stationary</i>	Classical CRM system	Mobile Services
	<i>mobile</i>	Field staff	Mobile Link

Figure 1: CRM scenarios using mobile devices.

## 2 LITERATURE REVIEW

Up to now, little research has been conducted in this described field of research (Salomann et al. 2005). To get a better overview about the research that has already been done, they will be grouped by the following aspects:

- Author and year
- Objective, research item and research focus business to business or business to customer sector
- Method of data analysis
- Database (sample size, kind of questioning, kind of investigation and countries in which the enterprises of the study are)
- Success factors of the CRM project
- Achieved objectives

The success factors are grouped by:

- CRM as strategy
- Implementation of CRM system
- Implementation of mobile information technology (mobile IT)

Also the achieved objectives of the CRM projects are sub-classified after the following aspects:

- related to the enterprise
- containing information about the objectives of the field staff

The last point is important because this information gives more insights about the result of an implementation of mobile devices. The last column in Table 1 shows if the research about the relationship between the success factors and the objectives is part of the study. This aspect is described with “connection between the variables”. All studies concerning this research topic are listed in Table 1.

As can be seen in Table 1 there is no study which covers all listed aspects. Most of the studies focus on the sector of B2C or B2B and B2C. There is only one study that focuses only on B2B. No study covers the aspect of mobile information technology and the achieved objectives in field staff. Some studies are influenced by a company which delivered the CRM systems or which did the consulting during the CRM projects.

According to the described research gaps there is a need of more research concerning mobile information technology in combination with CRM systems and CRM strategy. It is also necessary to analyse the objectives which are achieved by implementing CRM systems together with mobile devices by looking at the field staff. Therefore a conceptual development will be given and a research model will be presented.

## 3 CONCEPTUAL DEVELOPMENT

In the next paragraphs the research model in Figure 2 will be explained. The ellipses represent latent variables; these are the constructs of the model. The relationships between the variables are shown by the arrows between the ellipses. Each arrow is marked with ‘H’ and a number, which stands for the number of the hypothesis. The whole model contains 20 hypotheses. As shown in Figure 2 the success factors are on the left side and the objectives on the right side of the figure. According to Table 1 the success factors are divided into “CRM as strategy” and “implementation of CRM together with mobile IT”. The objectives are categorized into three groups: The first group is the over all satisfaction with the CRM project. The remaining groups are the objectives achieved in the whole enterprise. They are measured in four dimensions. The objectives referring to the field staff and the use of mobile devices are measured in three variables, also called dimensions.

Table 1: Selected studies on CRM systems.

Author and year	objective, research item and research focus business to business (B2B) or business to customer (B2C)	method of data analysis	database - Sample size - Kind of questioning - Kind of investigation - Country in which the survey did take place	success factors			achieved objectives		Connections between variables
				CRM as strategy	CRM system	Mobile information technology	enterprise	field staff	
Alt, Pushmann, Österle 2004	- Success factors of CRM projects - Research item: enterprises - B2C	Explorative analysis and benchmarking	- N = 6 - Personal interviews - Half standardized questionnaire - Countries: Germany, Switzerland, USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Day, Van den Bulte 2002	- Positional advantages and relative performance through customer relating capability and competitive strategy - Research item: middle and big enterprises - B2B and B2C	Qualitative analysis, factor analysis	- N = 299 - Written and online questioning - Standardized questionnaire - Country: USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Greve 2006	- Success factors of the implementation of CRM systems - Research item: enterprises which are consulted by the company Accenture - B2C	Qualitative analysis, descriptive statistics, PLS analysis	- N = 90 - Written questioning - Standardized questionnaire - Countries: Europe, mostly Germany	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Jayachandran et al. 2004	- Influence of the CRM information process and the use of CRM technology to the customer relationship performance - Research item: enterprises - B2B and B2C	Qualitative analysis, factor analysis	- N = 172 - Written and online questioning - Standardized questionnaire - Country: no information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Reinartz, Krafft, Hoyer 2003	- Success factors and objectives of CRM implementations - Research item: enterprises - B2C	Qualitative analysis, descriptive statistics, PLS analysis	- N = 211 and N = 95 - Written and online questioning - Standardized questionnaire - Countries: Germany, Austria, Switzerland	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Selchert 2005	- Measurement of success of CRM projects in companies which have chosen CRM systems of SAG AG - Research item: enterprises - B2B and B2C	Descriptive statistics, Key performance indicators	- N = 32 - Telephone interviews - Standardized questionnaire - Countries: Germany, Austria, Switzerland	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
Wilson et al. 2002	- Success factors in CRM - Research item: enterprises - B2B and B2C	Explorative analysis	- N = 5 - Personal interviews - Half standardized questionnaire - Country: no information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Zahay, Griffin 2002	- Investigation about the customer based performance and the business growth - Research item: enterprises - B2B	Quantitative analysis, descriptive statistics, factor analysis	- N = 206 - Telephone interview - Standardized questionnaire - Countries: USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

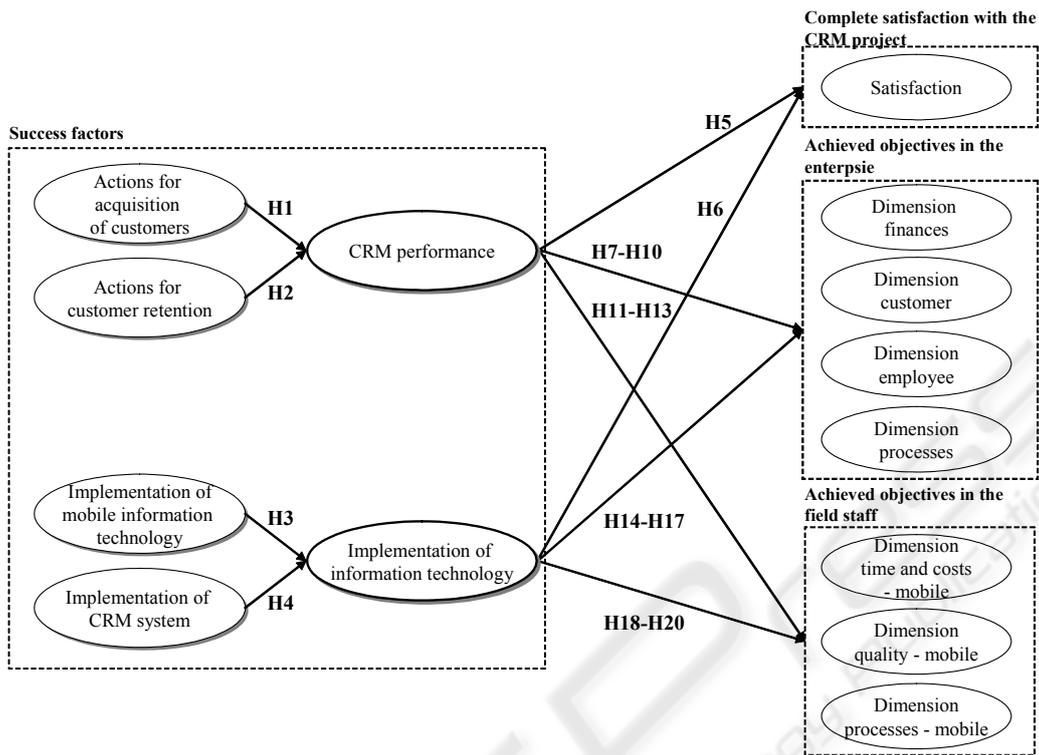


Figure 2: Research model.

### 3.1 Success Factor CRM Performance

The variable CRM performance stands for the ability of an enterprise to adapt the CRM strategy in its enterprise strategy and the CRM concepts and activities in its marketing, sales and service concepts. To measure the CRM performance three constructs are needed. Some aspects of these constructs are transferred from the study of Reinartz 2004. But the constructs of this study have to be converted from the B2C sector to special aspects of the B2B sector. Therefore the consciously determination of a customer relationship is not part of this model (Rapp 2000). So we get two antecedents for CRM performance.

First there are the actions to acquire new customers and second there are the actions to force the relationship to profitable customers and also to recommit inactive profitable customers (Reinartz 2004).

The actions to acquire new profitable customers and to build a relationship to the already profitable customers have an influence on the CRM performance of an enterprise (hypotheses 1 and 2).

### 3.2 Success Factor Implementation of Information Technology

The variable implementation of information technology stands for the support of all customers related and oriented activities by IT. Especially in CRM are many activities, which wouldn't be possible in an efficient way without IT – e. g. personalized advertising and newsletters. Therefore you find already in the definition of CRM the importance of IT (Hippner 2004).

To get an IT that covers all aspects of CRM there is a combination of the implementation of mobile IT and of a CRM system necessary. Therefore the variable implementation of information technology has two antecedents.

Only if the mobile technology and all other channels to the customer are integrated into the CRM system to ensure a bidirectional data flow on a consolidated customer data base all CRM processes and activities can be properly supported. This aspect is shown by hypotheses 3 and 4.

### 3.3 CRM Performance and Implementation of IT as Antecedents of Satisfaction

To measure enterprises satisfaction with the results of its determined CRM project in combination with the usage of mobile devices the variable “satisfaction with the CRM project” will be used. This variable shows the over all impression and covers the success of the CRM project over all. Therefore also the question is formulated, if the enterprise would repeat the CRM project.

The satisfaction with the CRM project is influenced by the two variables CRM performance and implementation of IT (see also hypotheses 5 and 6 in Figure 2).

### 3.4 CRM Performance and Implementation of IT as Antecedents of Achieved Objectives

Unlike the variable satisfaction with the CRM project the variables to measure the achieved objective cover certain aspects of CRM projects. Therefore a pre-study was undertaken to collect the objectives of CRM projects for mobile devices (Hartel 2006). The results of this pre.-study have been grouped by topics. According to this pre-study we can differ between objectives related to the enterprise and to the field staff. Furthermore they can be assigned to sub-groups – so called dimensions.

The achieved objectives concerning the whole enterprise are grouped by four dimensions concerning the following aspects:

- finance (e. g. cost reduction or increase of up- and cross-selling)
- customer (e. g. improvement of customer communication or reduction of complaints)
- employees (e. g. improvement of the communication between employees)
- processes (e. g. improvement of effectiveness in sales)

The achieved objectives concerning the field staff using mobile devices are grouped by the following three dimensions:

- time and costs (e. g. reduction of cycle time or time saving by administrative work for sales people)
- quality (e. g. improvement of data and information quality for sales people)

- process for mobile devices (e. g. increase of process automation for sales and service people)

The antecedents to these seven constructs are the two variables “CRM performance” and the “implementation of IT”. Hence the relationship between these two variables and the variables in the certain dimensions are described in the hypotheses 7 until 20 (see Figure 2). All hypotheses in the research model show the following description – for example H7:

*“The CRM performance has an influence on the achieved objectives of the enterprise in the dimension finance.”*

## 4 RESEARCH METHOD AND FURTHER STEPS

### 4.1 Research Method

The proposed research model and its hypotheses represent a structural equation path model. This model can be tested by the Partial Least Squares (PLS) analysis. The PLS procedure was invented by Hermann Wold. It is a second-generation multivariate technique which has the ability to model latent constructs under conditions of non-normality (Chin 1999).

### 4.2 Further Steps

To prove the proposed research model further empirical research is needed. Therefore the variables have to be operationalized by indicator variables. After this the concept of the study has to be planned. This covers the aspects like: data base, sample size, kind of questioning etc. Each indicator variable refers to a question in the questionnaire.

Because of the different market of CRM systems only enterprises of one CRM market should be chosen for interviews – e. g. American CRM market or German speaking CRM market. Thus an influence by the market to the study results can be excluded.

By choosing the enterprises for interviews there should be avoided that there is any influence by a special CRM software product or a consulting company during the CRM project. The chosen enterprises should be free from such influences.

It is also important to select companies which have conducted a CRM project and completed it. Therefore it can be ensured that first influences as

well as long term influences of the CRM project for example in the dimension finance can be observed.

## 5 SUMMARY

The described research model shows a concept to analyze CRM projects in enterprises of the business to business sector. The model covers aspects of CRM strategy and CRM concepts as well as the support of the implemented information technology respective CRM systems. The model points out that the CRM performance and the IT have an influence on the achieved objectives of an CRM project. So the model shows that IT is not the only but an important factor to the success of such a CRM project.

The most important points of the model are that the variable "implementation of mobile information technology" covers all aspects for the use of mobile devices for field staff in sales and services. It is also important that the objectives of the field staff are measured and analyzed by three dimensions concerning aspects like time and costs, quality and processes for mobile devices.

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