A BUSINESS INTELLIGENCE SOLUTION FOR ASSESSING CUSTOMER INTERACTION, CROSS-SELLING, AND CUSTOMIZATION IN A CUSTOMER INTIMACY CONTEXT

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A BUSINESS INTELLIGENCE SOLUTION FOR ASSESSING CUSTOMER INTERACTION, CROSS-SELLING, AND CUSTOMIZATION IN A CUSTOMER INTIMACY CONTEXT

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Abstract

The ability to capture customer needs and to tailor the provided solutions accordingly, also defined as customer intimacy, has become a significant success factor in the B2B space - in particular for increasingly "servitizing" businesses. Providers aim at achieving competitive advantages, such as cross-selling and customization by leveraging customer relationships and customer knowledge. However, the management of customer intimacy lacks analytical support. Many organizations struggle with measuring and proactively managing the degree of customer intimacy established with their customers. This work aims to remedy this issue by providing a business intelligence solution to assess three specific aspects of a customer intimacy strategy: customer interaction, customization, and cross-selling. The proposed solution CI Analytics leverages customer related data which is already available in the provider’s information system to derive customer intimacy metrics. These metrics are subsequently used to determine the investments of the provider in term of customer interaction time at both the employee and organization levels, as well as to evaluate the achieved degrees of customization and of cross-selling. This solution has been prototypically implemented and evaluated in an enterprise setting. It enables organizations to continuously measure the success of pursuing a customer intimacy strategy with their different customers.

Keywords: Customer Intimacy, Customer Relationship Management, Business Intelligence, Customer Interaction, Cross-Selling, Customization, Business to Business
1 Introduction

A recent survey conducted in 2010 with 1500 chief executive officers worldwide confirms that today “successful CEOs make customer intimacy their number-one priority” (IBM Institute for Business Value, 2010, p.9). Customer intimacy has gained momentum over the past years as it is perceived as a means to develop a sustainable business strategy in mature markets such as Europe and the United States which are characterized by limited growth, fierce competition, and demanding customers. Tracey and Wiersema (1993, p.87) defined customer intimacy as the ability “to continually tailor and shape products and services in order to fit an increasingly fine definition of the customer” and argued that this type of strategy is a successful means for an organization to become a market leader. This growing importance of customer intimacy is driven by a fast development of the service industry, higher expectations on the demand side, and a shift in the role of the customer from passive value receiver to active value co-creator (Elmuti, 2009; Vargo, 2004a).

The choice to pursue a customer intimacy strategy directly impacts the IT operations of the organization. However, IT systems have so far been adopted with a focus on cost efficiency, while “the role of customer intimacy has been under-investigated” from the IT perspective (Liang, 2009, p.1). In particular, the measurement and management of customer intimacy still lacks analytical support. Looking at relationship performance indicators, the customer contribution margin is the most basic conception for assessing the profitability of business relationships (Wengler, 2006a). An empirical analysis performed in 2006 reveals that only 30% of the surveyed organizations take this parameter into account, and 80% of them solely use transaction volumes in order to rate their customers (Wengler, 2006b). Even though customer relationship management (CRM) systems are well established today (Sackmann, 2008; Reinartz, 2004), they do not yet provide the appropriate support for the implementation of a customer intimacy strategy and a large number of studies show that several CRM projects fail to meet their objectives (Elmuti, 2009). Many organizations, thus, still struggle with measuring and proactively managing the degree of customer intimacy established with their customers.

This work aims to remedy this issue by providing a business intelligence solution to assess and monitor three specific aspects of a customer intimacy strategy: customer interaction, customization, and cross-selling. Customer intimacy requires from the provider to acquire detailed knowledge of individual customer needs and wants (Hoekstra, 1999; Batt, 2004) as well as to establish high quality relationships with the customer. In a B2B context, customer knowledge and relationships are mostly derived from social interaction between the provider and the customer employees (Grönnroos, 2004; Gwinner et al., 2005; Payne et al., 2007). Customer interaction is, thus, a key aspect of a customer intimacy strategy and, therefore, needs to be assessed. In return, the firm adopting a customer intimacy strategy gains unique forms of competitive advantage. Particularly, customer intimacy provides the ability to customize the solution to customer needs, thereby improving the value proposition and having it exceed those of competitors, as well as the ability to sell more related products or services to the customer and, thus, to achieve cross-selling. It is, therefore, essential to assess the degrees of customization and of cross-selling in order to determine the business impact of the customer intimacy strategy.

The proposed solution CI Analytics leverages customer related data which is already available in the provider’s information system (such as interaction, projects, and sales records) to derive customer intimacy metrics. These metrics are subsequently used to determine the investments of the provider in term of customer interaction time at both the employee and organization levels, as well as to evaluate the degrees of customization and of cross-selling resulting from the customer intimacy strategy. Other customer intimacy related business impacts will be investigated in future research. This contribution is noteworthy along several lines: while most approaches for assessing the effectiveness of customer intimacy rely on one-time empirical survey methods, the proposed solution CI Analytics provides an automated and continuous assessment of the degree of customer intimacy established with different
customers over time. This assessment is easily implementable as it leverages already available operational data in the provider’s information systems. CI Analytics also allows an organization to benchmark the effectiveness of its customer intimacy strategy with different customers and, thus, supports this organization with regard to its customer investment decisions.

The solution CI Analytics has been prototypically implemented in order to validate the feasibility of the proposed customer intimacy assessment. The resulting application allows different users in the provider organization to visualize in real time the time spent by provider employees in interacting with customer employees in order to acquire customer knowledge and to establish relationships. In addition, this software graphically represents the degrees of customization and of cross-selling for specific customers and for specific time frames by means of dedicated customer intimacy performance indicators. For validation purposes, CI Analytics has been evaluated in an enterprise setting with real data from an IT software and service provider.

The remainder of this paper is structured as follows. Section 2 provides an overview of the related work with regard to the assessment of customer intimacy. Section 3 introduces the CI Analytics solution and elaborates on the proposed model for assessing customer intimacy out of multiple data sources. Section 4 subsequently presents the implemented prototype of the solution CI Analytics to demonstrate the feasibility of the proposed customer intimacy assessment, and details the results of a case study in which the customer intimacy metrics have been calculated and interpreted upon real data. Finally, section 5 concludes this work with an outline of our planned future research activities.

2 Related Work

Several concepts which are related to our approach of assessing key components of customer intimacy have been proposed in past literature, such as customer intimacy measurement, customer lifetime value and customer profitability, balanced scorecard, and CRM scorecard. However, none of these approaches provides an automated assessment of customer intimacy.

Related approaches for assessing customer intimacy are found in literature on the assessment of customer intimacy, which has been reviewed in detail in Habryn et al. (2010). However, the operationalization of the introduced approaches is not thoroughly described and has not been implemented and tested in practice yet. Additional related concepts are customer profitability analysis and customer lifetime value analysis such as Mulhern (1999). However, we did not find any non-empirical approach for assessing customer profitability or customer lifetime value, which takes the interaction between customer and provider employees into account. Another related concept is the balanced scorecard approach, which complements financial measures of past performance with measures of the drivers of future performance (Kaplan, 2005). The balanced scorecard approach and this work are based on the same idea: traditional financial measurements lack some indicators and, therefore, need to be complemented with further metrics. Even though some approaches exist that supplement balanced scorecards in order to fit to the specific characteristics of customer intimacy, such as introduced in Niven (2002), we did not find any applied implementation for such approaches. Kim (2009) suggests a performance measurement framework called CRM scorecard to diagnose and assess a firm’s CRM practice. Although this approach is closely related to our approach, it is not adjusted for monitoring the key aspects of customer intimacy, such as cross-selling and customization.

We conclude from this literature review that there is, as of today, no means for organizations pursuing a customer intimacy strategy to automatically assess the competitive advantages achieved through a customer intimacy strategy.

3 Customer Intimacy Assessment Model

This section elaborates on the design of our model for assessing the amount of interaction, and two business impacts of customer intimacy, namely cross-selling and customization.
3.1 Model Overview

Figure 1 illustrates the main components of the proposed model. The three layers of this model, which are detailed in the next paragraphs, are customer intimacy, customer intimacy information, and customer intimacy data source.

**Layer 1: Customer Intimacy**

The first layer, called *Customer Intimacy*, reflects the results of the breakdown analysis of the concept of customer intimacy in meaningful components based on a literature review. In this layer, customer intimacy is decomposed into two parts, the *acquired* customer intimacy and the *leveraged* customer intimacy. The *acquired* customer intimacy reflects the acquired knowledge of, and established relationships with, customers. The *acquired* customer intimacy enables the provider to adapt the proposed solution to individual customer needs. In a B2B context, these knowledge and relationships are mostly obtained through social interaction between customer and provider employees (Grönroos, 2004; Gwinner et al., 2005; Payne et al., 2007). The *leveraged* customer intimacy components represent the benefits and competitive advantages achieved by effectively using the *acquired* customer intimacy. This contribution focuses in particular on the two previously mentioned benefits of customization and cross-selling. A customer intimacy strategy is only successful if the provider is able to achieve both the *acquired* and *leveraged* customer intimacy. Our model, thus, considers the assessment of these two parts. Within this contribution, we focus on the extent to which the provider’s interaction-based investments with regard to customer relationships and customer knowledge lead to achieving customization and cross-selling.

**Layer 2: Customer Intimacy Information**

Most marketing research relies on the application of empirical methods. However, these empirical methods reveal weaknesses and, therefore, have been criticized in marketing literature (Gummesson, 2002). In contrast with such empirical methods, our approach proposes to calculate customer intimacy information out of operational data which is readily available in the provider’s information system. Thus, the *Customer Intimacy Information* layer consists of two parts: (i) a social network graph, representing the amount of interaction between provider and customer employees, and (ii) a set of...
customer intimacy metrics reflecting the amount of interaction, as well as the degrees of cross-selling and of customization. The actual metrics which have been defined for assessing the components pertaining to this layer are based upon literature and are presented in the next parts of this section.

**Layer 3: Customer Intimacy Data Sources**

The layer *Customer Intimacy Data Sources* holds the underlying raw data, the “evidence of customer intimacy”. Two main types of sources can be distinguished. (i) Customer interaction channels consist of the different means used by the provider and the customer in order to exchange information, to dialog and to jointly perform activities, such as emails, phone calls, letters and also face-to-face meetings. (ii) Customer information sources contain additional relevant data for the calculation of the customer intimacy components such as the project databases, the CRM system or the accounting system.

In summary, the concept of customer intimacy is decomposed in meaningful and quantifiable components in the first layer of the model. These components are analytically assessed by means of customer intimacy metrics which are defined in the second layer of the model. These metrics are calculated upon operational data contained in the sources proposed in the third layer of the model.

### 3.2 Interaction Assessment

The interaction process occurring between the provider and the customer is the core of the relationship marketing process (Grönroos, 2004) and it enables the provider to acquire customer knowledge (Gwinner et al., 2005). A key aspect of this contribution is, therefore, to estimate the amount of interaction between the provider and the customer. Several interaction based patterns have already been associated to relationships and knowledge. Nezlek (2003) already investigated interaction quantity as a potential indicator of relationships. Noorderhaven & Harzing (2009) confirmed that intensive social interactions lead to knowledge creation.

Since it is not possible to estimate ex-ante the relative importance of the different customer interaction channels, we propose to aggregate the overall interaction quantity which we call *Customer Interaction Time* (CIT) as the time spent communicating and interacting with the customer across all different channels. In order to calculate this CIT value, first, the different interactions that belong to the relationships are evaluated in order to calculate their respective contribution to the overall CIT value. Then, these values are summed along each different interaction channel. Finally, the overall CIT value is aggregated as the total customer interaction time across all interaction channels. For instance, if a meeting lasting 2 hours is followed by two phone calls which last respectively 10 and 20 minutes, the overall customer interaction time is equal to 2 hours and 30 minutes. As opposed to phone calls and meetings, the CIT value for emails and letters cannot be directly measured. In this model, as a first approximation, we assume that each email has a constant CIT value of $d_{email}$ and each letter has a constant CIT value of $d_{letter}$. Both variables can be configured individually by the service provider. In future research, these two constants could be replaced by functions which take into account multiple parameters (such as the length of the emails and letters or the roles of the senders and receivers).

An important parameter which determines the quality of the communication and interaction between two individuals is the number of participants to the different interactions in which they are involved. Indeed, if a provider employee has a one-hour meeting with one single customer employee, he is more likely to obtain knowledge about this person and to establish a relationship with this person than if he meets this person in a larger event with several people involved. In a similar way, if an email is sent by a provider employee to one person, it certainly contains more personalized information than if this email is sent to all employees of the customer organization. Thus, our calculation of the customer interaction time takes into account the number of participants to each interaction.

In order to define the CIT metric within this model, further mathematical formalization is required. In this model, the relationship is analyzed over a time period of duration $T$ at both the employee and organization levels. $CIT_p^e(T)$ represents the overall interaction time between the employee $p$ of
provider company \( P \) and the employee \( c \) of customer company \( C \) within the time period \( T \). \( CIT_{p}^{c}(T) \) is calculated as the sum of the interactions that occurred across the four different channels between these two employees within the time period \( T \). With \( H = \{ \text{meeting; phone-call; email; letter} \} \) representing the set of interaction channels available to the provider employee \( p \) and the customer employee \( c \), \( K_{h}(T) \) representing the set of interactions using the interaction channel \( h \) \( (h \in H) \) in period \( T \), \( d_{j} \) representing the duration of the interaction \( j \) (it is equal to \( d_{\text{email}} \) or \( d_{\text{letter}} \) in case of an email or letter), and \( p_{j} \) representing the number of participants in the interaction \( j \), then \( CIT_{p,h}^{c}(T) \), which is the customer interaction time across the channel \( h \) between the employees \( p \) and \( c \) for the time period \( T \), is calculated as in equation 1. \( CIT_{p}^{c}(T) \), which reflects the total customer interaction time between \( p \) and \( c \) for the time period \( T \) is subsequently calculated as in equation 2. Finally, at the organizational level, \( CIT_{P}^{C}(T) \) which is the total interaction time within a time period \( T \) between a provider organization \( P \) and the customer organization \( C \) is calculated as the sum of all interactions among provider and customer employees, as depicted in equation 3.

\[
CIT_{p,h}^{c}(T) = \sum_{j \in K_{h}^{p}} d_{j} / p_{j} \quad \text{(Equation 1)}
\]

\[
CIT_{p}^{c}(T) = \sum_{h \in H} CIT_{p,h}^{c}(T) \quad \text{(Equation 2)}
\]

\[
CIT_{P}^{C}(T) = \sum_{p \in P} CIT_{p}^{c}(T) \quad \text{(Equation 3)}
\]

### 3.3 Cross-Selling Assessment

Within this contribution, cross-selling is the first considered benefit derived from pursuing a customer intimacy strategy. Kamakura et al. (1991) explain that cross-selling aims at increasing the number of different products and services sold to the customer and Malms and Schmitz (2011, p.255) suggest a customer intimacy aligned definition of cross-selling: “an offer of customized solutions or the provision of a full assortment of products and services.” Akura and Srinivasan (2005, p.1007) confirm the intricate connection between customer intimacy and cross-selling as they argue that “successful cross-selling requires customer intimacy and detailed information on customer preferences.”

Cross-selling is an important concept in the context of customer intimacy for the following three reasons. First, cross-selling improves the profitability of the customer investments as the customer acquisition costs are distributed on multiple products and services belonging to different categories. In addition, these costs are further reduced for any subsequent component added to the solution provided to the customer. Second, cross-selling increases switching costs, thereby extending the customer lifetime value and increasing the customer loyalty (Kamakura et al., 1991). The more services the customer uses, the higher the costs for switching to another provider and the higher the customer loyalty and tenure (Kamakura et al., 2003). Third, cross-selling extends the customer related knowledge acquired by the provider (Kamakura et al., 2003). As the number of products and services used by the customer increases, the provider gains new opportunity to analyze the customer preferences and buying behavior. This allows him to satisfy the customer needs and wishes more effectively than other competitors and enables him to precisely tailor his offering to the customer requirements.

Cross-selling has already been recognized as a key performance indicator in various industries such as in the finance sector (Kamakura et al., 1991), and different approaches have been proposed in order to assess cross-selling achievements from the provider perspective. Nash and Sterna-Karwat (1996) propose a methodology to assess cross-selling efficiency based on financial accounts details. Other performance indicators, such as “number of products sold divided by number of customers purchasing a product” focus on cross-selling performance of a whole company (Bauer, 2004).

Inspired by the approach of Malms and Schmitz (2011, p.258) who argue that “cross-selling success is defined as the degree to which the firm exploits customer’s full cross-selling potential,” we propose a
revenue-based metric called Cross-Selling Revenue Share in order to determine the cross-selling performance. Since cross-selling refers to complementing the initial offering to the customer with new products and services, this metric is based on the ratio between the revenue generated in a certain time period by products and services that were already sold to the customer in the past and revenue generated in the same time period by products and services that the customer purchases for the first time. More formally, considering the time period \( T \), \( I_T \) represents the set of products and services sold to the customer \( C \) for the first time in the time period \( T \), and \( J_T \) the set of products and services sold to \( C \) in the time period \( T \) as well as prior to the beginning of \( T \). If \( R(I_T) \) and \( R(J_T) \) represent the revenues generated by \( I_T \) and \( J_T \), the Cross-Selling Revenue Share (CSRS) can be calculated for the time period \( T \) as in equation 4.

\[
CSRS_T^C(T) = \frac{R(I_T)}{R(I_T) + R(J_T)} \quad (Equation \ 4)
\]

### 3.4 Customization Assessment

Customization is the second customer intimacy benefit considered in this contribution. Customer intimacy driven organizations, with their objective to “tailor and shape products and services to fit an increasingly fine definition of the customer” (Treacy and Wiersema, 1993, p.87) inherently rely on customization strategies which “aim at providing customers with individually tailored products and services” (Gwinner et al., 2005, p.131). Customization is particularly important in the B2B context because it is closely related to the servitization transformation that has occurred over the past decades. Servitization refers to a business model shift from selling products to selling “customer-focused combinations of goods, services, support, self-service and knowledge” and is, as a matter of fact, a form of customization (Vandermerwe, 1988, p.314).

Several analyses in past literature have confirmed the importance of customization in order to create a competitive advantage and to improve the value proposition. Fornell et al. (1996, p.8) demonstrated with their American customer satisfaction index that customization, which they defined as “the degree to which the firm’s offering is customized to fit heterogeneous customer needs” has a more significant impact on customer satisfaction than reliability. Richards and Jones (2008, p.126), in an analysis aiming at finding the value drivers of CRM, observed that “increased customization of products and services is positively related to brand equity and relationship equity in the maintenance stage.” Thus, customization increases the provider’s value from the customer’s perspective. Finally, Vargo and Lusch (2004b, p.326) confirmed the importance of customization in contrast to standardization as they state that “the normative marketing goal should be customization, rather than standardization.”

In contrast to mass customization (Da Silveira, 2001), customization in a customer intimacy context refers to the adaptation of the solution to the specific needs and requirements of distinct customers. Thus, past research related to the assessment of mass customization by means of a cost estimation (Tu, 2007) or by evaluating its degree (Ashok, 2004) are not suited in this contribution. In line with the service customization through employee adaptiveness model of Gwinner (2005), this work focuses on customization achieved by provider employees, such as the completion of individual projects and the adaptation of existing solutions. Our hypothesis is that it is possible to determine the revenue derived by such projects and to compare it to the revenue derived from standard products and services such as software license fees. We therefore propose the metric Customization Revenue Share (\( CRS_T^C(T) \)) in order to assess the degree of customization achieved by a provider \( P \) with the customer \( C \) during the time period \( T \). This metric represents the share of revenue generated with customization projects within \( T \). More formally, \( H_T \) represents the set of standard products and services sold to the customer \( C \) in \( T \), and \( K_T \) represents the set of customized services sold to the customer \( C \) in \( T \). If \( R(K_T) \) and \( R(H_T) \) reflect the revenue generated by \( H_T \) and \( K_T \) within the time period \( T \) within the time period \( T \), then the Customization Revenue Share metric \( CRS_T^C(T) \) can be calculated as in equation 5.

\[
CRS_T^C(T) = \frac{R(K_T)}{R(K_T) + R(H_T)} \quad (Equation \ 5)
\]
4 Evaluation

This section introduces the software which has been conceived in order to perform the metric calculation and subsequently presents the results of an illustrative case study in which the metrics have been calculated and interpreted.

4.1 Model Implementation

This section elaborates on the software application of the solution CI Analytics that was conceived, prototypically implemented, and validated in order to perform the assessment and monitoring of customer intimacy. The architecture of this application is illustrated in figure 2. First, we collected functional and non-functional requirements and investigated relevant operational data of interest in the provider’s information system. The relevant data for this work are:

- interaction data consisting of entries for emails, phone calls, meetings, and letters. The data is entered either manually by the employees, or semi-automatically via email-client-plugins, telephone system integration, and groupware integration.
- invoice data derived from the accounting database. Each invoice line item represents the revenue generated by selling a specific product or service to the customer.

We subsequently designed the target data scheme for the data warehouse (CI Data Warehouse) as well as the corresponding extract, transform, and load process (CI ETL) to populate the data warehouse out of operational data. Third, web services (CI Services) accessing the data warehouse have been conceived and implemented for all metrics proposed in section 3. Finally, a web based graphical user interface (CI Dashboard) which is illustrated in figure 3 has been created.

![Architecture of CI Analytics](image)

- **CI ETL** first extracts interaction and revenue data from operational databases. Then, it transforms and aggregates it upon a denormalized data schema which is optimized for fast reading operations. Finally, it stores the data into the data warehouse called CI Data Warehouse.
- **CI Data Warehouse** stores operational data of interest in a database schema consisting of fact and dimension tables. In order to enable the customer intimacy assessment, the following two processes involving the customer have been analyzed: (i) the interaction process between the provider and customer employees; (ii) the revenue stream generated by the provider with the customer. As a result, the conceived CI Data Warehouse contains the two following fact tables:
  1. Customer Interaction Time (CIT): time spent on interacting with the customer. A fact record is created for each interaction event, such as a phone call, email, meeting, or letter.
  2. Customer Revenue Amount (CRA): revenue that is received from the customer. A fact record is created for each distinct sale of a product or service, which has been extracted from the invoices of the accounting database. Based on the type of product or service, the purchases are categorized in standard revenue such as software license revenue and customization revenue such as IT consulting.
As depicted on the right hand side of figure 2, four dimension tables surround the CIT fact table (Date/Time, Customer Employee, Provider Employee, and Interaction Channel) and three dimension tables surround the CRA fact table (Date/Time, Customer Company, Revenue Source). This dimensional data enables a precise filtering and aggregation of the customer interaction time and customer revenue amount facts, thereby increasing the flexibility of the metrics assessment.

- **CI Services** represent the set of services enabling the calculation of the proposed customer intimacy metrics Customer Interaction Time, Cross-Selling Revenue Share and Customization Revenue Share. The CI Services translate service calls into corresponding data warehouse queries, invoke the data warehouse, and return the result in a standardized XML format. These services have been implemented with a lightweight RESTful web service interface. The metric Customer Interaction Time is calculated by aggregating the relevant CIT facts. The metric Cross-Selling Revenue Share (CSRS) is calculated using the CRA fact table. The application compares each invoice line item with invoice line items of invoices issued before the beginning of time period $T$. For calculating CSRS, $T$ excludes the initial purchase of the customer. The metric, thus, expresses the ability of the service provider to generate additional revenue with the customer after the customer’s initial purchase. The metric Customization Revenue Share (CRS) is calculated by comparing the revenue based on their category (standardized or customization revenue).

- **CI Dashboard**, which is depicted in figure 3, is the graphical user interface that enables users to access information on the calculated metrics. It is based on standard web technologies and is accessible with a web browser. The CI Dashboard allows entering specific parameters such as customer name and time period, and it calls the CI Services with these parameters as input. The CI Dashboard subsequently renders the customer intimacy information based on returned data from CI Services. On the left hand side, the CI Dashboard displays the social network formed by the customer and provider employees. Each node represents an employee. An edge between two nodes indicates that some interaction occurred between the two employees, and the weight of the edge is calculated using the Customer Interaction Time metric proposed in section 3. On the right hand side, the CI Dashboard presents the values of the proposed customer intimacy metrics Customer Interaction Time, as well as Cross-Selling Revenue Share and Customization Revenue Share.

![Figure 3. Screenshot of CI Dashboard](image)

### 4.2 Customer Intimacy Assessment Case Study

This section presents the results of an illustrative case study in which the customer intimacy metrics were investigated in an enterprise setting including an IT software and service provider and three of its
customers. This case study validates the feasibility of the calculation of the proposed metrics as well as demonstrates how a provider can use the metrics in order to benchmark its customers.

The metrics were calculated using the software described in section 4.1 upon historical data available in the database of the provider’s information system. The considered time period $T$ was set to the entire time span of the customer relationship which is equal to three years for all three customers. The parameters $d_{email}$ and $d_{letter}$ were set to 10 minutes. The results are listed in table 1.

<table>
<thead>
<tr>
<th>Customer</th>
<th>Customer Interaction Time (CIT)</th>
<th>Cross-Selling Revenue Share (CSRS)</th>
<th>Customization Revenue Share (CRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>188.41</td>
<td>84.50%</td>
<td>52.56%</td>
</tr>
<tr>
<td>C2</td>
<td>177.66</td>
<td>48.05%</td>
<td>49.81%</td>
</tr>
<tr>
<td>C3</td>
<td>109.06</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 1. Case Study Results

The case study demonstrates that the provider achieved different customer intimacy results with these three customers:

- **C1** exhibits a high CIT value as well as high CSRS and CRS ratios. CSRS is very high; more than 80% of the customer revenue after the initial purchase was generated through cross-selling. Furthermore, more than half of the total customer revenue was generated through customization (CRS= 52.56%). This indicates that the provider was able to derive some competitive advantages from the interactions with the customer C1. The customer seems to positively react to a customer intimacy strategy and, thus, the investment in the relationship should be maintained or strengthened for achieving further competitive advantages with this customer.

- **C2** shows a CIT value which is slightly lower than the CIT value for C1. The provider was able to derive some benefits from the interactions with this customer: nearly half of the revenue after the initial purchase was generated through cross-selling (CRS=49.81%) and half of the revenue was generated through customization (CSRS=48.05%). These results, even though weaker than those obtained with C1, shows that the customer intimacy strategy seems beneficial with this customer.

- **C3** exhibits a significantly lower CIT value than for C1 and C2 as well as CSRS and CSR values equal to null. This indicates that the provider was not able to achieve any competitive advantages through cross-selling or customization over the past three years. This indicator may be interpreted in two ways: either the customer does not react to the customer intimacy strategy and, therefore, investments in the relationship should be minimized, or the provider did not invest enough in the customer and, thus, was not able to achieve competitive advantages. In the latter case, the provider should interact more with the customer in the future in order to increase the cross-selling and customization ratios.

This study shows that the three proposed metrics can effectively supplement traditional financial measures for assessing the business impact of a customer intimacy strategy with distinct customers. Even though the study contains only three cases, the obtained results are in line with the findings of Palmatier et al. (2006, p.477), who stated that “investment in social relationship marketing pay off.” Our future research will further investigate the relationship between these metrics as well as the actual utilization of these metrics inside a provider organization by means of statistical analysis.

## 5 Conclusion and Outlook

In this paper, we propose an innovative approach for assessing and monitoring three key aspects of customer intimacy: the amount of interaction between the provider and the customer as well as two customer intimacy business impacts, namely the achieved degree of cross-selling and of customization. This assessment relies on a thorough literature review of the related concepts and applies business intelligence technology to propose accurate, real-time, and easily operationalized customer intimacy performance indicators. The proposed solution has been prototypically implemented in order to validate the feasibility of the assessment. This software allows different users
in the provider organization to visualize in real time the investments performed by the provider employees in terms of interaction time. In addition, it graphically represents the business impact of these interactions for specific customers and for specific time periods. This solution has been evaluated in an enterprise setting with real data from an IT software and service provider. This evaluation confirms the relevance of proposed metrics for benchmarking customers with regard to the success of the customer intimacy strategy.

The proposed contribution lays the foundation for our future research. This contribution focuses on the individual assessment of interaction, cross-selling, and customization. The business impact of a customer intimacy strategy, however, includes many other aspects such as increased customer participation or a reduction of the transaction costs. Our future research will, thus, focus on the analysis of these other components in order to provide a comprehensive customer intimacy assessment. Second, interactions have been analyzed in the scope of this contribution with a focus on quantity of interactions. Further research will investigate other metrics for assessing interactions, for instance focusing on interaction regularity and interaction channels. Third, this contribution provides the means to assess interaction, cross-selling, and customization, but it does not analyze the link between these components. Our future research will therefore investigate this relationship among the different customer intimacy components by means of statistical analysis and advanced business analytics methods. Finally, we plan to investigate how our approach can be used to identify patterns leading to a successful realization of a customer intimacy strategy. For instance, we plan to implement complex event processing functionalities in order identify specific patterns among interaction and activity events which critically impact the business activities. We also intend to enhance the proposed contribution with the capability to determine which customers are most likely to be responsive to the customer intimacy strategy, thereby providing additional key managerial implications.

References


