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# Information Quality in Customer Relationship Management

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In today's business world where information is the ultimate currency, the higher quality the information, the more valuable and powerful the information is to those who possess it.

Good and accurate information is the most important factor in determining how successful a company is in its usage of the CRM application. A successful CRM strategy is primarily determined by the quality of information residing in the application. High quality information is essential to a company that manages its sales and marketing goals using a CRM system.

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## I. Introduction

Customer information is the lifeblood of CRM. Therefore, the development and maintenance of consistent, high-quality customer information is critical to CRM success.

Unfortunately, many businesses do not devote proper focus to the importance of information quality and consistency. In fact, findings from a 2001 information management study conducted by PricewaterhouseCoopers reveal just how widespread information quality problems are in businesses worldwide. Based on a survey of 600 large and midsize businesses in the Unites States, Europe and Australia, the study's findings included the following:

- Seventy-five percent of the organisations surveyed admitted that defective information had a negative financial impact on their business. Fifty percent incurred extra costs to reconcile information.
- One-third had been forced to delay or scrap new systems - and a similar percentage had failed to bill or collect receivables - due to information problems.
- One survey respondent reported that information problems caused an $8 million loss in a single fiscal year. Another reported that an incorrect unit of measure in its system led to the delivery of two containers that were bigger than the customer recipient's entire warehouse.

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## II. Concepts of Information Quality

### a) *Information quality definition*

The concept of quality has been discussed extensively over recent decades. Various definitions are to be found in a wide range of literature. Gilmore (1974) defines quality as conformance to specifications. This definition is relatively straightforward and frequently used in manufacturing industries. It facilitates measurement and increases measuring efficiency. Organizations can determine the quality of products by measuring how well the product conforms to an established specification. Also, the measuring procedure can be automatically implemented. However it fails to capture the customer's view on product performance. To compensate for the disadvantage of this definition, Gronroos (1983) defines quality as meeting and/or exceeding customer's expectations. This definition is especially prevalent in marketing research and the service industries. Following this definition, researchers posit that it is the customer who is the ultimate judge of the quality of a product/service. Thus organizations can make a quick response to market changes. However, it is difficult to measure the extent to which a product/service meets and/or exceeds the customer's expectation. Since different customers may assign different values to Product/service attributes, coordinating and unifying the various quality results are the principal difficulties facing this definition. To provide a general definition, Juran (1974) introduces the definition of quality as fitness for use, which is used to measure the extent to which a product successfully serves its intended use. As this is the definition widely used in information quality research, we adopt fitness for use as the definition of quality in our research.

There are two significant definitions of information quality. One is its inherent quality, and the other is its pragmatic quality. Inherent information quality is the correctness or accuracy of information. Pragmatic information quality is the value that accurate information has in supporting the work of the enterprise. Information that does not help enable the enterprise accomplish its mission has no quality, no matter how accurate it is.

Inherent information quality is, simply stated, information accuracy. Inherent information quality is the degree to which information accurately reflects the real-world object that the information represents. All information is an abstraction or a representation of

something real. Jean Baudrillard, the French semiologist, observes that "the very definition of the real becomes: that of which it is possible to give an equivalent reproduction."

Information is an equivalent reproduction of something real. If all facts that an organization needs to know about an entity are accurate, that information has inherent quality- it is an electronic reproduction of reality. For example, if someone has a information value of "October 24, 1976" for my daughter Ashley's "Birth Date," that information has inherent quality. Inherent information quality means that information is correct.

Pragmatic information quality is the degree of usefulness and value information has to support the enterprise processes that enable accomplishing enterprise objectives.

In essence, pragmatic information quality is the degree of customer satisfaction derived by the knowledge workers who use it to do their jobs.

Information in a information base or information warehouse has no actual value; it only has potential value. Information has realized value only when someone uses it to do something useful; for example, to ship an order to a customer, or to determine the correct location to drill a well shaft. Pragmatic information quality is the degree to which information enables knowledge workers to meet enterprise objectives efficiently and effectively.

Information quality can be generally defined from two perspectives: information and user. From the information perspective, information quality is defined as information that meets specifications or requirements (Kahn and Strong, 1998). Some researchers argue that ultimately it is the information consumer who will judge whether or not an information product is fit for use. Thus from the user's perspective, information quality is defined as information that is fit for use by information consumers (Wang and Strong, 1996).

*b) Information quality dimension*

Many studies have confirmed that information quality is a multi-dimensional concept (Ballou and Pazer 1985; Redman 1996; Wand and Wang 1996; Wang and Strong 1996; Huang et al. 1999). Over the last two decades, different sets of information quality dimensions have been identified from both information base and management perspectives. We review information quality dimensions from four angles: identification, definition, classification, and dependency.

- *Identification of Information Quality Dimensions*

Wang and Strong (1996) propose three approaches to study information quality: the intuitive, theoretical and empirical approaches. We adopt these approaches in our analysis of the identification of information quality dimensions. The intuitive approach derives information quality dimensions from the researchers' experience or from the requirements of particular cases. In this approach, information quality dimensions are identified according to specific application contexts. For example, O'Reilly (1982) used accessibility, accuracy, specificity, timeliness, relevance, and the amount of information to assess information quality in the context of decision-making. Ballou and Pazer (1985) employed accuracy, timeliness, completeness and consistency to model information quality deficiencies in multi-input, multi-output information systems. The theoretical approach generates information quality dimensions on the basis of information deficiencies in the information manufacturing process. For example, Wand and Wang (1996) used an ontological approach to derive information quality dimensions by observing inconsistencies between the real-world system and the information system. The empirical approach provides information quality dimensions by focusing on whether the information is fit for use by information consumers. For example, Wang and Strong (1996) captured 15 information quality dimensions of importance to information consumers. Kahn et al. (2002) selected 16 information quality dimensions for delivering high quality information to information consumers. From the discussion above, we found that varying sets of information quality dimensions can be identified using different approaches.

- *Definition of Information Quality Dimensions*

The three approaches above can also be considered as three perspectives for defining information quality dimensions. The intuitive approach defines information quality dimensions from the information perspective. For example, Ballou and Pazer (1985) defined completeness as a situation in which all values for a certain variable are recorded.

The theoretical approach defines information quality dimensions from the real-world 32 perspective. For example, Wand and Wang (1996) defined completeness as the ability of an information system to represent every meaningful state of the represented real world system. The empirical approach defines information quality dimensions from the user's perspective. For example, Wang and Strong (1996) defined completeness as the extent to which information are of sufficient breath, depth, and scope for the task at hand.

The advantage of using a information perspective is that information quality can be automatically assessed and objectively controlled. The advantage of employing a real-world perspective is that the referencing quality specification is theoretically perfect. However, both perspectives fail to capture the expectations of information consumers. From a user perspective, a comprehensive set of dimensions can be used to measure information quality. Also, underlying this perspective is the idea that information quality can

be improved according to the intended use. Yet this perspective fails to measure information quality automatically, making it difficult to negotiate a large amount of information. Considering the advantage of each perspective, we use information perspective to define the dimensions and assess the quality of raw information. When assessing the quality of information products, we define the dimensions from user perspective.

- *Classification of Information Quality Dimensions*

Wang and Strong (1996) proposed a hierarchical framework that consists of four information quality categories: intrinsic information quality, contextual, representational and accessibility. Wand and Wang (1996) used an ontological approach to derive information quality dimensions and categorized them by internal view and external view. Internal view is use-independent and contains a set of information quality dimensions that are comparable across applications. External view is concerned with the use and effect of information systems, which represent the real-world system. Naumann and Rolker (2000) organized information quality dimensions with three main factors that influence information quality: the perception of the user, the information itself, and the process of accessing information. These three factors can be considered as subject, object and process. Helfert (2001) classified information quality dimensions by employing semiotics and two elements of quality, which are quality of design and quality of conformance. Semiotics comprises three levels: syntactic, semantic and pragmatic. The syntactic level considers the basic representation of information. The semantic level focuses on information related to real world objects. Finally the pragmatic level deals with information processes and information users. Kahn et al. (2002) developed a two-by-two conceptual model to describe information quality dimensions. Whilst the two rows are product quality and service quality, the two columns are conformance to specifications and meeting and exceeding consumer expectations. Therefore information quality dimensions are located in four quadrants: sound, dependable, useful, and usable. Bovee et al. (2003) presented a categorisation of information quality dimensions with the sequence of using information. The sequence includes the following four steps: obtaining the information (accessibility), understanding the information (interpretability), connecting the information with the given context (relevance), and assuring the information is free from error (integrity).

## III. Customer Relationship Management

*a) Definition of Customer relationship management*

In the marketing literature the terms customer relationship management and relationship marketing are used interchangeably. As Nevin (1995) points out, these terms have been used to reflect a variety of themes and perspectives. Some of these themes offer a narrow functional marketing perspective while others offer a perspective that is broad and somewhat paradigmatic in approach and orientation. A narrow perspective of customer relationship management is information base marketing emphasizing the promotional aspects of marketing linked to information base efforts (Bickert, 1992).

Another narrow, yet relevant, viewpoint is to consider CRM only as seeking customer retention by using a variety of after marketing tactics that lead to customer bonding or staying in touch with the customer after a sale is made (Vavra, 1992). A more popular approach with the recent application of information technology is to focus on individual or one-to-one relationships with customers that integrate information base knowledge with a long term customer retention and growth strategy (Peppers & Rogers, 1993).

Thus, Shani and Chalasani (1992) have defined relationship marketing as "an integrated effort to identify, maintain, and build up a network with individual consumers and to continuously strengthen the network for the mutual benefit of both sides, through interactive, individualized and value added contacts over a long period of time" (p. 44). Jackson (1985) applies the individual account concept in industrial markets to suggest CRM to mean, "Marketing oriented toward strong, lasting relationships with individual accounts" (p. 2). In other business contexts, Doyle and Roth (1992), O'Neal (1989), and Paul (1988) have proposed similar views of customer relationship management.

McKenna (1991) has professed a more strategic view by putting the customer first and shifting the role of marketing from manipulating the customer (telling and selling) to genuine involvement with the customer (communicating and sharing knowledge). Berry (1995), in somewhat broader terms, also has a strategic viewpoint concerned with CRM. He has stressed that attracting new customers should be viewed only as an intermediate step in the marketing process and that developing closer relationship with these customers and turning them into loyal ones should be equally important aspects of marketing. Thus, he proposed that relationship marketing be seen as "attracting, maintaining, and – in multi-service organizations – enhancing customer relationships" (p. 25).

Berry's notion of customer relationship management resembles that of other scholars studying services marketing, such as Gronroos (1990), Gummesson (1987), and Levitt (1983). Although each one of them has espoused the value of interactions in marketing and its consequent impact on customer relationships, Gronroos and Gummesson take a broader perspective and advocate that relationships

with customers be the focus and dominant paradigm of marketing. For example, Gronroos (1990) states: "Marketing is to establish, maintain, and enhance relationships with customers and other partners, at a profit, so that the objectives of the parties involved are met. This is achieved by a mutual exchange and fulfillment of promises" (p. 138). The implication of Gronroos' definition is that forming relationships with customers is the "raison de etre" of the firm and marketing should be devoted to building and enhancing such relationships. Similarly, Morgan and Hunt (1994) draw upon the distinction made between transactional exchanges and relational exchanges by Dwyer, Schurr, and Oh (1987) to suggest that relationship marketing "refers to all marketing activities directed toward establishing, developing, and maintaining successful relationships."

The core theme of all CRM and relationship marketing perspectives is its focus on a cooperative and collaborative relationship between the firm and its customers, and/or other marketing actors. Dwyer, Schurr, and Oh (1987) have characterized such cooperative relationships as being interdependent and long-term orientated rather than being concerned with short-term discrete transactions.

*b) The emergence of Customer relationship management*

As observed by Sheth and Parvatiyar (1995b), developing customer relationships has historical antecedents going back into the pre-industrial era. Much of it was due to direct interaction between producers of agricultural products and their consumers. Similarly, artisans often developed customized products for each customer. Such direct interaction led to relational bonding between the producer and the consumer. It was only after the advent of mass production in the industrial era and the advent of middlemen that interaction between producers and consumers became less frequent leading to transaction oriented marketing. In other words, the production and consumption functions became separated leading to the marketing functions being performed by middlemen, and middlemen, in general, are oriented towards economic aspects of buying since the largest cost is often the cost of the goods sold. In recent years however, several factors have contributed to the rapid development and evolution of CRM. These include the growing de intermediation process in many industries due to the advent of sophisticated computer and telecommunication technologies that allow producers to directly interact with end-customers. For example, in many industries such as the airline, banking, insurance, computer software, or household appliances industries and even consumables, the de-intermediation process is fast changing the nature of marketing and consequently making relationship marketing more popular. Information bases and direct marketing tools give these industries the means to individualize their marketing efforts. As a result, producers do not need the functions formerly performed by middlemen. Even consumers are willing to undertake some of the responsibilities of direct ordering, personal merchandising, and product use related services with little help from the producers. The recent success of on-line banking, Charles Schwab and Merryll Lynch's on-line investment programs, direct selling of books, automobiles, insurance, etc., on the Internet all attest to the growing consumer interest in maintaining a direct relationship with marketers.

The de-intermediation process and consequent prevalence of CRM is also due to the growth of the service economy. Since services are typically produced and delivered at the same institution, it minimizes the role of middlemen. Between the service provider and the service user an emotional bond also develops creating the need for maintaining and enhancing the relationship. It is therefore not difficult to see that CRM is important for scholars and practitioners of services marketing (Berry & Parsuraman, 1991; Bitner, 1995; Crosby & Stephens, 1987; Crosby, Evans, & Cowles, 1990; Gronroos, 1995).

Another force driving the adoption of CRM has been the total quality movement. When companies embraced the Total Quality Management (TQM) philosophy to improve quality and reduce costs, it became necessary to involve suppliers and customers in implementing the program at all levels of the value chain. This created the need for closer working relationships with customers, suppliers, and other members of the marketing infrastructure. Thus, several companies, such as Motorola, IBM, General Motors, Xerox, Ford, and Toyota, formed partnering relationships with suppliers and customers to practice TQM. Other programs such as "just-in-time" (JIT) supply and "materials-resource planning" (MRP) have also made use of interdependent relationships between suppliers and customers (Frazier, Spekman, & O'Neal, 1988).

With the advent of digital technology and complex products, the systems selling approach has become common. This approach has emphasized the integration of parts, supplies, and the sale of services along with the individual capital equipment. Customers have liked the idea of systems integration and sellers have been able to sell augmented products and services to customers. Then, the popularity of system integration began to extend to consumer packaged goods as well as to services (Shapiro & Posner, 1979). At the same time some companies started to insist upon new purchasing approaches, such as national contracts and master purchasing agreements, forcing major vendors to develop key account management programs (Shapiro & Moriarty, 1980). These measures created intimacy and cooperation in the buyer-seller relationship.

Instead of purchasing a product or service, customers were more interested in buying a relationship with a vendor. The key (or national) account management program designates account managers and account teams that assess the customer's needs and then husband the selling company's resources for the customer's benefit. Such programs have led to the establishment of strategic partnering within the overall domain of customer relationship management (Anderson & Narus, 1991; Shapiro 1988).

Similarly, in the current era of hyper-competition, marketers are forced to be more concerned with customer retention and loyalty (Dick & Basu, 1994; Reichheld, 1996). As several studies have indicated, retaining customers perhaps offers a more sustainable competitive advantage than acquiring new ones. What marketers are realizing is that it costs less to retain customers than to compete for new ones (Rosenberg & Czepiel, 1984). On the supply side it pays more to develop closer relationships with a few suppliers than to work with more vendors (Hayes, Wheelwright, & Clarke, 1988; Spekman, 1988). In addition, several marketers are concerned with keeping customers for life rather than with only making a one-time sale (Cannie & Caplin, 1991). There is greater opportunity for cross-selling and up-selling to a customer who is loyal and committed to the firm and its offerings. In a recent study, Naidu, Parvatiyar, Sheth, and Westgate (1999) found that relational intensity increased in hospitals facing a higher degree of competitive intensity.

Also, customer expectations have been changing rapidly over the last two decades. Fueled by new technology and the growing availability of advanced product features and services, customer expectations are changing almost on a daily basis. Consumers are less willing to make compromises or trade-offs in product and service quality. In a world of ever changing customer expectations, building cooperative and collaborative relationships with customers seems to be the most prudent way to keep track of their changing expectations and appropriately influencing them (Sheth & Sisodia, 1995).

Finally, many large internationally oriented companies are today trying to become global by integrating their worldwide operations. To achieve this they are seeking cooperative and collaborative solutions for global operations from their vendors instead of merely engaging in transactional activities with them. Such customers' needs make it imperative for marketers interested in the business of companies that are global to adopt CRM programs, particularly global account management programs (Yip & Madsen 1996). Global account management (GAM) is conceptually similar to national account management programs except that they have to be global in scope and thus more complex. Managing customer relationships around the world calls for external and internal partnering activities, including partnering across a firm's worldwide organization.

## IV. Information Quality in CRM

### a) *Place of information in CRM*

The term CRM - encompassing the largest grouping of IT concepts to date - refers to the overall concept of moving ownership of the customer away from the individual departments and consolidating it at the enterprise level. Under the CRM concept, individual departments are still responsible for customer interactions, but the enterprise is responsible for the customer. Enterprises approach CRM by automating each customer touch point: Sales force automation, the Internet, point of sale (POS) technologies and call centers are all pieces of CRM, although they are not substitutes for it.

The backbone of any CRM solution is the information behind it. Enterprises have invested considerable effort and expense in deploying CRM solutions to make their customers' experiences more satisfying, increase retention and foster loyalty. Despite this expense and effort, however, many of these enterprises still fail to understand that a CRM solution is only as good as the quality of the customer information that feeds it.

Enterprises must have three types of information to effectively manage their customer relationships: (Frazier, Spekman, & O'Neal, 1988).

- *Descriptive Information*

Descriptive information focuses on the customer, which could be an individual, a household, a business or some combination of the three. Demographic, lifestyle and psychographic information fit into this category, because all of these types of information attempt to describe some aspect of the customer. Because it is customer focused, this information is common across multiple industries and relationships, although some elements will be more important in certain industries than others.

Much of this information comes from operational systems within the enterprise or from external information providers. This information is easily available to most competitors within an industry and, therefore, yields little competitive advantage.

- *Relationship Information*

This information set includes details on the transactions and interactions that comprise the relationship between the enterprise and its customers. Acquiring relationship information has proven to be the biggest challenge for many enterprises, because they must strike a balance between collecting too much and too little information. Conceivably, the enterprise could collect vast amounts of information about every interaction, but in reality, only so much can be assimilated. Therefore, choices must be made about

which interactions, and which information about these interactions, are most valuable.

Because this information personalizes the customer/enterprise relationship, it overcomes the lack of differentiation characteristic of the generic customer information that most enterprises already have. It can also pose challenges in the areas of systems integration and information management (e.g., collecting and managing information from multiple channels and systems before identifying which information points are actually valuable).

- *Contextual Information*

Contextual information is the least common type of information for an enterprise to have; however, without the information that this information can provide - an understanding of the context of the enterprise's relationship with its customers - the enterprise is unlikely to maintain a strong customer relationship as circumstances changes.

Consider, for example, a bank that offers a fixed-rate mortgage. Customer loyalty will likely vary inversely with interest rates, so little information about the customer's description - or his or her previous relationship with the bank - will be as important to his or her loyalty as the context of rising or falling interest rates.

Because contextual information is both diverse and unstructured, it is difficult to integrate with operational customer relationship systems. Identifying the relevant pieces of information will be the first major challenge for the enterprise. Because this information describes the context of the enterprise/customer relationship, what is relevant will vary considerably among industries, and even among enterprises within an industry. For some enterprises, weather forecasts may be critical; for others, government deregulation, competitor behavior, current-affairs television programs or changes in financial markets may be important factors.

*b) Information Analysis for CRM*

How does customer information fit into overall picture of CRM? Building an understanding of the customer relationship requires different types of analysis of customer information, depending on how an enterprise will eventually use this information. This, in turn, requires an understanding of the difference between operational and analytical CRM: (Berry & Parsuraman, 1991; Bitner, 1995; Crosby & Stephens, 1987; Crosby, Evans, & Cowles, 1990; Gronroos, 1995).

- *Operational CRM* is the business strategy that focuses on the day-to-day management of the customer relationship across all points of customer contact, enabled by sales and service technologies.
- *Analytical CRM* is the component of the CRM business strategy that drives increased customer intelligence and makes information actionable across all touch points. Key components of analytical CRM include:

- Customer segmentation analysis to develop formal segments, or ad hoc selections customers for one-time-only marketing campaigns
- Customer profitability analysis to derive profitability information and predict lifetime value, enabling more profitable marketing, sales and service initiatives
- Predictive modeling to forecast likely product purchases, customers most likely to buy and customers most likely to be lost by the enterprise
- " What if " analyses to determine how specific marketing, sales and service strategies will impact customer profitability
- Real-time event monitoring and triggering, which leverages customer insight to take advantage of opportunities as they unfold
- Campaign management (or relationship optimization), which uses analytics to develop, execute, manage and measure marketing campaigns across multiple touch points -
- Personalization across all points of customer contact to deliver the most relevant message to a customer, at the right time, via the most appropriate channel

A successful CRM strategy dictates that both analytical and operational CRM be integrated, and that enterprises understand the difference between segmenting customers (analytical CRM) and targeting them (operational CRM). Segmentation is about understanding behaviors and characteristics common to groups of customers. Many enterprises think this is synonymous with customer targeting, but it actually serves a different purpose.

Segmentation enables enterprises to understand the dynamics of customer relationships and is used in two key ways: (Berry & Parsuraman, 1991).

- Determining characteristics of profitable customer segments, enabling enterprises to target prospect groups more effectively and aid in the process of targeting current customers
- Identifying information elements that indicate a change in the relationship, enabling enterprises to prepare for future events affecting other customer groups

*c) Information quality Process in CRM*

In today's business world where information is the ultimate currency, the higher quality the information, the more valuable and powerful the information is to those who possess it.

Good and accurate information is the most important factor in determining how successful a

company is in its usage of the CRM application. A successful CRM strategy is primarily determined by the quality of information residing in the application. High quality information is essential to a company that manages its sales and marketing goals using a CRM system.

The Oracle/Siebel CRM on Demand user has strong analytical suites available at their fingertips, but these powerful tools are dependent on the accuracy and usability of the information. If poor quality information is either imported or resides in the system, then the robust analytical potential of Oracle/Siebel CRM on Demand is rendered less powerful, if not entirely neutralized. Businesses throw people and money at the troubles caused by poor quality information, but technology that solves the problem more effectively, and with fewer resources, is now available.

- *Discovery & Analysis* To implement a CRM application, information migration must take place. This involves consolidating information from various enterprise source systems and information bases and mapping it to the target CRM system. Too often, organizations undertaking information migration rely on inaccurate metainformation and out-of-date documentation, resulting in design specifications based on erroneous assumptions about the source information. Information migration based on flawed mapping specs is akin to building a house on a shaky foundation. Each successive phase of information migration - including extraction, cleansing, matching and house holding - that builds on the faulty mapping specs is inherently flawed. Unfortunately, the resulting information problems don't manifest themselves until the testing phase, when it's too late. Information analysts are then forced to go back to the discovery and design phase, adjust the assumptions, and repeat the entire process. As a result, information migration projects can spiral out of control, wasting precious time and resources. Clearly, early detection and correction of problems in the source information can drastically reduce the risks associated with information migration. The CRM project can then be planned and executed with accuracy and confidence. As well, project costs can be managed more effectively: an error detected during the project-testing phase can cost up to 100 times more to correct than the same error found during the design phase. To handle source information issues upfront, organizations need to employ a powerful, automated discovery and analysis tool that provides a detailed description of the information's true content, structure, relationships and quality. This kind of tool can reduce the time required for information analysis by as much as 90 percent over manual methods. Information discovery and analysis allows organizations to understand whether their source systems are account-based or customer-based and whether customers have been properly identified as individuals or organizations. It is also important to know if more than one record exists per customer, and if so, how to identify the best record. Or better yet, how to combine the best elements of each record into a new, consolidated record. Having determined the true nature of the underlying source information, the organization is ready to create the necessary information quality transformation rules for the information migration to its CRM system. Gratner, 2003; Jill; 2004).
- *Information Conversion & Cleansing* At this stage, the organization is ready to identify and correct formatting errors in customer and product information. This information can range from basic contact information to tax ID numbers and product numbers to any other information the user may wish to correct. Misspellings, transpositions and other anomalies can be amended, as well. Information quality also includes the identification and elimination of duplicate records for individuals, corporations and households. But more than reducing duplicate records, this kind of information matching or house holding is a powerful way to establish highly sophisticated customer networks. By linking customers who share a name, address, account number or other user-specified commonality, organizations can begin to ascertain a customer's total sphere of influence and to formulate a complete view of the customer's wealth and potential for wealth. This type of house holding can include linking individuals to other individuals and individuals to corporations. For example, a financial services institution implementing a marketing and service campaign targeting its premier clients would want to understand the customer's entire relationship with the bank, including personal accounts, business holdings and any custodial or trust accounts associated with the customer. This total view of the customer's network provides the institution with a much richer understanding of how best to market to and service this premier client. Without understanding the extent of this individual's relationship, the institution would likely not target this client as part of its premier campaign, losing the opportunity to realize the benefits of its CRM strategy. Building more sophisticated networks also provides manufacturing organizations with a better view of their business partners, as well as their customers. Corporate house holding allows the manufacturer to build hierarchical relationships with the different business entities of a single supplier. For example, Acme Manufacturing may make purchases from Division

A, Division B and Division C of parent company Global Supplier. Yet, each division, as well as the parent company, may be based in different locations and do business under different names. If the manufacturer can link the divisions to the parent, it can begin to understand the total amount of business it transacts with this single corporate entity. This puts the manufacturer in a much better position to negotiate volume discounts with the parent company. These discounts can then be applied to the various division-level purchases. In the case of automotive manufacturers, establishing the customer's identity can be a complex proposition. Customers can be the dealers who sell the cars or the individuals who buy the cars. However, there is a hierarchical relationship in these customer networks that the automotive company cannot afford to overlook: the end-client "belongs" to the company, as well as to the dealer. To establish effective marketing and service strategies for either the dealer or the end-client, the automotive company must first understand the relationship that exists between the dealer and the end-client, as well as the relationship that the end-client and the dealer each share with the automotive company. These are sophisticated relationship networks that go beyond linking on common name and address. Implementing the necessary conversion rules for correcting errors and establishing customer networks requires more than software. It also requires an understanding of the organization's business rules. Only with that knowledge is the company ready to use software that includes built-in business rules for information quality processing. These pre-configured solutions can save an organization substantial time and money when compared to the more laborious and error-prone method of manual cleansing or when compared to software that requires the organization to build all of the necessary business rules for conversion from scratch. By taking advantage of intelligent solutions that provide comprehensive sets of universal information quality transformation rules, organizations can focus on building only the rules that are truly unique to their business. This approach allows organizations to accelerate the implementation of their CDQ programs.

- *Information Quality Maintenance* Best practitioners of CDQ won't stop once they've completed the initial information analysis, information conversion and information cleansing. Ongoing information quality processing is necessary to maintaining the integrity of any CRM system. Changes are constantly being made and new information is always being introduced into the system from various sales channels, including and especially the Web. The Web presents a special challenge to information quality maintenance because the responsibility for information input lies more with the e-customer and less with the organization. According to the U.S. Department of Commerce, in 2000, more than 58 million U.S. consumers engaged in online transactions, generating $28.5 billion in sales. As e-commerce continues to grow, organizations committed to CRM increasingly will need to ensure that information is clean as it comes into the organization from the Web. Organizations that value their customer information will place a information quality filter at all customer interaction touch points, including the Web. This filter is the organization's defense against customer information corruption. After the CRM system is populated with cleansed and linked information, organizations will want to focus their preventative information quality measures on the front-line, rather than on more costly and time-intensive back-office clean-up. Just as business rules were critical to the conversion, information quality filters must be flexible and robust enough to support the organization's established business rules. This consistency will ensure the organization's information quality conversion efforts are maintained going forward.

## V. Information Security Management System and the Creation of Security Policies in CRM Systems

Evidently, in modern digital economy, information is the lifeblood of business and organisations are increasingly dependent on the use of information systems and networks to process information. Computer 'literacy' is now widespread making systems ever more open to abuse, whether deliberate or accidental. Consequently, businesses are increasingly at risk through use of the very tool introduced to increase efficiency, i.e. information technology (IT). Managers must therefore address these risks where they would affect their systems and the information used on them in terms of: (George, 2008).

- confidentiality
- integrity
- availability.

Security requirements are identified by a methodical assessment of security risks. Expenditure on controls needs to be balanced against the business harm likely to result from security failures. The results of the risk assessment will help to guide and determine the appropriate management action and priorities for managing information security risks, and for implementing controls selected to protect against these risks. Risk assessment should be repeated periodically to address any changes that might influence the risk assessment results. If managing an organization's

information security risks quality, the most important is to choose the best methodology.

In the increasingly interconnected business environment, information is an asset that, like other important business assets, is essential to an organization's business and consequently needs to be suitably protected. As a result of this increasing interconnectivity, information is now exposed to a growing number and a wider variety of threats and vulnerabilities. Information can exist in many forms: it can be printed or written on paper, stored electronically, transmitted by post or by using electronic means, shown on films, or spoken in conversation. Whatever form the information takes, or means by which it is shared or stored, it should always be appropriately protected. It is important to stress that information security is the protection of information from a wide range of threats in order to ensure business continuity, minimize business risk, and maximize return on investments and business opportunities.

In organisation environment, information security is achieved by implementing a suitable set of controls, including policies, processes, procedures, organizational structures and software and hardware functions. These controls need to be established, implemented, monitored, reviewed and improved, where necessary, to ensure that the specific security and business objectives of the organization are met. This should be done in conjunction with other business management processes. Information security policy3 in accordance with the application of ISO 27001:20054 4.2.1 b must be defined as follows: "The organization must do the following:"(https://bib.irb.hr/datoteka/-514103.285-883-1-PB1.pdf)

- Define the scope and limits of ISMS in terms of business features, organization, its location, assets and technology including details and justification of any exclusions from the scope
- Define the ISMS policy in terms of features, business, organization, its location, assets and technology that:

- includes a framework for setting goals and establishing overall sense of direction and principles for acting in relation to information security,
- takes into account the business and legal or regulatory requirements and contractual obligations related to security,
- it is consistent with the organizational context of strategic risk management within which will be made the establishment and maintenance of ISMS;
- establishes the criteria by which risks will be evaluated is approved by management.

## VI. Conclusion

As it is shown, consistency and quality of CRM data are crucial for business success. In order to prevent incorrectness of data, enterprises develop strategy and goals of data quality. Enterprises use descriptive, behavioral and contextual data types to effectively manage their customer relationships.

Factors which ensure consistent high data quality are represented by six-step approach including: data profile and context, data control, data integration and storage, data augmentation, data monitoring, assigning ownership, users training and commitment to data-quality process.

## References Références Referencias


1. Anderson, J. C. & Narus, J. A. (1991, Spring) "Partnering as a Focused Market Strategy." California Management Review, pp. 95-113.
2. Ballou, D.P. and Pazer, H.L. (1990), A framework for the analysis of error conjunctive, multi-criteria, satisfying decision processes, Decision Sciences, 21(4), pp. 752-770.
3. Berry, L. L. (1995, Fall) "Relationship Marketing of Services--Growing Interest, Emerging Perspectives." Journal of the Academy of Marketing Science, pp. 236-245.
4. Berry, L. L. & Parsuraman, A. (1991) Marketing Services – Competing Through Quality, New York: Free Press.
5. Bickert, J. (1992, May) "The Database Revolution." Target Marketing, pp.14-18.
6. Cushing, B.E. (1974), A mathematical approach to the analysis and design of internal control systems, The Accounting Review, 49(1), pp. 24-41.
7. Bitner, M. J. (1995, Fall) "Building Service Relationships: It's All About Promises." Journal of the Academy of Marketing Science, pp. 246-251.
8. Crosby, L. A. & Stephens, N (1987, November) "Effects of Relationship Marketing and Satisfaction, Retention, and Prices in the Life Insurance Industry." Journal of Marketing Research, pp. 404-411.
9. Crosby, L. A., Evans, K. R., & Cowles, D (1990, April)" Relationship Quality in Services Selling--An Interpersonal Influence Perspective." Journal of Marketing, 52, 21-34.
10. Dick, A. S. & Basu, K. (1994, Spring) "Customer Loyalty: Toward an Integrated Conceptual Framework." Journal of the Academy of Marketing Science, 22, 99113.
11. Deming, W.E. (1982), Out of the crisis, MIT Press, Boston, Massachusetts, USA. Dickson, G., Senn, J. and Chervany, N. (1977), Research in management information systems: the Minnesota experiments, Management Science, 23(9), pp. 913-923.
12. Doyle, S. X. & Roth, G. T. (1992, Winter) "Selling and Sales Management in Action: The Use of Insight Coaching to Improve Relationship Selling." Journal of Personal Selling & Sales Management, pp. 59-64.

13. Dwyer, F. R., Schurr, P. H., & Oh, S. (1987, April) "Developing Buyer-Seller Relationships." Journal of Marketing, 51, 11-27.
14. Eppler, M. J., (2006), Managing Information Quality, 2nd edition, Publisher: Springer. Berlin, Germany.
15. Eppler, M. and Helfert, M. (2004), A classification and analysis of data quality costs, 9th International Conference on Information Quality, Boston, Massachusetts, USA.
16. Fisher, C.W. and Kingma, B.R. (2001), Criticality of data quality as exemplified in two disasters, Information & Management, 39(2), pp 109-116.
17. Frazier, G. L., Spekman, R. E., & O'Neal, C. (1988, October) "Just-in-Time Exchange Systems and Industrial Marketing." Journal of Marketing, 52, 52-67.
18. George Fratian, Planning your CRM SAP Implementation, Galileo Press, 2008.
19. Gilmore, H.L. (1974), Product conformance cost, Quality Progress, 7, pp. 16-19.
20. Gronroos, C. (1983) Strategic management and marketing in the service sector. Marketing Science Institute. Massachusetts, USA.
21. Gummesson, E. (1987, August) "The New Marketing- A Developing Long-Term Interactive Relationships." Long Range Planning, pp. 10-20.
22. Janson, M. (1988), Data quality: the Achilles heel of end-user computing, OMEGA: International Journal of Management Science, 16(5), pp. 491-502.
23. Jill Dyche, CRM Handbook A Business Guide For CRM Customers, Addison Wesley IT Series, 2004.
24. Juran, J.M., Gryna, F.M. and Bingham, R.S. (1974), Quality Control Handbook, 3rd edition, McGraw-Hill, New York, USA.
25. Levitt, T. (1983, September-October), "After the Sale is Over." Harvard Business Review, pp. 87-93.
26. Olson, J.E. (2003), Data quality: the accuracy dimension, Publisher: Morgan Kaufmann, San Francisco, California, USA.
27. McKenna, R. (1991) Relationship Marketing: Successful Strategies for the Age of the Customers. Addison-Wesley.
28. Morgan, R. M. & Hunt, S. D. (1994) "The Commitment-Trust Theory of Relationship Marketing." Journal of Marketing, 58 (3), 20-38.
29. Naidu, G. M., Parvatiyar, A., Sheth, J. N., & Westgate, L. (1999) "Does Relationship Marketing Pay? An Empirical Investigation of Relationship Marketing Practices in Hospitals." Journal of Business Research, 46 (3), 207218.
30. O'Neal, C. R. (1989, February) "JIT Procurement and Relationship Marketing." Industrial Marketing Management, 18, 55-63.
31. Paul, T. (1988) "Relationship Marketing for Health Care Providers." Journal of Health Care Marketing, 8, 20-25.
32. Peppers, D. & Rogers, M. (1993) The One to One Future: Building Relationships One Customer at a Time. New York: Doubleday.
33. Shapiro, B. P. & Moriarty, R. T., Jr. (1980) National Account Management. Cambridge, MA: Marketing Science Institute.
34. Shapiro, B. P. & Posner, R. S. (1979, March-April) "Making the Major Sale." Harvard Business Review, pp. 68-79.
35. Sheth, J. N. & Sisodia, R. S. (1995) "Improving Marketing Productivity." In J. Heilbrunn (Ed.), Encyclopedia of Marketing in the Year 2000. Chicago, IL: American Marketing Association/NTC Publishing.
36. Wang, R.Y. and Strong, D.M. (1996), Beyond accuracy: what data quality means to data consumers. Journal of Management Information Systems, 12(4), pp. 5-34.
37. Wang, R.Y. (1998), A product perspective on total data quality management, Communications of the ACM, 41(2), pp. 58-65.