

Information Quality in Customer Relationship Management Systems

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Abstract

Customer Relationship Management follows the increasingly necessary movement towards total integrated customer information in order to more adequately serve the needs of both business and consumer by tailoring services and products in the direction of both parties. In the pursuit of data integration, a symbiotic relationship follows, incorporating the synergistic benefits of networking, individualized attention, and customer loyalty yielded from the tenants of cooperation, trust, and information sharing, maximizing on profitability through increased returns on marketing effectiveness. However, obstacles facing customer relationship management include the complexities of the medium, whether it is paper, electronic, or competing electronic databases and paper databases, which in turn can lead to redundancies and an overproduction of customer information. Such redundancies expend time and resources, and alienate customers, thus putting emphasis on the management of customer information to ensure quality. Under such controls, information quality improves, increasing the margin of profit, and reduces extraneous costs. The gist is that integration of various pieces of information about customers gathered all across an organization can improve productivity with the use of proper procedures, standardized definitions of data, and adequate determination of system requirements. This paper discusses the importance of information quality to customer relationship management and the problem of poor information quality, and proposes several hypotheses regarding the impact of different aspects of information quality on the effectiveness of CRM and costs of operations. This paper presents a work in progress.

Keywords: Customer Relationship Management (CRM), Information Quality, Quality Assurance, Quality Management, Customer Relationship Marketing

1. INTRODUCTION

In spite of a high risk of failure, Customer Relationship Management (CRM) is becoming a necessity to corporations (S. Nelson 2002). Customers want businesses to treat them as individuals, not just one of the buyers; in other words, both consumers and business entities now take customer-centric-

ity for granted as "a basic fact of life." In light of this "customer centricity" expectation, businesses must provide products and services on the basis of personal knowledge of customers. It then becomes necessary for an organization to establish and maintain a relationship with its customers to understand their needs and preferences and use that information to generate a higher level of

PRELIMINARY

Bose, Hashemi, and Rebhun

Fri, Nov 3, 2:30 - 2:55, Normandy A

PRELIMINARY

customer satisfaction. Customer relationships can be developed successfully only if there is accurate information about the market, customer, and product and services, and those are integrated.

Significant investments have been made by many organizations in establishing integrated systems, CRM, and e-business applications that use customer information across the organization. The quality of information is becoming as important as the content because businesses are increasingly relying on information as a resource to obtain sufficient return on the technology investment. CRM systems are only as good as the information they contain (Nelson et al. 2001).

While there are many advantages of CRM, most companies are not close to achieving the maximum of those benefits. With data scattered across various divisions, isolated databases and fragmented records, due to the departmental nature of customer actions and lifecycles, most companies have yet to assemble the proper foundation to provide themselves with a complete view of their customer. Often managers have the misconception that if they have automatic information handling in place, then they have perfect information. Such mistaken beliefs lead them to be unaware of the concerns about information quality. When customer data does not reflect real world conditions, or is not easily used and understood by the data user, it may be of poor quality (MacSweeney 2002, Peikin 2003).

In the remainder of this paper, the importance of information quality to customer relationship management and the problem of poor information quality will be discussed. Furthermore, several hypotheses regarding the impact of different aspects of information quality on the effectiveness of CRM and costs of operations will be proposed.

2. INFORMATION QUALITY AND CRM

CRM is about creating systems that allow a more intelligent and specific relationship between a company and any individual customer. A CRM system is created through an integration of methodologies, strategies, software, and other web-based capabilities (Mills 2001). An important objective of CRM is to retain existing customers by knowing them, understanding what they want, and satisfying their needs through a high level of

service that is personalized as much as possible. The focus of marketing based on customer relationship, also known as relationship marketing, is on attracting and retaining customers through cooperation, trust, and sharing of information. Relationship marketing facilitates a company's effort to identify, maintain, and build up a network with individual consumers and to continuously strengthen such a network through interactive, individualized and value-added contacts over a long period of time (Shani and Chalasani 1992). It seeks to establish, maintain, enhance, and commercialize customer relationships so that the objectives of the parties involved are met, which is done by a mutual exchange and fulfillment of promises (Gronroos 1994). In other words, relationship marketing is based on communicating with consumers, listening to them, learning their wants, needs, and desires, and catering to those concerns.

Good relationship marketing benefits customers with better overall service and companies through potentially higher revenues and profits, and clearer differentiation from competitors. Developing and enhancing long-term relationships with customers requires using quality data about the customers, and unfortunately the problem of "bad data" has hindered the growth of CRM (MacSweeney 2002, Nelson et al. 2001, K. Nelson 2002, Krill 2001, Young 2000). Furthermore, lack of trust in the data and substandard data quality are among reasons why corporate data warehouses are not used in marketing (Payton and Zahay, 2005). Customer data can be captured at many points, mostly where a contact is made with the customer such as at the point-of-sale, in customer service interaction, and during inquiries (MacSweeney 2002). Many companies are using frequency programs to capture accurate information about their customers. One example is the use of credit and loyalty cards that enable the capturing of detailed data about what and how often customers buy. Typically, customer information has been stored in the marketing databases of a company. However, when the customer interacts with various units in a company, such as customer service, technical support, or shipping, data resulting from such interactions may end up on multiple databases across the company. Unless all pieces of the customer's information are made available to the CRM system, it is difficult to get a total view of the customer's behavior. Market-

PRELIMINARY

PRELIMINARY

PRELIMINARY

Bose, Hashemi, and Rebhun

Fri, Nov 3, 2:30 - 2:55, Normandy A

PRELIMINARY

ing strategies and programs change rapidly, and to get the most out of relationship marketing, customer information has to be current. Accurate, complete, and relevant customer information is the core of CRM.

3. PROBLEMS WITH CUSTOMER INFORMATION QUALITY

Information today is available in greater quantities with greater complexity and from more sources than ever. Being eager to extract intelligence and thus access the opportunities that are possible from the information, many companies assume the quality of information as given and ignore critical issues of information quality. This can be costly since CRM systems must have accurate, complete and integrated information as their core in order to be effective (Peikin 2003). For example, information quality issues in implementation of SAP systems were studied and it was found that several types of data quality problems can undermine the performance of SAP systems (Xu et al. 2002).

As organizations increasingly depend upon their databases to support business process and decision-making, and the number of databases continues to multiply, the number of errors in stored information and the organizational impact of these errors are likely to increase (Klein 1998). One of the common causes of defective information in general and customer information in particular is field originated transaction errors (MacSweeney 2002, Krill 2001). Whatever data error occurs during information capture in the field can be easily multiplied by additional errors when third parties, at a separate time in a removed context from collection, key in the information.

As business goes global, the information that is generated and entered by one group (e.g., sales persons) in one part of the continent or world is used for decision-making by another group (e.g., marketing managers) thousands of miles away. Unless there is constant and thorough communication between all the parties concerned, there could be different interpretations about the context of the information between the information generator and the information user leading to poor decision-making. Information that is gathered for one business purpose and intended to be stored in a single database may actually be used for many business purposes and

replicated in a number of databases accessed by multiple users (K. Nelson 2002, Huang et. al. 1999).

In an effort to understand the underlying factors that influence information quality, there have been some studies of critical success factors in information systems and quality management, such as total quality management (TQM) and just-in-time (JIT). It was found that training given to data producers and information users, top management support, organizational structure, and change management influenced data quality (English 1999).

The difficult task of quality assurance further complicates the information quality problem at the source. In a world of multiple, ad hoc information users, much of the certainty of the data production environment disappears (Ballou and Tayi 1995). Not only is the quality of information uncertain, but its uses may be known only in part. Additionally, inspection procedures do not have a proven track for effectiveness since the information undergoes a series of ad hoc processing procedures. Other factors include the uncertainty regarding what constitutes the information resource that should be maintained, the perceived lack of information quality importance, the multiplicity of potential problems with information, the inadequate documentation of data definitions and meaning, and the uncertainty regarding the seriousness of deficiencies.

It is important to understand the specific factors, many of which are described above, that can debase information value, especially in light of the enormous power of customer information to influence the organization. While CRM systems can be expensive, \$1 million or more, and the information is donated to the system, being generated as a byproduct of business transactions, the information can become an expensive resource if it undermines the goals of systems that use it. To some, it is not an option not to have CRM (S. Nelson 2002, MacSweeney 2001, Young 2000). No matter how sophisticated the CRM, e-business or other IT implementations are, users of the technology will reject it if they cannot trust the information it contains. Inconsistencies, omissions, and inaccuracies in customer information destroy its reliability and therefore, value. As a result, managing information quality becomes both a necessity and a challenge

PRELIMINARY

PRELIMINARY

for those organizations that are attempting to compete by planning and implementing CRM.

4. INFORMATION QUALITY AND OVER-PRODUCTION OF INFORMATION

Information that is of poor quality leads to failure of processes. Because the failed processes have to be recovered and corrected, poor quality information adds to costs. In a CRM implementation in a large European telecommunications company the data quality issues were invisible until the CRM implementation was well under way and the company's lack of attention to budgeting and scheduling for addressing the potential problems jeopardized the success of the project, particularly among user groups (Reid and Catterall 2005). Poor information quality also causes customer alienation, which can adversely affect customer lifetime value. Customers are alienated because poor quality information wastes their time. Poor quality information also wastes the customer service provider's time, money, materials, and facilities. This occurs in various ways.

Quality of information may suffer due to overproduction of information. Overproduction of information comes from redundant systems, duplicate records, and non-formal information generation. An example is when employees manage their own contact information in Personal Information Manager (PIM) systems, such as Microsoft Outlook, and share it unsystematically, causing redundant and often inconsistent data to proliferate (Boyle 2004). Organizations may have redundant application systems that capture basic information about their customers. This is most likely to happen when the organization has multiple lines of products or services and those are managed vertically. For example, an insurance coverage provider has life insurance services as well as auto insurance services. One application operating in the life insurance unit will be capturing customer information while the auto insurance unit may be running a different application system to capture information about their customers, thus information about the same customer may be being captured multiple times within the same organization. Any time the same information of one customer is captured more than once, it leads to waste of time, money and effort.

It is also possible that within a single system, records about the same customer may be captured multiple times creating duplicate records. This can happen due to lack of procedures or training, or when employees do not follow procedures. For example, it can happen when customer service representatives who are taking calls from customers create new records of those customers instead of checking to see if the customers are already on file. Duplicate records not only waste data storage space and cause error-prone service to customers, but also make it hard to determine the customer's lifetime value. It also causes duplicate mail-outs of promotional and other information to customers. Duplicate records can corrupt the information further when employees, on detecting multiple customers with the same name, try to reconcile the problem by consolidating different people into the same record.

Non-formal information is generated when knowledge workers who cannot do what they need to do with the formal systems in place build their own systems to support their information needs. The time and effort the individual knowledge workers spend in building their own systems could be better spent in adding real value to the organization's productivity if the organization developed all the necessary information systems to meet the organization's objectives and thus did not have to spend time on having the knowledge workers build personal systems to close the holes created by missing systems.

The costs related to overproduction of information can be significant and include (i) development and maintenance costs of redundant applications, (ii) costs of distributing information among related systems, (iii) costs of removing redundant data through matching, consolidating and purging data from affected databases, (iv) costs of operating, handling, and processing of redundant information, and (v) the opportunity cost of not knowing customer relationships with different parts of the business. Based on our discussion, the authors propose the following hypothesis.

Hypothesis 1

Controlling the overproduction of information is expected to improve the quality of information in an organization.

Hypothesis 2

Controlling the overproduction of information is expected to reduce the costs of storing information.

Hypothesis 3

Controlling the overproduction of information is expected to reduce the opportunity cost of missed customer relationships.

5. INFORMATION QUALITY AND MULTIPLE PROCESSING

Organizations sometimes create multiple application programs that perform similar functions for different business divisions or product lines when they estimate that a separate application is likely to be developed quicker than other alternatives. One example of this is when multiple applications are put in place to capture the same or similar information when one application is sufficient. An example of this is when a company on winning a major contract decides to clone an existing application and the related database to meet the needs of the new contract. When regulatory requirements change over time and other upgrades are needed, those have to be carried out multiple times on the two applications. The parallel maintenance of the two systems results in wasted resources.

Another way information gets processed multiple times is when information is captured manually on paper forms and then the information is re-captured from paper to electronic storage. This transcription activity involves capturing information twice, with the potential for errors to be introduced by the intermediation process due to illegible handwriting, poor form design, and synchronization problems between form and screen design. The multiple processing of information can be eliminated by allowing the actual information producers to capture information electronically, such as having the field workers capture information electronically using appropriate electronic devices.

Sometimes knowledge workers do not find the operational support in terms of application program, data, or other system-related resources that is needed to perform a task that they know will add value to the product or service being provided to the customer. If the knowledge workers come up with work-around solutions by creating a new application program to carry out the additional processing, then even though value is being

added, the work-around solutions exist outside the normal frame of resources of the company and would be estimated as adding inefficiency. Such solutions, in the first place, should be part of the company's standardized, error-proofed, and incorporated set of resources. It is possible that different business units or product lines may require slightly different information about their customers or products, such as different code values for the same fact, such as income range or years of loyal patronage to the company's products. When knowledge workers in the data warehouse team are faced with integrating all such data into the data warehouse, they are likely to resort to their work-around methods to integrate the various codes for the same data entity if the company's standard procedure does not contain the steps to address such anomalies. All such extraneous steps are wasted data processing activities because they do not add any value to the original data. Such extra processing of data is a result of defective data definition and application development process. The example of existence of multiple code values for the same data item produces additional wasted efforts when business personnel have to learn the different code values when communicating with personnel of various business units or reading reports from the various units. We now propose the following hypotheses.

Hypothesis 4

Insufficient determination of system requirements will cause development of hidden information systems to process customer data leading to higher costs and poor customer service.

Hypothesis 5

Lack of formal procedures for company-wide standards for data definition will increase the cost of processing of customer data.

6. CONCLUSIONS

Poor quality of information causes poor customer service, customer alienation, lost customer lifetime value, and increased cost of data storage and processing. Through a series of hypotheses the authors propose that CRM requires a comprehensive, unified view of the corporate information processing requirements about their customers and the customer data collection arrangement in order to serve the customers better and reduce the cost of doing so. If the hypotheses are proven true, it will help motivate companies to look closely at their existing informa-

PRELIMINARY

Bose, Hashemi, and Rebhun

Fri, Nov 3, 2:30 - 2:55, Normandy A

PRELIMINARY

tion as well as their specific information requirements for providing improved customer service and experience, understand the business drivers for information quality, how the information is used and who uses it. Once the companies realize the need for better information quality, they will be encouraged to adopt some kind of information quality management policy, the objective of which can be to minimize redundancy of information, inaccuracies and incompleteness in customer records, which would then reduce operational inefficiencies and consequent costs.

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PRELIMINARY

PRELIMINARY