
Practitioner Article

Building the foundation for customer data quality in CRM systems for financial services firms

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ABSTRACT The digital revolution has led to firms with massive amounts of information. Thus, the storage, collection and appropriate use of such data is a major challenge for firms as they struggle to implement profitable integrated marketing communication strategies. Given this, the goal of our article is to analyze the types of customer-based data that organizations can collect to learn about their customers and determine methods by which the collection of such information can ensure higher data quality for use in Customer Relationship Management (CRM)-based systems. Our work also studies the relative value of each type of data in developing higher quality customer data and superior CRM systems. These data tell managers how to organize their priorities in terms of data learning activities to create the highest quality CRM data so that improved performance can ensue. Our findings show that capturing the results of personalized communications and detailed transactions of customer interactions will yield the highest results and perhaps should be the organization's focus.

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INTRODUCTION

Recent changes in the digital environment related to information storage, collection and dissemination have resulted in firms developing and maintaining databases with large quantities of customer information. As a consequence, companies are increasingly being confronted with massive amounts of data contained in widely disparate and often inconsistent databases. In fact, research indicates that marketing professionals will not use or will work around data repositories without trust in the underlying data quality.¹ Thus, the identification of processes that can establish systems to not only capture customer data and increase customer knowledge but also maintain the quality and consistency of the data after the fact is becoming a paramount business concern.

Firms need information, indexed across various data sources, to use in customer-driven applications, including in particular Customer Relationship Management (CRM) systems, technology-driven solutions that enable relationship marketing through the use of information. Despite this need, and although CRM has received increased coverage in both academic and popular press, few firms implement relational frameworks that provide a 360° view of their customers' transactional, psycho-demographic and behavioral profiles.² This research looks at the types of customer-based data that organizations can collect to learn about their customers and how the collection of such information can ensure higher data quality for use in CRM-based systems. Our study also looks at the relative value of each type of data in developing higher quality customer data and superior CRM systems.

More specifically, customer data quality is of utmost importance for businesses today, as firms attempt to merge multiple methods of communication together in integrated campaigns. Central to customer data quality in CRM systems is the need for ongoing

and accurate customer information both to manage campaigns and determine customer value. A customer interaction strategy based on sound customer data requires companies to organize and analyze every customer touchpoint so that the customer's value to the firm can be readily determined. This customer valuation, in turn, can allow firms to prevent excess expenditure geared at low-value customers, while targeting promotions and spending efforts toward the high lifetime value ones.

However, this multiple-messaging task is made even more difficult, as recent research indicates that the definition of customer value is domain and, indeed, firm specific. Further, firms must consider their valuation strategy in a situational context.³ These challenges add to the complexity of the data that must be stored and maintained. It seems that to achieve maximum benefit and economies of scale in their multiple communications, firms must develop and deploy strategic customer-driven tailored messaging, a goal that can only be achieved by first achieving data integrity.⁴

Extant literature demonstrates that the maintenance of high-quality data in general requires a methodology whereby companies cyclically audit and clean the data, as well as implement compliance measures for their data repositories.⁵ Therefore, marketing scholars and practitioners have an increasing need for research that enhances an understanding of methods to collect, store, analyze and utilize customer data for developing longitudinal customer-driven strategies.⁶ On a multinational scale, the problem is exacerbated by the fact that CRM methodologies and technologies have not been able to extract adequate performance metrics to demonstrate their effectiveness in the marketplace.⁷

One of the key transitions taking place in marketing today is the movement from a purely transactional view of marketing to a more relational one. This transition stems from the changes and abilities that database

and direct marketing can now offer in terms of the storage and retrieval of specific consumer information. That information serves as an ongoing repository of customer touchpoints and allows companies to send tailored messages and customized promotions to customers. However, that information can also be misused or underutilized when companies do not strategically implement a customer framework.

In light of this trend toward relevant messaging, research suggests that synergistic use of the customer data can only be accomplished by combining transactional and relational marketing capabilities. In effect, information technology can best be utilized to coordinate, combine and augment transactional with relational data, a process that can lead to better customer profiling and hence more targeted, effective and efficient customer communication strategies.⁸ As noted above, both academic research and practical implementation issues suggest that customer valuation efforts must take place in order to identify tiered customer relational approaches within organizations.⁹ However, there is sparse research concerning the use of intra-organizational processes, which can lead to higher quality data and hence better implementation of customer strategies through quality data in CRM systems.

Businesses are thus faced with two often disparate goals: first to identify and capture a high quantity of customer and shareholder knowledge, and second to handle the large quantity of data by keeping them clean, organized and relevant, that is, ensuring their quality. CRM strategy must become part of an overarching strategy for firms, entwined in the every process, including business strategy development, value creation, multichannel integration and performance assessment.¹⁰ These processes serve as both inputs and outputs to the actual CRM data repository, making them and their quality the backbone of business

strategy. Therefore, we approach the literature gap in this area by providing a model that explains how intra-organizational structures in firms, specifically frequency of data capture, can lead to increased customer data quality in CRM systems.

THEORETICAL FRAMEWORK

As CRM system capabilities and customer data quality in CRM systems are intangible resources, we look to the resource-based view (RBV) of the firm, to guide our research. The core concept of the RBV is that the firm's source of competitive advantage is organizational resources, which are difficult to imitate.¹¹ Although information itself, such as that contained in a CRM system, can be seen as a difficult-to-imitate resource that can lead to competitive advantage, ultimately the only inimitable resource may be the firm's ability to learn.¹² As noted, collecting data about customers is an important step in learning about customers, segmenting them and creating customer valuations. Therefore, the collection of various data types involved in developing a CRM system represents specific learning activities involving customer information, which can ultimately lead to competitive advantage.

According to organizational learning theory, the customer information process involves first acquiring the data and then transforming them into customer information.¹³ We examine this research in terms of how collecting customer information can lead to customer data quality in CRM systems. Customer data quality in CRM systems is seen as an outcome of these various data-oriented learning activities, with overall data quality improving as the firm learns more about its customers through gathering and managing various types of information. Here, customer data quality in CRM systems is viewed as a penultimate step to competitive advantage and in particular involves the quality of data that are used in contact

management systems, other aspects of the CRM system and overall data quality used in systems relating to CRM.

To determine exactly which data-oriented learning activities to include in our model, we looked both to practice and theory. We considered the fact that practitioners have long categorized various types of customer information according to their value to the firm, considering basic contact information and transactional information to be more easily imitated and psychographic, relational and personalization activities to be more difficult to implement, less easy to imitate and more likely to bring competitive advantage to the firm.

We test the hierarchy of learning activities hypothesis by developing a comprehensive list of customer data-oriented learning activities and analyzing their potential impact on customer data quality in CRM systems. Liu and Wang indicate that customer information should come from both dynamic sources such as primary data collections and static sources such as appended internal or external.¹⁴ Both types of data are included in our model. Figure 1 illustrates the relationship between the collection of various data types as learning activities and customer data

quality in CRM systems as studied here. The relationship is shown as a pyramid, with the base indicating the learning activities that require the least effort to collect, yet provide the foundation for amassing and using other types of data. The top of the pyramid indicates activities such as personalization and relational communications along customer touchpoints, learning activities that are most likely to be difficult to imitate because they are based on intimate customer knowledge and therefore likely to yield the greatest advantage. At the base of the pyramid, requiring the least effort to collect, are different types of customer and prospect contact data. Transactional history data are listed next, with psychodemographic data, customer touchpoint data and personalization representing increasingly higher-order customer data categories.

Below we explain the different types of data in our framework and develop hypotheses for each, as well as an overarching hypothesis for relating these data-oriented learning activities to customer data quality. We explain the relevance of each data type to CRM system data quality and hypothesize a relationship between the variables.

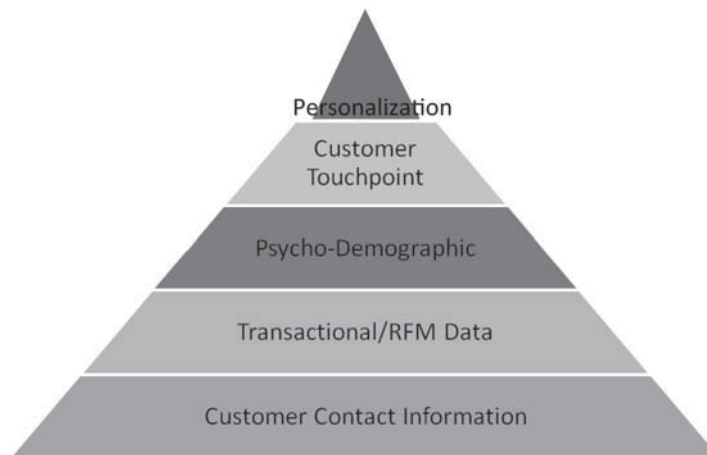


Figure 1: Proposed data type pyramid.

Customer/prospect contact data

Although critical to the operation of any CRM system, customer contact information represents the most basic data in our informational pyramid. Without this information, it would be virtually impossible to develop any database-driven marketing effort. We include a host of contact data including customer and prospect information, others involved in the purchase decision, and identifying currently inactive customers.

Hypothesis 1: The increased use of customer/prospect contact data will be related to higher data quality in CRM systems.

Transactional

Next we look at information such as the customer's last purchase date and frequency of purchases, data types that are considered financial transactional information relating to the purchase process. This type of data is essential to the RFM (Recency, Frequency and Monetary) value calculation, as well as the idea of customer retention and customer lifetime value. These value calculations are the core to the management of both customer and shareholder relationships. Armed with this information, firms can also calculate share of wallet, the net present value of a customer and otherwise determine the customer's value.¹⁵ Therefore, a transactional-level view of the customer is essential and this type of data must be collected from and about the customer.

Thus, we posit:

Hypothesis 2: Increased use of transactional data will be related to higher data quality in CRM systems.

Psycho-demographics

Augmenting the data types discussed so far, we consider that the customer relationship

process consists of five stages: prospect, acquire, retain, loyalty and partner.¹⁶ As part of these five stages of relationship development, various data sources can provide inputs, an important one of which is psycho-demographics. Psychographic-based customer data consist of information such as values, motives, attitudes, beliefs and lifestyles. Such information can be interactively utilized as part of the customer relationship process, to maximize firm performance. This information can be generated internally from a customer satisfaction and needs survey, and externally from commercially acquired information about customers and prospects, which would then be appended to internal data files. In fact, O'Leary and colleagues discuss a feedback loop that begins with primary and secondary customer data inputs, followed by the integration and processing of information gathered from multiple sources, and then the strategic outputs that include promotions, advertising and selling strategies.¹⁷

Tailored and personalized communication strategies can be developed by augmenting customer demographic information with psychographic profiles, to achieve interactive customer communications.¹⁸ Although psychographics can be viewed as somewhat static elements, when coupled with dynamic CRM data, such as transactional information, they can aid in the formation of a longitudinal view of the customer.¹⁹ Whereas the connection between customer demographics, customer lifetime value and customer satisfaction may seem somewhat obvious on the surface, models have recently been developed, which confirm this relationship.^{20,21} Thus, Hypothesis 3 suggests:

Hypothesis 3: Increased psycho-demographic profiling will be related to higher data quality in CRM systems.

Customer touchpoints

We continue up the pyramid by examining the role of relational customer touchpoint communications in developing customer data quality in CRM systems. Although customer information is often viewed as two dichotomous types, that is, transactional versus psycho-demographic data, basic versus personal, sales versus marketing orientations or product-centricity versus customer-centricity, research does show that there is overlap in terms of their collection and use. In fact, both types of customer profiling and marketing can occur simultaneously and at effectively varied customer touchpoints.²² Whereas both transactional and relational data are important to the maintenance of a strong customer orientation, studies show that capturing and understanding data collected when and where customers interact is critically related to improving performance.²³ Although not meant to be exhaustive, customer touchpoints include information captured via the Internet, email click-throughs, service encounters and telephone call centers.

In fact, ongoing customer relationships across multiple media and customer touchpoints are central tenets to relational communication and key requisites for increasing customer retention.²⁴ Research shows that customer relationship performance is improved when firms have a set of deliberate relationship information processes in place to capture and utilize information from various multi-channel touchpoints as part of a customer-centric management system.²⁵ A view of customer profitability is one step further than the notion of retention, in that such information requires proactive measurement of repeat purchases and effectiveness measures for targeted promotional efforts. As CRM technology is central to such a customer-centric approach, relational data should underlie any CRM system.²⁶

Hypothesis 4: Increased use of customer touchpoint information will be related to higher data quality in CRM systems.

Personalization

Finally, personalization in the marketing context is the capability to tailor marketing communications to the individual customer.²⁷ The concept of personalization of marketing materials and communications spans several research areas. Some academic studies show that response rates for mail-based surveys can be increased through the use of personalization efforts and overall packaging of the survey materials. However, others show that when a degree of personalization already exists in communications, additional efforts do not necessarily improve results.²⁸ Providing psychological reactance theory as a framework to further understand why personalization can yield mixed results, White *et al* discuss degrees of personalization rather than the presence or absence of it.²⁹ The authors find that consumers must be able to justify the personalization and thus they must be convinced of the value proposition of the firm before receiving highly personalized messages.

Thus, it seems that one possible misconception that firms can have is that vast amounts of data can help produce better personalization efforts, but more important is the actual quality of the underlying CRM system data. Without appropriate information, which is targeted to appropriate customers, any efforts can become counterproductive and thus the focus of firms should be on the quality of CRM systems.^{30,31} Therefore, we hypothesize that:

Hypothesis 5: Increased personalization efforts will be related to higher data quality in CRM systems.

METHODS

For our study, we utilize data that are part of a multiphase research project. The first phase, not reported here, consisted of qualitative interviews regarding the development of CRM systems and the important role of customer data quality. From these interviews, a pretest was administered and adjusted based on responses and also feedback from several key industry executives. The final survey was then mailed to 525 executives in the financial services industry, specifically the banking industry. The financial services industry was selected because many firms in this area, including the Royal Bank of Canada and Charles Schwab, have been cited for superior quality customer information use. Names were obtained from Hoover's database and the unit of analysis was the business unit. Self-reports of performance were used, as performance data are not usually available on a business unit level. In order to get accurate responses, the business unit manager was consulted.

The three-wave methodology of Dillman³² was used with two mail waves, the second of which included a US\$2 bill as an incentive, and one telephone follow-up wave. Respondents were given the option of mailing the questionnaire back or completing the questionnaire online via the attached URL. The questionnaires were coded so that respondents and non-respondents could be identified; participants were made aware of the coding number. Emails were tracked for those completing the questionnaire online. A second mailing was sent to non-respondents approximately 14 days after the mailing was delivered. Finally, two graduate assistants called the remaining non-respondents, either speaking with them personally or leaving a voice mail message.

In total, 170 questionnaires were returned. Almost all of the respondents chose the online survey option, essentially

eliminating question non-response (responses were largely mandatory). Four respondents were removed in model development owing to non-response, leaving 166. This resulted in an overall response rate of 32 per cent, which compares favorably to response rates typically received from business executives.³³

Approximately 45 per cent of the businesses are B2B and about 40 per cent are B2C, with the remainder probably accounted for by other trade relationships. The respondents reported that 50 per cent of their business is conducted at retail or branch banking locations and that they rely on outside sales personnel for 27 per cent of their business. Online business was a little over 10 per cent of their sales, consistent with the industry average.

Respondents average approximately 20 years of business experience, and thus appear qualified to answer the broad range of performance and organizational questions in the survey. Respondents were asked to report either assets or sales volume because assets are an important indicator of size in the financial community. Most of the firms (63 per cent) reported at least \$500 million in sales or assets under management, whichever was appropriate for their firm.

Scale development

On the basis of prior work in the CRM and organizational learning literatures, scales were developed for the five independent variables in our model: (1) Customer/Prospect Contact Data, (2) RFM/Transactional Data, (3) Psycho-demographic Data, (4) Customer Touchpoint Data and (5) Personalization Data. Because our hypotheses posit that the increased collection of these five data types will lead to higher data quality CRM systems, all variables were assessed using multi-item five-point scales measuring the percentage of time that these data are collected

(0 per cent, 25 per cent, 50 per cent, 75 per cent, 100 per cent). The survey items are reported in Table 1. Owing to the length of the questionnaire, a limited number of control variables were included. Variable means did not differ based on size of firm, B2B versus B2C sales, or whether sales were in-store versus via the Internet. Three overall customer data quality items were used including overall quality of customer contact system, overall quality of data and overall data quality of CRM system. These three items were factor analyzed and loaded highly on a single item CRM system data quality dimension. A summed score was then calculated and used as the dependent variable in the regression.

Initially, the questionnaire items representing the five theoretical constructs were subjected to an exploratory principle components factor analysis. Items with low and/or multiple factor loadings were dropped from the assessment. Items of each construct were carefully examined to make sure that all items were loaded based on theory. Next, the remaining items were subjected to an item to total correlation analysis. Items with low item to total correlations were eliminated. The coefficient alpha for each of the measures was computed to estimate the reliability. As is shown in Table 1, the coefficient alphas range from 0.76 to 0.90, indicating satisfactory levels of reliability for the measures.

RESULTS AND DISCUSSION

A multiple regression was performed to test Hypotheses 1–5. The factor scores were used as independent variables; overall CRM system data quality was the dependent variable. As shown in Table 2, the overall model was significant ($F=23.1$, $P<0.001$) and explained 42 per cent of the variance in overall CRM system quality. Each of the five data types had a significant and positive impact on overall CRM system quality

(all $P<0.001$). Although we did not specifically hypothesize the ordered impact of the information types within our data pyramid on overall system quality, data related to the ability to utilize personalized offers and communications, our highest-order data type, had the largest standardized coefficient ($\beta=0.39$); psycho-demographic data ($\beta=0.30$) and RFM/transactional data ($\beta=0.31$) were relatively equal in importance, followed by customer/prospect contact data ($\beta=0.25$) and customer touchpoint data ($\beta=0.13$).

The standardized regression weights represent *importance weights* of each learning activity and are illustrated in the pyramid in Figure 2. Except for customer touchpoint data, the customer type data pyramid aligns relatively well along a data quality continuum, following the path of firms as they collect basic to more complex data. At its apex, the ability to personalize marketing messages and offers has long been seen as a key element in integrated marketing communications. Today's marketers understand that customer response is due in great part to providing value and communicating it in target-specific ways. Transactional and psycho-demographic data serve as key assets when developing personalization capabilities. Collectively, these data offer marketers the ability to select appropriate products and services and to communicate meaningfully. Although less important in the data pyramid, customer/prospect contact information provides a solid foundation for identifying target customers and establishes the ability to track customers over time. Although the least important data type for predicting data quality and CRM system success, customer touchpoint data are nonetheless key informational assets. One explanation for the lower importance scores is that these touchpoints should in fact be seen as the base of the pyramid, in that it is at these interaction locations that response data are collected. As shown in Figure 2,

Table 1: Factor analysis of data types

	Data type dimensions			
	Personalization	Psycho-Demo	RFM/transactional	Customer and prospect contact
Tailor communications to prospects	0.874	—	—	—
Tailor marketing offers to prospects	0.869	—	—	—
Tailor marketing offers to customers	0.864	—	—	—
Tailor communications to customers	0.840	—	—	—
Marketing offers customers responded to	0.641	—	—	—
Method of contact for marketing offer	0.589	—	—	—
Marketing offers made to customers	0.545	—	—	—
Customer lifestyle data	—	0.665	—	—
Customer psychographics	—	0.635	—	—
Externally purchased lists	—	0.631	—	—
Customer demographics	—	0.625	—	—
Commercial/acquired/rented databases	—	0.609	—	—
Competitor information about target customers	—	0.581	—	—
Customer satisfaction surveys	—	0.495	—	—
Customer need surveys	—	0.473	—	—
Customers' last purchase date	—	—	0.788	—
Frequency of purchase	—	—	0.729	—
Revenue by product or product line	—	—	0.620	—
Total revenue from customer	—	—	0.615	—
Length of time as customer	—	—	0.615	—
Customer retention data/turnover rate	—	—	0.591	—
Basic Prospect Data	—	—	—	0.848
Detailed prospect info	—	—	—	0.823
Names of others involved in the purchase	—	—	—	0.648
Detailed customer information for those who have not bought in the past year	—	—	—	0.645
Customer contact information	—	—	—	0.458
Email communications	—	—	—	—
Service contacts	—	—	—	—
Internet communications/sales	—	—	—	—
Telephone contacts	—	—	—	—
Coefficient α	$\alpha=0.90$	$\alpha=0.80$	$\alpha=0.81$	$\alpha=0.81$
% explained	14.8	12.2	11.7	10.2
				$\alpha=0.76$
				9.0

Table 2: Regression results

<i>Data type</i>	<i>Std β coef</i>	<i>t-value</i>	<i>Sig</i>
Personalization data	0.39	6.5	0.001
Customer touchpoint data	0.13	2.2	0.001
Psycho-demographic data	0.30	4.9	0.001
RFM/transactional data	0.32	5.2	0.001
Contact/prospect contact data	0.24	4.1	0.001

Notes: Dependent variable=Summed Overall Data Quality of CRM System. $F=23.1$, R -square=0.42, $P<0.001$.

data can thus be categorized into three types – personalization, offers and communications, and customer information and collection points.

CONCLUSIONS AND IMPLICATIONS

Managers have long suspected that paying attention to and collecting relational and transactional data leads to performance. Our findings illustrate a path to performance as a result of collecting information about the customers in a learning context. Research spanning multiple cultures shows that knowledge management when combined with a customer focus creates an effective model for the deployment of CRM (called KCRM) efforts.³⁴ In essence, this

framework suggests that customer information must be managed through efforts that include knowledge identification, capture, selection, storage, sharing, application, creation and selling. One aspect of knowledge management, customer knowledge orientation, requires that companies keep marketing databases up to date, utilize internal database marketing information, monitor the accuracy of information in marketing databases and utilize performance-based reward systems. Stein and Smith find that customer knowledge orientation leads directly to more use of CRM, which then enhances firm performance.³⁵

Although companies appear to understand the need to generate customer information, they struggle with the process of integrating that information throughout the organization, in other words the creation of customer knowledge competence.³¹ The transactional versus relational approach has also been applied to segmentation theory, with the idea that the key difference between these two approaches involves breaking down versus building up the market to form segments. Breaking down the market implies that the market consists of a set of segments that can be identified, that is, that similarities in customers can be captured when going

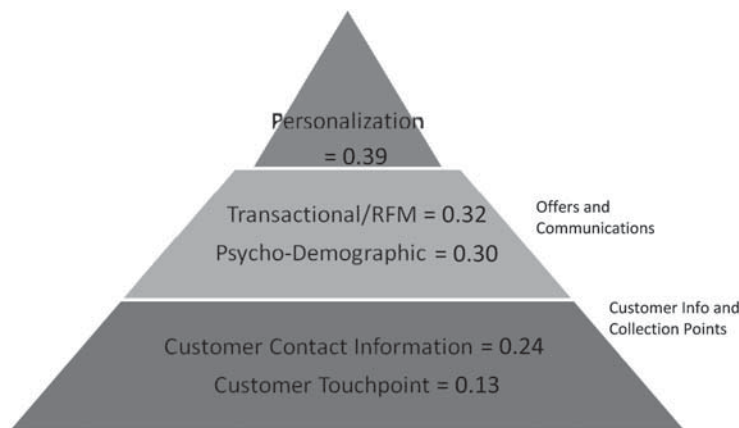


Figure 2: Data types and standardized coefficients relating to CRM systems data quality.

from large to small scale. On the other hand, the building up segmentation method assumes that customers are unique and that they must be segmented from an individual to aggregate level.³⁶ Building from this research on knowledge orientation, data collection in this study is seen as a customer data-oriented learning activity that is a precursor to the quality of the CRM system as measured by the quality of its data. Such data tell managers how to organize their priorities in terms of data learning activities to create the highest quality CRM data so that improved performance can ensue. Capturing the results of personalized communications, as well as detailed transactions of customer interactions, will yield the highest results and therefore should be the organization's strategic focus.

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