IS CUSTOMER RELATIONSHIP MANAGEMENT A SUCCESS FACTOR IN ELECTRONIC COMMERCE?

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ABSTRACT

Customer Relationship Management (CRM) is a concept for increasing companies' profitability by enabling them to identify and concentrate on their profitable customers. The term Electronic Commerce Customer Relationship Management (ECCRM) refers to the application of CRM in electronic commerce, i.e. when business relationships are maintained via the Internet or Worldwide Web.

Previous studies on ECCRM implementations and their impact on businesses have often focused on the process level, technical aspects, or on marketing issues. However, viewed from a higher level, the effect on corporate success in electronic commerce is still unclear. The objective of our study is to examine this effect.

Following a quantitative, indirect, and confirmatory methodology, we construct a covariance structure (or LISREL) model. We test our research hypotheses employing a data set comprising 469 cases of general companies, obtained from a representative survey of 1,308 companies in the German-speaking market. We also distinguish between Business-to-Business (B2B) and Business-to-Consumer (B2C) companies and control for the influence of company size and lag effects.

We find that ECCRM is a critical success factor in electronic commerce, independent of companies' time on the Web. It is especially critical for B2C and small companies.

Keywords: Electronic Commerce Customer Relationship Management (ECCRM), success in electronic commerce, empirical investigation, and structural equation model.

1. Introduction

Customer Relationship Management (CRM) can be understood as a revolving process during which companies interact with their customers, thereby generating, aggregating, and analyzing customer data, and employing the results for service and marketing activities [Seybold, 2001; Strauß & Schoder, 2002, p. 81 f.]. The motivation for companies to manage their customer relationships is to increase profitability by concentrating on the economically valuable customers, thus increasing revenue ("share of wallet") from them, while possibly "de-marketing" and discontinuing the business relationship with less valuable customers.

Electronic Commerce Customer Relationship Management or ECCRM [Kundisch, Wolfersberger, Calamis, & Kloeper, 2001; Romano, Jr. & Fjermestad, 2001a] chiefly relies on Internet or Web-based interaction of companies with their customers. As the term suggests, ECCRM is specifically aimed at supporting electronic commerce, which, in this article, will be understood as the activities related to initiating, negotiating, and executing business transactions online.[1] Since the beginning of the commercial use of the Web, ECCRM has received increasing attention from both practitioners [Adams, 2000; Holden, 2001; Malis, 2000; Orr, 2001] and researchers [Romano, Jr. & Fjermestad, 2001b].

The prospect of higher profitability has lured many companies into launching CRM initiatives and, in particular, ECCRM projects as a central element of their electronic commerce activities. Market projections at the time of the Internet hype saw corporate investments into CRM in general grow at annual rates as high as 50%, eventually

[1] As we employ this broad definition of electronic commerce, our study will also include companies who do not actually sell or take orders, but merely initiate and negotiate business transactions online.

matching and surpassing spendings on ERP systems [Meta Group, 2000]. Even after the end of the hype, more recent projections still predict double-digit growth rates for the years to come [Forrester Research, 2002].

However, not every company seems to profit from their CRM initiatives as expected. A recent study by Gartner [2003] reveals that merely "roughly 50 percent of all CRM projects fail to meet executive management expectations". AMR Research [2002] finds even more devastating evidence for the lacking effectiveness of CRM implementations in practice, stating that only "16% of projects reach the promised land and measurably influence business performance", while in 59% of all CRM projects either the technical implementation or business change and adoption fail. On the contrary, also very positive findings for the outcome of companies' CRM projects are available. E.g., Forrester Research [2003] reports that nearly 75% of North American executives are satisfied with their companies' CRM efforts.

Clearly, these contradictory findings for the business benefit of CRM implementations are hard to reconcile, leaving market observers and decision makers puzzled. Unfortunately, research, especially in the field of electronic commerce, has so far achieved only little to clarify this issue of high practical relevance. As can be seen from a recent overview of existing ECCRM research [Romano, Jr. & Fjermestad, 2001b], previous studies have frequently focused on technical aspects of corporate Web presences (e.g., design, usability, features, and the acceptance of Web pages) or on marketing issues (e.g., customer behavior, satisfaction, and retention, as well as trust). However, there has been little work assuming a corporate perspective, examining how, if at all, ECCRM implementations contribute to corporate success in electronic commerce [Tan, Yen, & Fang, 2002]. Also, past ECCRM studies have often concentrated on specific industries (e.g., the financial industry) or business models (e.g., Web-centric business models). Additionally, to the best of the authors' knowledge, there have been no comprehensive studies comparing the effectiveness of ECCRM for Business-to-Business (B2B) and Business-to-Consumer (B2C) companies or for different company sizes. Furthermore, there appears to be a lack of broad empirical research with validated constructs and measures in the literature. As a result, the impact that the use of the ECCRM concept has on corporate success in electronic commerce remains difficult to assess, especially for decision makers [Malis, 2000].

We shall address this research gap, presenting the results from an empirical investigation based on 469 cases from a representative survey comprising 1,308 cases in the German-speaking market, which constitutes one of the key international electronic commerce markets. We employ a quantitative, indirect, and confirmatory approach, a research methodology which has rarely been used previously in the study of success factors for electronic commerce [Böing, 2001, p. 33; Romano, Jr. & Fjermestad, 2001b, p. 84 f.].

2. Research Model

2.1. Research Aim and Model Perspective

The objective of this paper is to investigate whether the use of ECCRM produces any benefit at the corporate level, thereby attempting to fill the existing research gap identified above. Consequently, we must assume an integrated perspective and choose the corporate level as the level of our analysis and the whole company as the object under study. As we are interested in determining the effect of ECCRM on the company as a whole, we must also take a comprehensive view of the dependent factors, not only concentrating on single facets such as customer loyalty, retention, and brand awareness. We therefore employ the broad concept of corporate success in electronic commerce as the dependent construct. Further, we concentrate on the business benefit from ECCRM as a specific concept. Consequently, we use only directly ECCRM-related concepts as independent constructs in our model and obtain a partial, rather than a total model for corporate success in electronic commerce.

As an extension of previous studies [Romano, Jr. & Fjermestad, 2001a], and as an issue which has been raised for further research [Madeja & Schoder, 2003], we will first examine the effectiveness of ECCRM in general and then in a separate analysis for B2B and B2C companies. To control for company size and possible lag effects [Madeja & Schoder, 2003], we will make an additional series of analyses for different company sizes and for companies grouped according to the duration they have been on the Web.

2.2. The Concept of Corporate Success in Electronic Commerce

We choose to focus our view of the concept of corporate success in electronic commerce on the shareholders' perspective. The concept is viewed and implemented as a complex construct comprising several theoretical subdimensions so as to accommodate the major theories on competitive advantage, value creation, and firm performance [Amit & Zott, 2001]:

1. Hard factors. This reflects economic performance indicated by economic quantities or coefficients, e.g., revenue and profit growth.
2. Soft factors. This accounts for a company's achievement(s) in relation to, or by perception of, its customers, e.g., increased loyalty, improvement of the corporate image, or increased customer satisfaction.

3. Cost reduction. This indicates a company's improvement(s) in process efficiency as well as procurement conditions, e.g., reduced purchasing or marketing costs, therefore covering firm performance from a transaction-cost economical perspective.
4. Innovation. This measures the extent by which a company has strengthened its competitive position from the perspective of Schumpeterian theory, i.e., by being innovative, e.g., by offering new services and by developing new markets.
5. Corporate value. A company's valuation not only depends on its economic or overall performance, but also (mostly) on the way it is perceived by third parties, such as investors. Therefore, this final subdimension is the broadest and most susceptible to external influential factors (micro and macroeconomic, psychological, etc.).

2.3. Model Structure

Figure 1 illustrates the structure of our research model. The central construct in our research model is companies' ECCRM-capability, which we define as companies' knowledge about their customers and their ability to serve their customers based on that knowledge and which can also be interpreted as companies' customer orientation in electronic commerce. Companies' ECCRM-capability serves as a moderating construct, aggregating the effect that several ECCRM instruments, the decision against implementing ECCRM, and managerial competence in planning and implementing ECCRM, have on corporate success in electronic commerce, which is the dependent construct. With the exception explained below, every path depicted in Figure 1 represents a research hypothesis derived in the next subsection.

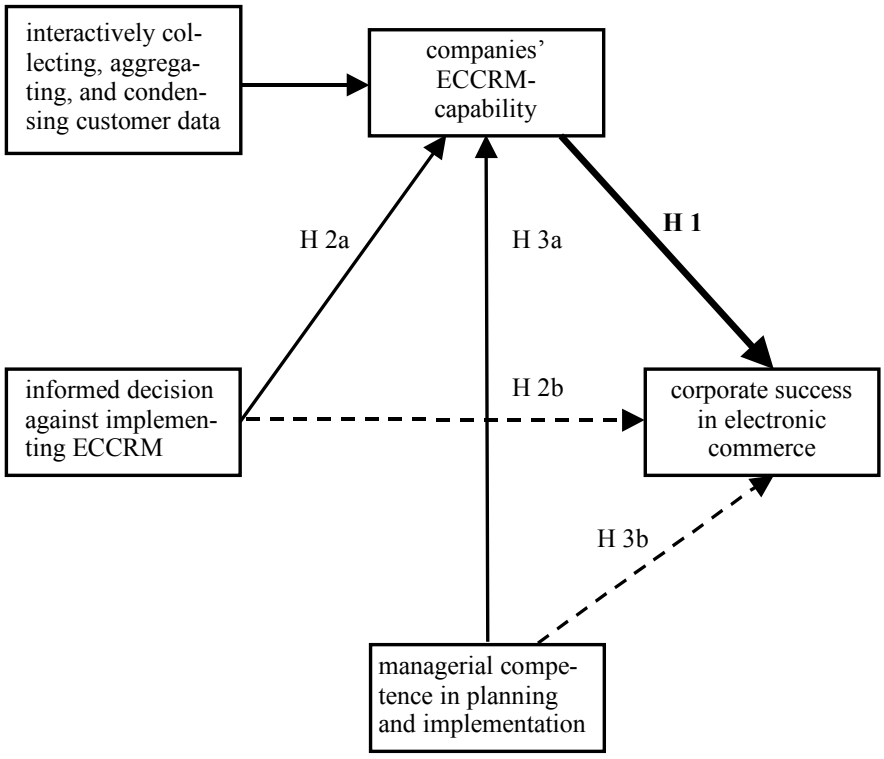

Figure 1: Overview of the research model.

In our model, the ECCRM instruments represents a collection of indicator variables rather than a distinct latent construct. It is mainly for clarity of the model that the ECCRM instruments are drawn as if they were a separate construct. Their only function is to constitute the construct of companies' ECCRM-capability. Therefore, the path between ECCRM instruments and companies' ECCRM-capability in Figure 1 does not represent a model hypothesis, but substitutes a number of path coefficients between these indicator variables and companies' ECCRM-capability. Neither do we include a direct path between the ECCRM instruments (or any of the respective indicator variables) and the construct for corporate success in electronic commerce, as in [Madeja & Schoder, 2003], from which two further benefits arise: Apart from the fact that excluding the direct paths leads to a technically more parsimonious

Structural Equation Model (SEM), we avoid the problem of possibly obtaining competing direct and indirect paths of different sign between the ECCRM instruments and the construct for corporate success in electronic commerce, as in the findings in [Madeja & Schoder, 2003].

2.4. Literature Review and Derivation of Model Hypotheses

Our primary hypothesis follows directly from the introductory literature and from numerous case studies [e.g., Kanna, Tan, Handfield, & Ghosh, 1998; Strauβ, 2002, p. 79 ff.]. Companies which are able to manage their customer relationships and, thus, focus mainly on profitable customers are more successful than companies which, in an economic sense, waste their resources serving unprofitable customers:

Hypothesis H_1: Companies' ECCRM-capability positively contributes to corporate success in electronic commerce.[2]

It is evident from our initial definition that companies who strive to actively manage the relationships with their customers must first of all know their customers and therefore need to collect customer data. As shown in studies of Website usability and user interaction, the most effective way of collecting customer data is online, in an interactive, feature-rich environment, in order to meet customers' expectations of a company's Website, thereby increasing their convenience and loyalty [Breitenbach & Van Doren, 1998; Jutla, Craig, & Bodoik, 2001; Kuk & Yeung, 2002]. Additionally, corporate Web sites should generate value for customers in exchange for their information [Abela & Sacconaghi, 1997]. Adams [2000] recommends subsidized electronic commerce functionalities (online trading in the case of the banking industry) as a measure for retaining customers. As an intermediate step between interacting with customers and analyzing customer data based on individual profiles, a company should attain a unified view of its customers. This is achieved by aggregating and condensing customer data [Yu, 2001]. To summarize these considerations, the collection of indicator variables representing ECCRM instruments in our model should comprise the collection and aggregation of customer data as well as Web site features designed for increasing customer loyalty.

As with every other electronic commerce concept, ECCRM may not be suitable for every company, and there are possibly many companies that resist the implementation of ECCRM. A number of reasons for companies' resistance to ECCRM implementations can be listed:

E.g., a company might be able to build up considerable customer knowledge and service expertise in the course of its regular business processes, even without conducting specific ECCRM projects. Or the business model and the market environment do not require customer knowledge and service expertise to an extent which would justify the organizational effort for ECCRM implementations. The technical complexity and potential risks of ECCRM implementations, which translate into project costs, may be cited as further factors that might deter companies from investing in software packages, consulting projects, and reorganization efforts.

Finally, some companies may resist the implementation of ECCRM because they might fear, e.g., that certain legal issues concerning customers' privacy may not have been resolved yet, which would make the collection and aggregation of customer data for ECCRM a legal risk. Customer privacy issues are especially important in the B2C segment, because particularly consumers are very sensitive to infringements on their privacy and are concerned that profiles based on their personal data, surfing habits, and shopping behavior may be abused [Culnan, 1993, Chung & Paynter, 2002]. As Marchany and Tront [2002] note: "consumer privacy is becoming the most publicized security issue […] in e-commerce." If consumers feel that a company violates their personal rights, they are likely to turn away from that company and take their business elsewhere. Or, in an even worse scenario, they might raise protests, causing other consumers to turn away from that company, too. Due to its potentially business-critical nature, we consider this last one as the most severe among the reasons for companies' resistance to ECCRM implementations.

On the one hand, it is obvious that companies which opt against implementing ECCRM will have a lower ability to address and serve their customers individually than companies which decide in favor of implementing ECCRM. On the other hand, if companies have made an active and informed decision against the implementation of ECCRM, we propose that the expertise gained during the underlying process of information gathering and analysis may save them from making a futile investment in ECCRM and should be a driver for corporate success in electronic commerce:

Hypothesis H_{2a}: Companies' active and informed decision not to implement ECCRM negatively correlates with their ECCRM-capability.

[2] Terms like "A impacts B," "A contributes to B," or "A influences B" are to be understood as expressing a causal dependence of the type "the more A, the more B" or "A corresponds to B."

Hypothesis H_{2b}: Companies' active and informed decision not to implement ECCRM positively correlates with corporate success in electronic commerce.

The issues and difficulties in planning and implementing ECCRM comprise technical and organizational challenges. They have become the subject of numerous articles in scientific research [Gefen & Ridings, 2002; Wilson, Daniel, & McDonald, 2002] and practitioners' literature [Holden, 2001; Malis, 2000; Orr, 2001]:

An ECCRM system must be selected (or built), configured, and integrated with existing systems. Yet, e.g., commercial ECCRM systems might provide only insufficient functionalities and require costly customization or additional development efforts. Moreover, it must be implemented into the business processes of the respective company, i.e., the employees need to be able to use the system and be motivated to actually do so [Davis, 2002]. This involves employee training on how to use the ECCRM system and may further necessitate reorganization and communications efforts, as organizations usually resist change [Kotorov, 2002].

Therefore, decision makers competent in managing these issues and difficulties are key factors in determining their company's success in ECCRM. As these executives should also be able successfully to manage other electronic commerce or electronic business initiatives, they can be regarded as a key factor for their company's success in electronic commerce in general. This leads us to our final pair of hypotheses:

Hypothesis H_{3a}: Managerial competence in planning and implementing ECCRM promotes companies' ECCRM-capability.

Hypothesis H_{3b}: Managerial competence in planning and implementing ECCRM positively correlates with success in electronic commerce.

3. Method

The research model as presented above is implemented as a structural equation model (SEM) or, more specifically, as a covariance structure model (also known as a LISREL model). This model is tested with numerical data obtained from a large-scale survey. After construct reliability and global model fit have been assessed, the numerical results are evaluated to establish if they give support to the research hypotheses.

3.1. The Survey

The numerical data used in the statistical analysis of this model were collected in a large survey that was conducted from May to June 2000 and which was published as the "e-Reality 2000 Study" in September 2000, including an extensive descriptive analysis [Strauß & Schoder, 2000]. This survey was targeted at decision makers of companies in the German-speaking area of Europe, specifically Germany, Austria, and Switzerland. All data was gathered in personal interviews which market research professionals from Infratest Burke, Munich, Germany, conducted with upper- to top-level executives from 1,308 companies. The executives were questioned about the implementation of ECCRM in their companies, among other e-business concepts and initiatives. Specifically, they were asked to assess the success that their companies had achieved with their electronic commerce activities, using a broad set of measures. The 1,308 companies were explicitly selected according to a superset of company data so as to render the survey representative with respect to company size and industry in the German-speaking market. When an interview could not be conducted as planned, a replacement company was determined from the same superset in order to maintain the representative nature of the sample.

3.2. Aggregation of Survey Data

Prior to the statistical analysis, the gathered raw data is condensed to an essential subset as follows: In a first step, we eliminate the data from companies which were not active in electronic commerce and, thus, neither employing ECCRM at the time of the survey, reducing the original data set to 730 cases. In a second step, we reject a number of 261 cases, where the respective company representative specified that his or her company had not yet gained sufficient online experience to provide information on the success of its electronic commerce activities, leaving a total of 469 valid cases as the base for our numerical analyses.

Thereby, we stepwise omit those cases which cannot contribute to our analysis of the relationship between the use of ECCRM and corporate success in electronic commerce. It is important to note, however, that through the exclusion of cases, the applicability and transferability of our results to general companies in the German-speaking area or to companies active in electronic commerce is somewhat limited.

In order to investigate a possible deviation in the composition of the remaining data set from that of the original data set with respect to company size and industry, a chi-square test is performed for each of these variables: The respective frequency distribution from the 1,308 cases (which, by the construction of the survey, is representative for the German-speaking area) is used as the reference distribution, against which the frequency distribution from the 469 cases is tested. The numerical results show that the remaining 469 cases represent a different statistical universe

than the original 1,308 cases. Specifically, with respect to the industry background, the frequency distributions suggest that the finance, insurance, and real estate industries, the service industry, and public administrations are overrepresented in the 469 cases, while the construction and the manufacturing industries are underrepresented. Further, the frequency distributions show that the remaining data set of 469 cases is biased towards medium-sized and large companies.

In a similar way, we perform another series of chi-square tests in order to determine whether companies' use of ECCRM and ECCRM capability in the remaining 469 cases differ from that of all 730 cases who were active in electronic commerce. The results suggest that the 469 cases, who reported the success of their electronic commerce activities, are not biased towards higher than usual ECCRM usage and capability levels. On the other hand, a series of chi-square tests for the remaining 261 companies, who did not report the success of their electronic commerce activities, reveals that these are biased towards lower than usual ECCRM usage, while their ECCRM capability does not differ from those of all 730 cases.

3.3. Descriptive Analysis of the Numerical Base

Sample information for the 469 cases employed in our numerical analyses is given in Table 1. Concerning the use of ECCRM techniques, 23.0% (108) of the companies either actively or passively collect and 28.0% (131) aggregate customer data. A total of 46.1% (216) feel that, on the basis of their customer data, they can either economically provide individual service to their customers or classify their most important customers. Finally, 64 companies (13.6%) refuse to use ECCRM techniques because they fear that either legal issues or consumer protests might arise.

Table 1: Sample information for the remaining 469 cases employed in the statistical analysis.

<table>
<tr><th>industry background[1]</th><th>company size (no. of employees)</th><th>main customer segment</th><th>experience on the web</th><th>organizational form</th></tr>
<tr><td>23.1% (108)[2,3] manufacturing sector</td><td rowspan="2">30.3% (142) small companies with fewer than 20</td><td rowspan="3">45.8% (215) B2B companies</td><td rowspan="3">48.0% (225) with up to 2 years</td><td rowspan="2">95.8% (450) traditional "brick-and-mortar-" companies</td></tr>
<tr><td>5.8% (27) transportation, communication, and utilities</td></tr>
<tr><td>9.8% (46) construction</td><td rowspan="3">43.3% (203) medium (-sized) companies with more than 20, yet fewer than 50</td><td rowspan="3">2.3% (11) spin-offs</td></tr>
<tr><td>25.3% (119) trade sector (retail and wholesale)</td><td rowspan="2">47.8% (224) B2C companies</td><td rowspan="2">51.4% (241) with 2 years or more</td></tr>
<tr><td>12.0% (56) finance, insurance, or real estate.</td></tr>
<tr><td>19.0% (89) service industry</td><td rowspan="2">21.6% (101) large companies with 50 or more</td><td rowspan="2">0.6% (2) electronic commerce start-ups</td></tr>
<tr><td>1.1% (5) public administration</td></tr>
</table>

Notes: [1] – Grouped according to the US Standard Industrial Classification (SIC).
[2] – Figures in brackets indicate number of cases.
[3] – Total of fractions (number of cases) short of 100% (469 cases) are due to missing values.

Table 2: Operationalization of the constructs, quality measures, and wording of indicator variables:

construct/ influential factor	abbreviated wording of the indicator variable	standar-dized regression weights	indicator reliability (>= 0.4?)	composite reliability (>= 0.6?)	avg. fraction of rec. variance (>= 0.5?)	Cron-bach's Alpha (>= 0.7?)
ECCRM-capability	"we try to aggregate and condense different sources of information about our customers"	0.324	N/A.	N/A	N/A	N/A
	"we actively collect customer data (e.g., with questionnaires)"	0.184	N/A.			
	"we passively collect data from customers accessing our web sites (e.g., tracking or logging their PC)"	0.083	N/A.			
	number of online instruments for customer retention/loyalty	0.545	N/A			
	"we can categorize important customers with the data obtained"	0.638	0.407	0.555	0.385	0.837
	"we can provide efficient individual service with the data obtained"	0.602	0.363			
informed decision ag. implem. ECCRM	"we will not implement CRM as we fear legal issues concerning privacy"	0.754	0.569	0.783	0.644	0.810
	"we will not implement CRM as we fear negative consumer reactions"	0.848	0.719			
managerial competence in planning and imple-mentation	"choosing adequate CRM-software is a very complex issue"	0.764	0.584	0.869	0.455	0.869
	"standard CRM-software provides only insufficient functionality"	0.707	0.499			
	"high costs arise from further developing standard CRM-software in house"	0.738	0.544			
	"customer data is usually distributed across several systems and does not provide a consolidated view"	0.568	0.323			
	"IT-integration requires additional reorganization"	0.614	0.377			
	"integration of CRM with existing IT-infrastructure is extremely costly"	0.657	0.431			
	"for the implementation, intensive communication is needed to overcome internal resistance"	0.629	0.396			
	"CRM implementation requires high expenses for training"	0.695	0.483			
corporate success in electronic commerce	"hard factors"	0.811	0.658	0.847	0.528	0.827
	"soft factors"	0.779	0.607			
	cost reduction	0.614	0.377			
	innovation	0.752	0.566			
	company value	0.656	0.430			

Note: Path coefficients between constructs and selected fractions of explained variance (bold figures in the middle of each cell) and 95% confidence intervals (figure on top and bottom of each cell). Significance levels for the path coefficients are indicated as follows: ***= significant at the 1% level, **= significant at the 5% level, and *= significant at the 10% level.

3.4. Encoding of Variables and Operationalization of Independent Constructs

In the survey, indicator variables have usually been operationalized on an equidistant interval (or Likert-like) scale ranging from "1" (representing strong dissent) to "5" (representing strong agreement). The indicator variable "number of CRM features" has been obtained for every case as the number of items which the respective company employs on its Web site for customer retention (as indicated on a checklist of 9 instruments). All constructs are implemented as multi-item measures in the model, i.e., indirectly measured via several indicator variables. The operationalization of the constructs and the wording of the respective indicator variables are displayed in Table 2.

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The concept of companies' ECCRM-capability and its constituting factors, the ECCRM instruments (the collection of indicator variables that has is drawn as a separate construct in Figure 1), are integrated into a single MIMIC-construct [Multiple Indicator Multiple Causes construct, cf. Bollen, 1989, pp. 313 ff.]. On the one hand, the two indicator variables, describing (and, thus, reflecting) companies' ECCRM-capability are modeled as reflective indicators. On the other hand, the four indicator variables characterizing the factors that determine or cause companies' ECCRM-capability are implemented as causal (or formative) indicators. The interrelations between these four formative indicators have been modeled as correlations, because unlike in the case of reflective indicators, they are not caused by a common superordinate construct. As this construct representing companies' ECCRM-capability is influenced by other constructs and, thus, is partially endogenous, an error variable has been added.

3.6. Operationalization of the Concept of Corporate Success in Electronic Commerce

Every subdimension of the dependent construct for corporate success in electronic commerce consists of a score obtained from the unweighted addition of the values of two to four underlying indicator variables from a total of 13 indicator variables (each also measured on an equidistant interval scale ranging from "1" to "5"). Only the subdimension "increased corporate value" is measured by a single indicator variable. The wordings of the indicator variables forming the score values of each subdimension are:

1. hard factors: "increased market share", "increased revenues", and "increased overall corporate earnings",
2. soft factors: "improved corporate image", "increased customer retention", "increased customer satisfaction", and "increased customer loyalty",
3. cost reduction: "reduced marketing costs", "reduced sales costs", and "purchased more cheaply",
4. innovation: "developed new markets" as well as "offered new services", and
5. corporate value: "increased corporate value".

3.7. Statistical Analysis of the Numerical Model

On the basis of the aggregated survey data, the coefficients in the covariance structure model are estimated in James Arbuckle's AMOS 4.0. The Unweighted Least Squares (ULS) method is employed, because the observed variables in the data set do not follow a multivariate normal distribution. As significance values and confidence intervals are not reported for this estimation method, they must be obtained from repeated bootstrap analyses (1,000 samples). Also, differences between model parameters for separate numerical bases cannot be analyzed with chi-square-tests or critical ratios, but must be assessed by comparing the model parameters, the respective confidence intervals, and their overlap.

The numerical estimation procedure is performed simultaneously for several analyses, each consisting of the same structural model, but differing in the numerical base. The purpose of employing the numerical base as a whole and as subsets from different cross-sections (i.e. looking at the same data set from different angles) is to test model validity for the general case as well as for the case of specific categories of companies, and to compare different categories of companies in order to identify differences in the strength and significance of interrelations between the hypothesized constructs. The numerical base is varied as follows:

1. In the first analysis, the general set of all 469 companies is employed.
2. The second and third analyses are performed on the subsets of 215 B2B and 224 B2C companies only.
3. The fourth through sixth analyses are based on the subsets of 101 large, 202 medium-sized, and 142 small companies and are intended to provide control for company size. In the case of the subset of 101 large

companies, the construct for rejecting ECCRM (H_{2a} and H_{2b}) must be excluded from the numerical analysis, since it causes convergence problems. A look at the data set reveals that only 6 (5.9%) of the 101 large companies refuse to implement ECCRM, rendering this construct irrelevant for the group of large companies.

4. The seventh and eighth analyses use the group of 225 companies with up to 2 years and the group of 241 companies with more than 2 years of experience on the Web at the time of the survey. With this step, we intend to control for the effect that companies' experience on the Web may have on their ability to benefit from ECCRM, which can also be understood as controling for lag effects. Companies which were new to the Web (and, thus, to ECCRM) at the time of the survey may have been employing ECCRM already, but, as the net benefit takes time to evolve, may have been unable to increase their corporate success in electronic commerce.

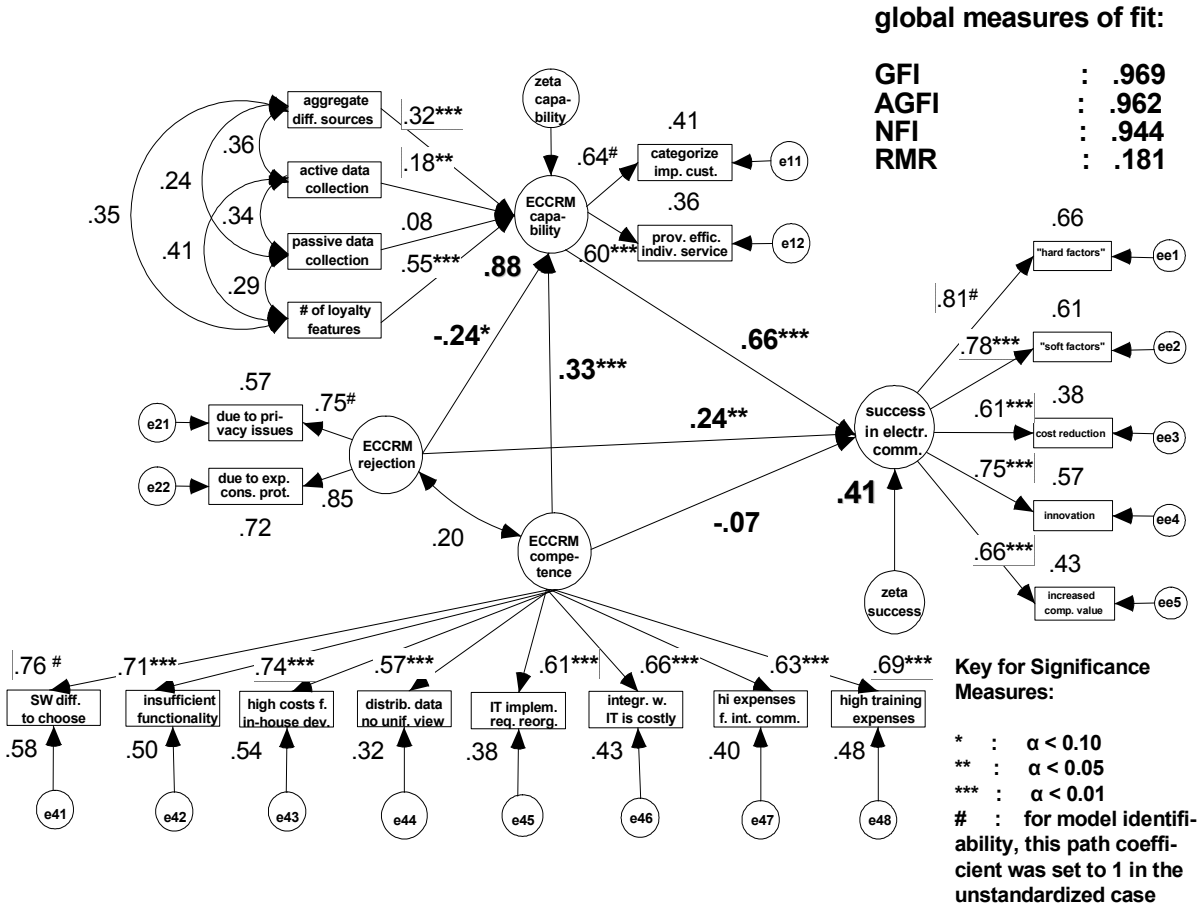

Figure 2: Covariance structure model and results of the estimation

During the simultaneous parameter estimation for all analyses, we set the unstandardized path coefficients between the complex constructs and their reflective indicator variables as equal for all analyses. Thereby, all analyses are aggregated to become a single comprehensive analysis and the number of parameters to be estimated is reduced (in comparison to estimating a separate set of parameters for every analysis), thus making the estimation procedure more efficient [Arbuckle & Wothke, 1999, pp. 223, 234]. Also, the simultaneous parameter estimation results in one set of measures for global model fit. Further, although the resulting standardized path coefficients between complex constructs and reflective indicator variables are not exactly equal,[3] we assess construct reliability

[3] This is a consequence from setting the unstandardized path coefficients between the complex constructs and their reflective indicator variables to be equal for all analyses, thereby implying that the model and factor structure is valid for all numerical

and validity based on the numerical data for the case of all 469 companies and generalize the results for all analyses (cf. next subsection). Finally, in order to stabilize the estimation algorithm (and prevent a Heywood case), the variance of the error term of the construct of companies' ECCRM-capability is fixed to the same value for all analyses.

Figure 2 shows the complete covariance structure model and the numerical results of the estimation for the case of 469 general companies. Path coefficients between the complex constructs and fractions of explained variance are listed for all estimations in Table 3.

Table 3: Path coefficients between constructs and selected fractions of explained variance with their respective 95% confidence intervals:

	description of path or complex construct	**general case**	**main customer segment**		**company size**			**years of experience on the web**	
			B2B	**B2C**	**large**	**medium**	**small**	**up to 2**	**more than 2**
path coeffi-cients	ECCRM-capability → success in e-commerce	0.579 **0.662***** 1.052	0.261 **0.408***** 0.614	0.633 **0.734***** 0.995	0.498 **0.670***** 0.938	0.355 **0.530***** 1.214	0.727 **0.857***** 1.110	0.566 **0.675***** 1.211	0.537 **0.657***** 0.969
	decision against ECCRM → ECCRM-capability	-0.926 **-0.236*** 0.037	-0.051 **-0.231** 0.407	-0.801 **-0.161** 0.143	n.a.	-0.936 **-0.453**** -0.071	-0.480 **-0.110** 0.317	-1.319 **-0.145** 0.298	-0.732 **-0.261** 0.081
	decision against ECCRM → success in e-commerce	0.038 **0.241**** 1.110	-0.237 **-0.027** 0.236	0.068 **0.324**** 1.093	n.a.	-0.108 **0.182** 1.192	0.131 **0.636**** 2.554	-0.166 **0.169** 1.703	0.056 **0.357**** 0.923
	ECCRM competence → ECCRM-capability	0.160 **0.335***** 0.778	-0.051 **0.187** 0.407	0.075 **0.337**** 0.775	-0.153 **0.281** 0.634	-0.186 **0.097** 0.480	0.262 **0.538***** 0.815	-0.161 **0.216** 1.131	0.143 **0.352***** 0.599
	ECCRM compe-tence → success in e-commerce	-0.698 **-0.071** 0.063	-0.064 **0.136** 0.303	-0.777 **-0.202**** 0.000	-0.514 **-0.098** 0.235	-0.296 **0.196** 0.444	-2.236 **-0.452***** -0.134	-1.456 **-0.107** 0.150	-0.347 **0.010** 0.196
fractions of expl. variance	ECCRM-capability	0.806 **0.877** 1.003	0.756 **0.875** 1.002	0.849 **0.912** 1.001	0.659 **0.800** 1.005	0.765 **0.864** 1.002	0.851 **0.918** 1.002	0.692 **0.824** 1.003	0.857 **0.916** 1.001
	corporate success in electronic commerce	0.323 **0.414** 0.538	0.103 **0.211** 0.387	0.415 **0.533** 0.718	0.243 **0.422** 0.708	0.159 **0.284** 0.510	0.538 **0.839** 2.908	0.319 **0.444** 0.662	0.323 **0.448** 0.706

Note: Path coefficients between constructs and selected fractions of explained variance (bold figures in the middle of each cell) and 95% confidence intervals (figure on top and bottom of each cell).
Significance levels for the path coefficients are indicated as follows: ***= significant at the 1% level, **= significant at the 5% level, and *= significant at the 10% level.

3.8. Construct Reliability and Local Fit Measures

Table 2 shows the constructs employed in the structural model and the respective indicator (or manifest) variables used for their operationalization. Additionally, path coefficients (standardized regression weights for all

bases (which is a simplification). In reality, however, the covariance matrices vary slightly for the differing numerical bases, and thus the error variances and the variances of the complex constructs in the structural model also vary across the analyses.

469 companies) between each latent variable and its manifest variables are given, as well as reliability measures. For the latter, minimum values as they are commonly used in literature [e.g. Nunnally, 1978; Fornell & Larcker, 1981; Bagozzi & Yi, 1988] are included. Note that no reliability measures can be given for the left half of the MIMIC-construct for companies' ECCRM-capability, because it is measured with formative indicators for which the reliability criteria used to characterize reflective constructs cannot be applied [Cohen, Cohen, Teresi, Marchi, & Velez, 1990].

All estimated standardized regression weights for reflective indicators in Table 2 are highly significant at the 1% level (for the four formative indicators, cf. Figure 2). Further, comparing the reliability and quality measures for the constructs and items with the recommended minimum values, we find that with only a few exceptions, the recommended minimum values are met or even clearly exceeded. We therefore conclude that our factors constitute reliable constructs within the structural model.

3.9. Measures for Global Model Fit

The measures for global model fit included in Figure 2 mostly suggest that our covariance structure model fits the underlying data quite well. The values for the goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and normed fit index (NFI) clearly exceed the recommended minimum value of 0.9 [cf. Bagozzi & Yi, 1988, Bentler & Bonnett, 1980]. The root mean square residual (RMR) value of 0.181 can be mainly attributed to the fact that we have aggregated the subdimensions of the construct for corporate success in electronic commerce to score values by unweighted addition, causing relatively large numerical values. We conclude that our model exhibits sufficient overall numerical fit and need not be rejected. Note that, as the ULS method was used for estimating the model coefficients, and as the values of several indicator variables are not distributed normally, certain indices and quality measures for global model fit (e.g. the comparative fit index, CFI, or the chi-square value) are not applicable, and have therefore not been calculated. As our model also fulfills the Fornell/Larcker-criterion [Fornell & Larcker, 1981, p. 46], our factors can be considered to have sufficient discriminant validity (i.e., there are no competing independent constructs).

4. Results of the Statistical Analysis

The numerical results for our research model can be obtained directly from the path coefficients and significance measures in the covariance structure model displayed in Figure 1 and Table 3:

First of all, we obtain strong support for our primary hypothesis H_1 in the general case as well as in every single special case. Companies' ECCRM-capability, as we have modeled it in this set of analyses, proves to correlate positively to corporate success in electronic commerce. Further, except for the case of medium-sized enterprises, our analyses yield no support for hypothesis H_{2a}. (Considering the large sample size of 469 cases employed for the numerical analysis of the general case, the significance of the path coefficient for H_{2a} at the mere 10%-level cannot be considered sufficient.) Also, the results of our analyses support hypotheses H_{2b} and H_{3a} each in the general case as well as in the case of B2C companies, small companies, and companies with more than 2 years of experience on the Web. Finally, except for the case of small companies, no support can be found for hypothesis H_{3b}.

Moreover, we find that the fraction of explained variance in the construct of companies' ECCRM-capability proves to be consistently high for all analyses. The fraction of explained variance in the construct of corporate success in electronic commerce, however, varies considerably: On the one hand, it proves to be about the same for the general case, the case of large companies, as well as for companies split up according to their experience on the Web (regardless if they have been online for up to or for more than 2 years). On the other hand, it is considerably lower in the case of B2B and medium-sized companies than in the general case. (The confidence intervals for this fraction of explained variance in either specific analysis and in the general analysis are not completely disjunctive, but the value for the fraction of explained variance in either specific analysis lies outside the confidence interval determined in the analysis of the general case.) In the case of small companies, the fraction of explained variance in the construct of corporate success in electronic commerce is significantly higher than in the general case (disjunctive confidence intervals).

Comparing the analysis for the subset of B2B companies with that for the subset of B2C companies, we find that the fraction of explained variance in the construct of corporate success in electronic commerce is significantly higher in the B2C companies (disjunctive confidence intervals). An explanation for this difference is found from comparing the path coefficients for these subsets. We find that the pair of path coefficients corresponding to hypothesis H_1 follow the same pattern. Furthermore, the path coefficients for hypotheses H_{2b} and H_{3b}, significantly load on the construct of corporate success in electronic commerce only for the subset of B2C companies.

5. Critical Discussion

5.1. Summary, Analysis, and Explanation of the Findings

Our research, based on an indirect, quantitative, and confirmatory approach, provides empirical results from a large-scale representative survey about the use and business value of ECCRM. Apart from a number of reliable complex constructs, especially for corporate success in electronic commerce, we have obtained empirical evidence backing some of our hypotheses, while some of the findings still need to be discussed:

First of all, our central hypothesis has been that companies' ECCRM-capability, defined as companies' knowledge about their customers and their ability to serve their customers based on that knowledge, is a success factor in electronic commerce. Our analyses have provided strong numerical support for this hypothesis in the general case, as well as for all subsets obtained from different cross sections through a broad base of companies.

Second, the numerical results of our analyses suggest that, in general and for all subsets of companies (except for the medium-sized companies), the active and informed decision not to implement ECCRM does not significantly reduce companies' ECCRM-capability, yet tends to increase corporate success in electronic commerce. The second half of this statement is not surprising; it corresponds to our research hypothesis H_{2b}. The first half, however, is: How come, in contrast to our research hypothesis H_{2a}, the active decision not to implement ECCRM has no significant negative impact on companies' ECCRM-capability? These empirical findings may be reconciled as follows: It is feasible that those companies who stated that they refuse to implement ECCRM have already attained a considerable ECCRM-capability, i.e. knowledge about their customers and ability to serve them based on that knowledge, such that they do not need to conduct any ECCRM projects. This reasoning would match the empirical evidence we have received in support of research hypothesis H_{2b}: Consequently, for these companies, further ECCRM projects demand more organizational resources than the value they generate, such that no substantial net value is created. Therefore, these companies are likely to achieve a higher success in electronic commerce if they resist than if they conduct additional ECCRM implementations

Third, managerial competence in planning and implementing ECCRM has been found to increase their companies' ECCRM-capability (in the general case and for some of the subsets of companies), while it does not increase their companies' success in electronic commerce (except for the case of small companies). Seemingly, with the exception of small companies, companies are unable to leverage their managers' competence in ECCRM in order to increase their success in electronic commerce. This may be due to the fact that usually, the managerial competence in ECCRM that is built up inside a company is not used in the planning and implementation of other electronic business concepts (e.g. because different teams work on different electronic business projects or even external consultants are involved who take their competence with them once that the implementation is finished) – except for in small companies, where a team that works on an ECCRM project is likely to be assigned to other electronic business projects, too. Or maybe the managerial competence in ECCRM is just not transferable to other electronic business concepts or management areas.

Fourth, as we have been able to explain a consistently high fraction of variance in the construct of companies' ECCRM-capability in our analyses, we believe that we have included all relevant influential factors of this construct in our research and numerical model. Managerial competence in planning and implementing ECCRM proves to be one such factor.

Similarly, in all our numerical analyses we have also explained a considerable fraction of variance of the dependent construct representing corporate success in electronic commerce. This shows that ECCRM is a critical success factor in electronic commerce, although its importance seems to vary greatly with the type of company.

Next, we can obtain further insights into the importance and effectiveness of the ECCRM concept for specific types of companies by comparing the results of our analyses of different subsets of the data set. Correlations that are insignificant in the general case may prove to be significant in some special cases vice versa. In particular, we will discuss the differences between B2B and B2C companies, the differences between large, medium, and small companies as well as the differences between companies with up to two and more than two years of experience on the Web in the following:

Our separate analyses for companies operating in the B2B and B2C segments provide evidence that the ECCRM concept, its instruments and accompanying know-how, is a significantly more important success factor for B2C than it is for B2B companies. This finding can be understood from comparing the customer structure in each segment.

First of all, the personal motivation as well as the degree of emotional involvement in the business transactions to be conducted via the Web is considerably higher for consumers than for business customers. Consumers usually shop for their own account, trying to satisfy several needs from shopping on the Web besides actually purchasing products and services (e.g. they also seek entertainment from shopping online). They also give away their personal information (such as their address, credit card data, and preferences) when ordering products and services on the Web. On the other hand, B2B customers (i.e. corporate buyers) purchase for their companies, as a part of their job. Although they are typically subjected to purchasing guidelines determined by their organization, and, therefore, less

flexible in their buying decisions, they usually do not need to disclose their personal information to the extent to which B2C customers do. Second, in the B2C segment, the customer is always an individual consumer, whereas a B2B customer is usually an organization comprising several persons. Therefore, a B2B company typically has to interact with several persons on every customer's site. Third, B2B companies use a variety of selling mechanisms that may include, for example, participation in auctions and marketplaces, making it impossible to interact directly and personally with customers as can be done via a Web storefront. For all of these reasons, a typical B2B customer may be more difficult to target individually than a B2C customer. Consequently, the benefits arising from the use of the ECCRM concept are probably more difficult for the seller to achieve.

Due to the differences in personal and emotional involvement and due to the greater extent of personal information involved, privacy issues can be considered a far more critical issue when selling to consumers than when selling to businesses. Therefore, B2C companies opting against ECCRM avoid privacy issues and potential customer protests and could thus be more successful than ECCRM adopters among the B2C companies, while this mechanism is irrelevant for B2B companies' success in electronic commerce. This reasoning can be used as an explanation for our findings for H_{2b}.

Further, the estimated path coefficients for H_{3a} and H_{3b} may be interpreted as reflecting a learning process. Companies build up their ECCRM-competence, which increases their ECCRM-capability. However, this involves the use of company resources, resulting in a negative direct impact on success in electronic commerce. As success in the B2C segment is more sensitively linked to the ECCRM concept than in the B2B segment, the path coefficients for H_{3a} and H_{3b} are significant in the analysis of B2C companies only.

Our three model analyses controlling for company size show great differences between the results for large and medium-sized companies on the one hand and small companies on the other hand. The construct for rejecting ECCRM (corresponding to H_{2a} and H_{2b}) cannot be included in the analysis for large companies, which means that rejecting ECCRM is just not an issue for large companies (cf. above). The results for this construct in the case of medium companies hint at the fact that ECCRM is also a "must" for medium companies: Rejecting ECCRM clearly leads to a below-average ECCRM-capability (i.e. medium companies strongly depend on ECCRM in order to have an understanding of their customers) and does not contribute to their success in electronic commerce (i.e. the savings from refusing to implement ECCRM lead to no net benefit for medium companies). Then why is it that for large and medium-sized companies managerial ECCRM competence has no significant effect either on ECCRM-capability or on corporate success in electronic commerce? Maybe large and medium-sized companies rely on external consultants and system vendors for their ECCRM implementations so that their internal competence becomes relatively unimportant.

For the group of small companies, we obtain rather different results, which also appear inconsistent at first glance: ECCRM-capability seems to be the central success driver for small companies, as can be seen from the path coefficient for H_1 and the fraction of explained variance in the construct of corporate success in electronic commerce, either one being the highest respective value of all analyses. Nevertheless, the numerical results for H_{2a} and H_{2b} suggest that small companies should decide against ECCRM implementations: While rejecting ECCRM has no effect on their ECCRM-capability (i.e. does not have a negative impact on their understanding of their customers), it apparently leads to great benefits (e.g. by saving the costs of the ECCRM implementation or by avoiding legal issues and conflicts with their customers). How can this seeming inconsistency between the results for H_1 on the one and for H_{2a} and H_{2b} on the other hand be resolved?

An explanation may be that small companies usually have limited financial resources and, frequently, have only a few customers. Therefore, compared to larger companies, they must operate with a very high level of individual understanding of and service orientation towards their customers. But, because of their limited financial resources, small companies typically cannot afford to implement special ECCRM instruments, yet must realize their ECCRM-capability in terms of their regular business processes. Moreover, as small companies realize their ECCRM-capability without conducting costly ECCRM projects, the decision against a special ECCRM implementation does not affect their ECCRM-capability (cf. result for H_{2a}).

Further, if small companies build up internal ECCRM competence, this strongly increases their ECCRM-capability, but decreases their success in electronic commerce (cf. results for H_{3a} and H_{3b}). In the same way as in the case of B2C companies, this may be interpreted as trading in firm resources in order to build up ECCRM-capability. – Finally, the magnitude of the path coefficients obtained for the group of small companies indicates that for them, success in electronic commerce is even more closely linked to the ECCRM concept and related issues than it is for B2C companies.

Our last two analyses for companies with up to, and more than, 2 years of Web experience, respectively, reveal no substantial differences between these groups. In particular, the impact of companies ECCRM-capability on corporate success in electronic commerce is almost the same for both groups (as can be seen from the path

coefficients for H_1 and the fractions of explained variance in the success construct). This observation suggests that the effect of the ECCRM concept does not depend on the length of a company's time on the Web. In both cases, companies do not significantly decrease their ECCRM-capability by refusing to implement ECCRM and they cannot leverage their ECCRM-specific managerial competence in order to increase their success in electronic commerce. However, minor differences exist between the two groups. Only companies with more than 2 years of Web experience can increase their success in electronic commerce by refusing to implement ECCRM and increase their ECCRM-capability by building up internal ECCRM competence. Perhaps companies with longer Web experience, as opposed to the group of companies with short Web experience, have reached a certain state of maturity, such that the deliberate decision not to implement ECCRM becomes a differentiating criterion for success in electronic commerce? Similarly, it may take a certain experience before managerial ECCRM competence significantly improves companies' ECCRM-capability.

5.2. Limitations and Weaknesses of the Research

As our survey featured ECCRM as only one of many other issues and concepts related to electronic commerce, it must be conceded that the resolution and granularity with which the tested constructs have been implemented is somewhat low in some places. Ideally, it would have been helpful to measure more items for the ECCRM instruments in order to record how companies analyze and further process customer data after aggregation. Similarly, it would have been desirable to implement a more refined and objective measure for assessing how companies' ECCRM-capability translates into concrete action.

During our study, we attempted to control for lag effects in our series of analyses, but they may, unnoticed to us, still have affected the companies in our analysis. The reason for this is that we divided the companies into two groups according to their experience on the Web, which does not necessarily correspond to their experience with ECCRM. Furthermore (especially in the German-speaking market), the ECCRM concept must be viewed as being still in the emerging phase at the time of the survey. All companies in our sample, therefore, may have been equally affected by lag problems.

The high fraction of explained variance of the construct for corporate success in electronic commerce in our model must also be reviewed critically. It is important to note that it is not exclusively accounted for by the exogenous constructs in our model, but that (at least parts of) the same variance can also be explained by other influential factors, i.e. competing constructs. We did not use any controls for these since our model focuses on the effectiveness of ECCRM as a singular concept.

6. Conclusion

6.1. Suggestions for Further Research

Although our study produces some useful insights, it leaves a number of issues open for future empirical research. Some suggestions are as follows:

1. The survey should be repeated in a similar manner in order to eliminate possible lag problems and assess how the identified interrelations change with time, as the integrated business concept ECCRM and the market environment mature.
2. It should be investigated whether the findings vary in different markets or industries.
3. Data aggregation and analysis in ECCRM implementations, as well as how the knowledge that companies have gained about their customers translates into action, should be studied in more detail and researchers should attempt to provide more objective, comparable, and quantitative measures.
4. Finally, one more issue for future research should be the role of ECCRM as an enabler for other integrated electronic commerce concepts, such as one-to-one-marketing and mass customization.

6.2. Managerial Implications

Companies' ECCRM-capability, which we have defined as companies' knowledge about their customers and their ability to serve their customers based on that knowledge, has proved to be a general and key success factor in electronic commerce. While it undoubtedly pays off to have a high degree of customer orientation in electronic commerce, the question whether the organizational effort for implementing ECCRM will also pay off or not cannot be answered categorically, but must be decided in every individual case.

Therefore, before engaging in any ECCRM implementation project, executives should conduct a thorough self-assessment of their respective company, its market environment, and, especially, its ECCRM-capability. When assessing the ECCRM-capability of one's company, it is helpful to determine the extent to which one's company can categorize its important customers or the extent to which it can provide efficient individual service to its customers based on the customer data it has obtained.

During the self-assessment process, decision makers should also explicitly consider the option not to implement ECCRM. Thereby, they might save their respective company a major investment, which is a typical ECCRM project requires, for achieving a degree of customer orientation in electronic commerce which it already has or for which there is no business need. Furthermore, integrating the concept of ECCRM implies operating on customers' personal data and profiles. Customers, however, especially consumers, can be quite anxious about giving away their personal information, and they can get very upset in case they feel that it has been abused, which often results in the loss of their business. Therefore, by opting against ECCRM, decision makers can avoid the risk that the customer relationships of their respective company actually deteriorate, that legal issues are raised, or that consumer protests arise against it.

If executives decide in favor of introducing ECCRM, they should build up managerial competence in planning and implementing ECCRM in order to increase their companies' ECCRM-capability, although this effect seems to require a certain experience on the Web.

Finally, executives of small companies or companies operating in the B2C segment should pay special attention to the ECCRM concept and related issues, since the latter have found to be particular business critical for small and B2C companies. This means that ECCRM-capability has a stronger influence on the success of these companies in electronic commerce than it has on the success of other companies in electronic commerce. Further, by deciding against a dedicated ECCRM implementation, small and B2C companies can increase their success in electronic commerce more than other types of companies. On the other hand, it is only for small and B2C companies that the learning process for building up managerial competence in planning and implementing ECCRM results in a negative direct impact on success in electronic commerce.

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REFERENCES

Abela, A. V. & Sacconaghi Jr., A. M. (1997). Value exchange: The secret of building customer relationships online. McKinsey Quarterly, 1997 (2), 216-219.

Adams, J. (2000). The hidden opportunity of e-commerce: e-CRM. Future Banker, 4 (11), 41.

Amit, R. & Zott, C. (2001). Value creation in e-business. Strategic Management Journal, 22, 493-520.

AMR Research (2002). CRM: Inflicting Pain or Profit. Report, available through: http://www.amrresearch.com, accessed September 15, 2003.

Arbuckle, J. L. & Wothke, W. (1999). AMOS 4.0 user's guide. Chicago: Small Waters Corporation.

Bagozzi, R. P. & Yi, Y. (1981). On the Evaluation of Structural Equation Models. Journal of the Academy of Marketing Science, 16, 1, 74-94.

Bentler, P. M. & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin, 88, 588-606.

Böing, C. (2001). Erfolgsfaktoren im Business-to-Consumer-E-Commerce [Success Factors in Business-to-Consumer-E-Commerce]. Wiesbaden, Germany: Gabler Verlag.

Bollen, K. A. (1989). Structural Equations with Latent Variables. New York, John Wiley & Sons.

Breitenbach, C. S. & Van Doren, D. C. (1998). Value-added marketing in the digital domain: Enhancing the utility of the Internet. Journal of Consumer Marketing, 15 (6), 558.

Chung, W. & Paynter, J. (2002). Privacy Issues on the Internet. Proceedings of the 35th Hawaii International Conference on System Sciences, Hawaii.

Cohen, P., Cohen, J., Teresi, J., Marchi, M., & Velez, C.N. (1990). Problems in the measurement of latent variables in structural equations causal models. Applied Psychological Measurement, 14, (2),183-196.

Culnan, M. J. (1993). "How did they get my name?": An Exploratory Investigation of Consumer Attitudes Toward Secondary Information Use. MIS Quarterly, 17 (3), 341-363.

Davis, R. (2002). The Wizard of Oz in CRM-land: CRM's need for business process management. Information Systems Management, 19 (4), 43-48.

Fornell, C. & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18, 39-50.

Forrester Research (2002). Forrester Research Predicts Growth For Customer Relationship Management (CRM) Market Through 2007. Press release available through: http://www.forrester.com, accessed September 15, 2003.

Forrester Research (2003). CRM Status: Satisfaction Rate Approaches 75%. Research brief available through: http://www.forrester.com, accessed September 15, 2003.

Gartner (2003). Building Business Benefits From CRM: How to Design the Strategy, Processes and Architectures to Succeed. Report, available through: http://www.gartner.com, accessed September 15, 2003.

Gefen, D. & Ridings, C. M. (2002). Implementation team responsiveness and user evaluation of customer relationship management: A quasi-experimental design study of social exchange theory. Journal of Management Information Systems, 19 (1), 47-69.

Holden, J. (2001). CRM shouldn't hurt. Sales & Marketing Management, 153 (2), 29-30.

Jutla, D., Craig, J., & Bodorik, P. (2001). Enabling and measuring electronic customer relationship management readiness. Proceedings of the 34th Hawaii International Conference on System Sciences, Hawaii.

Kannan, V. R., Tan, K. C., Handfield, R. B., & Ghosh, S. (1998). Managing competition, quality, customer relations, and the supply base, and its impact on firm performance. In K. B. P. (Coordinator), Proceedings of the 29th Annual Meeting of the Decision Sciences Institute, Las Vegas, Nevada, 1259-1261.

Kotorov, R. (2002). Ubiquitous organization: organizational design for e-CRM. Business Process Management Journal, 8(3), 218-232.

Kuk, G. & Yeung, F.T. (2002). Interactivity in E-Commerce. Quarterly Journal of Electronic Commerce, 3 (3), 223-234.

Kundisch, D., Wolfersberger, P., Calaminus, D., & Kloepfer, E. (2001). Enabling eCCRM: Content model and management for financial services. Proceedings of the 34th Hawaii International Conference on System Sciences, Hawaii.

Madeja, N. & Schoder, D. (2003). Impact of electronic commerce customer relationship management on corporate success – Results from an empirical investigation. Proceedings of the 36th Hawaii International Conference on System Sciences, Big Island, Hawaii.

Malis, E. (2000). The CRM buzz. Manufacturing Systems, May 2000, 54.

Marchany, R. C. & Tront, J. G. (2002). E-Commerce Security Issues. Proceedings of the 35th Hawaii International Conference on System Sciences, Hawaii.

Meta Group (2000). Meta Group Sees Continued Strong Growth for Customer Relationship Management (CRM) Initiatives: Projects a 50% Annual Growth Rate for Global CRM Market. Press release available through: http://www.metagroup.com, accessed September 15, 2003.

Nunnally, J. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill.

Orr, J. (2001). Strategic options for CRM: Which way off the roundabout? Vital Speeches of the Day, 67 (20), 615-618.

Romano, N. C., Jr. & Fjermestad, J. (2001a). Introduction to the special section: Electronic commerce customer relationship management (ECCRM). International Journal of Electronic Commerce, 6 (2), 7 f.

Romano, N. C., Jr.& Fjermestad, J. (2001b). Electronic commerce customer relationship management: An assessment of research. International Journal of Electronic Commerce, 6 (2), 61-113.

Seybold, P. B. (2001). The customer revolution. New York: Crown Publishers.

Strauß, R. & Schoder, D. (2000). e-Reality 2000 – Electronic Commerce von der Vision zur Realität: Status, Entwicklung, Problemstellungen, Erfolgsfaktoren sowie Management-Implikationen des Electronic Commerce [e-Reality 2000 – Electronic Commerce from Vision to Reality: Status, Development, Problems, Success Factors, and Management Implications of Electronic Commerce]. Consulting Partner Group, Frankfurt a.M., Frankfurt, Germany. ISBN 3-00-006870-8. (Subsequent survey to the "Electronic Commerce Enquête 1997/98")

Strauß, R.; Schoder, D. (2002): eReality – Das E-Business Bausteinkonzept. Strategien und Erfolgsfaktoren für das E-Business-Management [e-Reality 2000 – A Modular Concept for E-Business Management]. F.A.Z.-Institut für Management-, Markt- und Medieninformationen, Frankfurt a. M, Frankfurt, Germany. ISBN 3-934191-49-5.

Tan, X., Yen, D. C., & Fang, X. (2002). Internet integrated customer relationship management – A key success factor for companies in the e-commerce arena. Journal of Computer Information Systems, Spring 2002, 42, 77-86.

Wilson, H., Daniel, E., & McDonald, M. (2002). Factors for success in customer relationship management (CRM) systems. Journal of Marketing Management, 18 (1/2), 193-219.

Yu, L. (2001). Successful Customer-Relationship Management. MIT Sloan Management Review, Summer 2001, 42 (4), 18 f.