Customer relationship management: key components for IT success

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Abstract
This article is directed towards information technology (IT) and marketing managers considering implementation of a customer relationship management (CRM) solution. The goal of this article is not to provide an inclusive tutorial on CRM, but rather to provide a high level insight of the fundamental principles behind CRM and critical aspects of the IT development process. The article begins with an IT manager's introduction into the basic CRM business and marketing principles. At the heart of the article is a proposed system development lifecycle that highlights the aspects unique or critical to CRM. Finally, it concludes with some final thoughts for long-term success. After reading this article, the reader will be mindful of the major issues needed for success and be equipped to discuss primary development matters with vendors, staff and management.

What is CRM?
One of the most dynamic information technology (IT) topics of the new millennium is the area of customer relationship management (CRM). At the core, CRM is an integration of technologies and business processes used to satisfy the needs of a customer during any given interaction. More specifically, CRM involves acquisition, analysis and use of knowledge about customers in order to sell more goods or services and to do it more efficiently. It is important to note that the term “customer” may have a very broad definition that includes vendors, channel partners or virtually any group or individual that requires information from the organization.

In IT terms, CRM means an enterprise-wide integration of technologies working together such as data warehouse, Web site, intranet/extranet, phone support system, accounting, sales, marketing and production. CRM has many similarities with enterprise resource planning (ERP) where ERP can be considered back-office integration and CRM as front-office integration. A notable difference between ERP and CRM is that ERP can be implemented without CRM. However, CRM usually requires access to the back-office data that often happens through an ERP-type integration.

CRM principally revolves around marketing (Kotler, 1997) and begins with a deep analysis of consumer behavior. It uses IT to gather data, which can then be used to develop information required to create a more personal interaction with the customer. In the long-term, it produces a method of continuous analysis and refinement in order to enhance customers’ lifetime value with the firm. Wells et al. (1999) noted, “both [marketing and IT] need to work together with a high level of coordination to produce a seamless process of interaction”. However, in order to work effectively with marketing, IT managers need an understanding of the fundamental marketing motivations driving the CRM trend.

CRM marketing
Long ago, businesses were well adapted to managing customer relationships; the old mom-and-pop grocery store is a good example. Customers were greeted by name; staff knew exactly what each customer ordered, what things they preferred, and how likely each customer would pay on time. As a firm’s knowledge of marketing “advanced”, the needs of any one customer were lost in exchange for a more efficient trend known as a marketing orientation (Prize and Ferrell, 1999). A notable result of the marketing orientation is what is now coined as customer segmentation. Segmentation is essentially aggregating customers into groups with similar characteristics such as demographic, geographic or behavioral traits and marketing to them as a group. Consequently, each member of the segment has similar needs and wants; however, they are not completely uniform. The result was that customers often received most of what they wanted but still had to compromise on many desires.

This method was a cost-effective way to target groups of customers and proved to be a strong competitive advantage. However, after nearly five decades of use, customer segmentation is no longer the competitive advantage it once was and is now often considered a minimum requirement of doing business. In order to regain the competitive advantage, leading firms are now ushering in a new orientation that might be termed a customer-centric orientation (see Figure 1).

During the 1850s, businesses could sell almost anything they made. Consequently it was a seller’s market and businesses focused...
on production. Early in the 1900s, competition was creeping up and businesses realized customers wielded more power and firms had to find reasons for people to buy their products. This brought about a sales orientation. By the 1950s, businesses began to realize they had to make what people wanted instead of trying to convince them to buy whatever they had to sell, which ushered in the marketing orientation. The marketing orientation focused on addressing the needs of market segments. We are now at the beginning stages of a new customer-centric orientation.

A customer-centric firm is capable of treating every customer individually and uniquely, depending on the customer’s preference. As Berger and Bechwati (2000) put it, the “core of relationship marketing is the development and maintenance of long-term relationships with customers, rather than simply a series of discrete transactions.” They further note that a guiding principle is the management of a customer’s lifetime value (CLV). Rather than calculating profit from a discrete transaction, the firm must consider the value of a customer over his or her entire relationship with the firm.

Many are likely to argue that a customer-centric orientation is simply a subset of a marketing orientation and an extension of segmentation (down to a one-to-one relationship). The author of this article disagrees, in that companies will now fundamentally have to change the way in which they market their products – it is a fundamental shift from managing a market, to managing a specific customer. In a marketing orientation, firms were still very much in control of the marketing mix, in the future, firms will be driven more and more by individual customer preferences.

As an example of this trend, Levi’s can customize your next pair of 501 jeans, and perfumes and cosmetics can be quickly blended for specific users. Nearly everyone can imagine a car-buying experience where they had to purchase something they did not want, missed out on an accessory that was not available or both. Customers are forced to compromise because manufacturers make products for groups, not individuals. However, in this day and age, it is hard to accept why it is so difficult to get a car exactly as you want with so much technology available!

CRM was invented because customers differ in their preferences and purchasing habits. If all customers were alike, there would be little need for CRM. Mass marketing and mass communications would work just fine (McKim and Hughes, 2000).

In the future, the firms most successful will be the ones practicing CRM. Wells et al. (1999) summarizes the overall philosophy of CRM, by saying:

“... a one-to-one marketing paradigm has emerged that suggests organizations will be more successful if they concentrate on obtaining and maintaining a share of each customer rather than a share of the entire market, with IT being the enabling factor.

So, what is fueling this new shift in marketing? One word: Technology. Niche firms have always had a role in customizing products, but it is just recently that customization of products and services on a mass scale have become a realistic objective; thanks mostly to fast, low-cost, networked environments.

With the above discussion on the fundamental understanding of the business and marketing principles driving the CRM trend, let us now turn our attention to the IT manager’s role in creating the technical infrastructure.

**CRM development**

Creating a CRM solution for most companies is generally a matter of complex integration of hardware, software and applications. In addition, it requires a thorough analysis of business processes. Most companies can get excited about the idea of a fully implemented CRM, but the work involved to bring such a system to reality demands a great deal of diverse knowledge, project management and a thorough plan.

This section outlines a CRM development plan based on the typical life-cycle approach. It includes eight phases (see Figure 2), which we will cover individually.

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Because the overall development phases are standard for all systems, this article will focus on the areas that are unique to or require special attention for CRM. For example, Wells et al. (1999) has identified four key components for successfully reengineering IT systems for one-to-one marketing:

1. identify the means of collecting customer information;
2. re-design of data;
3. IT-enabled interaction; and
4. transmission of data.

These concepts, along with others, will be incorporated into the development phases detailed below.

**Phase 1: Planning**

Like many enterprise projects, CRM has to receive commitment from senior level management. Wells et al. (1999) suggest a complete business process analysis with whom it is profitable to establish one-to-one interaction and how business processes can be re-engineered to accommodate this interaction. In this phase it would be wise for management to consider the uniformity of their product offering and the value that customers will put on a “customized interaction” with the firm. Additionally, identifying how managers at various levels of the organization will use the information is critical. They suggest several components for such interaction, the author of this article has grouped these components into two categories:

1. customer interaction points; and
2. decision interaction points.

First, the firm must identify how, when and where it will be interacting with customers. The key is to initially identify all of these interaction points and, second, determine whether to retain, modify or remove the points. The IT manager should focus on how these interactions can be recorded into an information system. For example, a retailer may interact with a customer through a toll-free order line, help desk, Web site, with a salesperson at a local store, by mail or via a third-party partner. To provide a true customer-centric focus, employees of the firm need access to any and all information that will ensure a successful interaction. While delivering information to a call center may seem straightforward, providing that same information to a clerk at a retail store or a channel partner could be quite complex.

The second consideration is decision support. How will management at all levels use this information to improve the quality of their decisions? As with customer interaction points, here too, the company will need to identify the current decision-making processes and determine whether each should be maintained, modified or removed to accommodate the new customer-centric approach. Identification of critical decision-making data and required information is key.

**Phase 2: Research**

In the research phase the IT team needs to identify methods for addressing the needs of the organization within the CRM framework. It will be important to consider the firm’s current organizational structure, culture, possible hardware, software, vendors, suppliers, etc. A careful assessment of resources and market conditions is crucial.

**Phase 3: System analysis and conceptual design**

While no step in the CRM development life-cycle can be left out, careful and thoughtful planning is the most critical element. The system analysis phase combined with the previous planning phase are arguably the most important steps. Listed below are several critical factors that need to be considered during this phase.

**CRM IS customer interaction**

According to Wells et al. (1999), the objective is to provide all necessary information to a user in order to result in a successful interaction with the customer. There are two primary ways in which a CRM may interact with a customer:

1. IT-assisted; or
2. automated interaction.

IT-assisted (manual) – here an employee becomes the intermediary between the CRM and the customer (see Figure 3a). Usually in this case, the interaction between employee and customer is key and the CRM is a tool used to assist the employee. An example of such interaction is a telephone support center. Here a customer may call to check on billing, ask general questions, require support, etc. and would directly interact with a company representative (assisted by a CRM package).
Automated interaction – in this type of interaction, the customer is placed in complete control of the interaction (see Figure 3b). This would mean empowering the customer through technologies such as the World Wide Web, kiosks or automated phone systems. In this case, the customer would interact directly with the CRM.

A key concept in this phase of development is that the customer chooses the type of interaction; firms do not demand that the customer fit into their IT framework. Additionally, regardless of the method chosen by the customer, all information necessary to satisfy the customer should be delivered via that method. This does not mean that a firm has to make available every method of interaction to the customer. During the business process analysis mentioned earlier, the firm identified the types of contact points it will need to support the customer. IT will then design a way to facilitate that interaction.

Obtain outside expertise
Unless the company has had experience in CRM, or feels confident that it can assemble the needed technical and staffing resources for implementation, this would be an excellent point to begin talking with vendors and CRM consultants. There are two excellent reasons to consider partnering with vendors or consultants. First, most firms have scaled back IT departments so that they are only large enough to handle routine operations. Implementation of a CRM solution is likely to require additional outside technical staff. Second, selecting experienced vendors or consulting firms to assist in the project will help to ensure project success by reducing common problems and prioritizing tasks. Additionally, many vendors and consultants can assist with required business process changes and/or employee training.

Consider staging project
A benefit of CRM is that it can often be created in stages. Even if a company has resources available to completely re-engineer the company in a short time period, it might be more realistic to implement the system in stages starting with the core components. Some technologies such as data warehouse, data mining, integrated phone systems, and network upgrades are a virtual requirement for CRM and can be completed prior to implementing an actual CRM solution.

Re-design of customer data
IT departments usually have to re-evaluate the way data is stored in order to implement CRM. Such analysis includes three major CRM data issues:
1. integrating customer data across the entire firm;
2. expanding the customer data profile; and
3. integration with legacy systems.
Integrating data – Wells et al. (1999) points out that, traditionally, customer data has been fragmented by the firm’s organizational structure (see Figure 4). In order for CRM to provide any significant advantage to the firm, users and managers must be able to easily and quickly access disparate information. In order for a firm to practice a customer-centric focus, the data must also be customer centered. While it is likely most of these issues will be resolved with a data warehouse, it is important that the data within the warehouse be aligned by customer, and not by some other method such as functional area or product.

Additionally, great care should be taken to ensure the data is clean, and that appropriate procedures are implemented to ensure data integrity within the system. Finally, efforts should be taken to ensure the data be usable by other software systems that may be used by the firm such as Decision Support System (DSS), Executive Support System (ESS), and Expert System (ES). Without reliable and accurate data, a CRM will be of less value to a firm.

Expanding customer data profile – a second crucial aspect of re-designing customer data is expanding the customer data to include non-transactional information. Wells et al. (1999) noted that such data is equally, if not more, valuable than the transactional data. Such data may include general inquiries, support calls, suggestions, employee/

management comments, registration cards and complaints. This might also include alternative types of data in the form of faxes, video, e-mail and graphics.

Integration with legacy systems – is always a tricky matter as data is often structured around departments, functional areas, or some outdated method that is no longer used within the firm. Lim and Chiang (2000) discuss resolving relationship conflicts between database data when real-world relationships have changed and data has not. Their research indicates that restructuring must take place at both the top-level schema as well as specific data instances and provides a methodology for approaching the conversion.

Making the data available for decision making
An intimate interaction with the client is the major objective of CRM; however, we also want to use the information to make more enduring management decisions – decisions that will ultimately lead to even higher customer satisfaction. These types of decisions may include information about new product development, product changes, marketing mix factors, budgeting, scheduling and financial planning. Such information will not be available without clean, organized and accurate data.

Scalability
Because CRM is such a new technology, it is nearly certain that firms will be working overtime to keep up with changes. Given the enterprise scope and the evolving nature of CRM, it will be important to create a system that can be scaled to meet the changing needs of the future. Selection of hardware or software that have limited connectivity or scalability should be avoided.

Feasibility study
A CRM implementation is a major undertaking. A firm must ensure it has the proper resources as well as support from all departments, especially from senior management. It is important to remember at this stage that CRM may involve fundamental process changes within the organization; simply providing technology is usually inadequate.

Additionally, a CRM project can be quite expensive. Rosen (2000) indicated that 38 percent of current CRM users plan to spend more than $1 million on systems and final approval usually comes from the most senior management – 42 percent indicated the CEOs would have the final decision. Again, the emphasis is on a thorough, thoughtful plan that will likely be scrutinized by the highest level of management.
Phase 4: Design
Once the company has planned and determined the viability of the project, the next stage involves a detailed specification. Precise software packages must be selected along with the core technologies such as data warehouse, DSS, ES, and network architecture.

Given the early stages of CRM in the marketplace, there are no packages that can provide a complete CRM solution, integration of several different packages is a virtual requirement. Here again, the advice of an experienced consultant may be necessary to determine what types of modifications or middleware that may be necessary to link all of the systems. A common complaint seems to be the lack of easy integration between CRM and ERP packages.

Phase 5: Construction
This stage is the execution of the design plan. There is nothing particularly unique about CRM construction during this phase except for the fact that it is such a large task. Unless the project has been broken down into stages, many firms will have to rely on a vendor or consultant to assist in providing people and expertise to ensure a smooth transition.

Phase 6: Implementation
A critical component in the implementation phase is training. A CRM implementation may involve major IT and business process changes that all users must fully understand. Carlsson and Walden (2000) indicated that often, intelligent IT projects are doomed because of “people problems”. These people problems include:

- People have cognitive constraints in adopting intelligent systems.
- People do not really understand the support they get and disregard it in favor of past experience and visions.
- People cannot really handle large amounts of information and knowledge.
- People are frustrated by theories they do not really understand.
- People believe they get more support by talking to other people (even if their knowledge is limited).

A solid training program will go a long way in helping employees to understand not only the goal of CRM, but also to understand how the system will help to better serve the customer. While it seems obvious that training of line-level employees is required, it is equally important to thoroughly train managers who will be using the CRM to assist in decision making. This point is illustrated in a potential CRM paradox.

A CRM paradox
A fundamental principle of CRM is the collection of vast amounts of data. One purpose for collecting the data is that it allows managers access to a higher quality of information. This, in turn, will assist them in making better decisions. The CRM paradox is that this is not always the case – a higher quality of information may actually create poorer decisions!

Raghunathan (1999) concluded:
The decision quality improves with higher information quality for a decision maker that has knowledge about the relationships among the variables. However, the decision quality of a decision maker that doesn’t know these relationships may degrade with higher information quality.

While his article is very theoretical, the conclusions do lead to a commonsense outcome. The lesson for IT is that it is important to provide thorough training to decision makers both on the use of the CRM and in the interpretation of any resulting information. Otherwise, managers could possibly press a few buttons inadvertently which could result in a screen of potentially misleading information.

Expertise in data mining
For many of the same reasons that the CRM paradox exists above, it is also essential that the staff using software to conduct data mining activities have a reasonable level of expertise in such activities. Feelders et al. (2000) noted:
Successful data mining projects require the involvement of expertise in data mining, company data, and the subject area concerned. Despite the attractive suggestion of fully automatic data analysis, knowledge of the processes behind the data remains indispensable in avoiding the many pitfalls of data mining.

While some of the tools used in a CRM project may seem to generate amazing information, the results must not be taken for granted. Training that includes both fundamental analysis and software operation will be critical for those using the tools to assist in high-level decision making.

Phase 7: Maintenance and documentation
Maintenance is an important phase, since a company must always be seeking to learn more about its customers. Because the marketplace is dynamic, CRM requires continual evaluation of the system performance; and data quantity and quality. IT should continuously work with other
functional areas such as marketing, management and production to ensure that the system is meeting the needs of the decision makers in the firm.

**Phase 8: Adaptation**

This is a critical component as CRM is still in its infancy. As a company learns more about its customer (through use of the CRM system), it will change. In the past, adding a new product or sales channel may have only meant minor changes for an IT department. However, a new sales channel or product may alter the customer interaction points or the types of data that need to be collected. If IT fails to make changes, the company will quickly lose the competitive edge of the customer-centric orientation.

**Additional components for success**

Finally, there are two additional components for IT success that do not fit neatly into the system development life-cycle. They include the role of the high-level DSS in CRM and identification of firms who are most likely to benefit from CRM implementation.

**The role of DSS in CRM**

CRM has evolved from a basic transaction processing system to a powerful decision support tool. The role of DSS in CRM projects can range from simple to complex, depending on the needs of the firm and the ability of the IT department to integrate all of the complex technologies together. Because of the vast amount of data collected and the centralization of data, virtually any DSS-related technology could be integrated. For example, an expert system might be found in a call center, ESS found on the desk of senior management or a DSS used by marketing or senior management to develop new products or marketing strategies.

Currently, standard CRM packages have only scratched the surface of management support possibilities. IT will need to look beyond the current offerings of just one or two vendors. While CRM and related technologies have empowered us to gather lots of information, Nasi (1998) notes that interaction with customers is still a fundamental part of making strategic decisions. While CRM systems can assist managers in making good decisions, CRM is not yet, and is unlikely to be, a replacement for traditional decision making, management instinct and experience.

**Who should use CRM?**

Potentially, most firms can make use of CRM technology, but there are certainly some that are better suited for CRM than others. A recent issue of the Harvard Management Update (2000) identifies companies who are most likely to benefit from CRM and those who are less likely:

- **Most likely to benefit** are companies who “accumulate lots of data on each customer’s buying patterns in the course of their business”; for example, financial or telecommunications companies.

- **Least likely to benefit** are businesses where the consumer is not in contact with the marketers, where the lifetime value of a customer is low, or businesses with huge customer churn. It is important to note, though, that some of these problems might actually be overcome with a better understanding of the customer via the use of CRM.

Additionally, the article emphasizes the differentiation of the consumer needs as well as a good understanding of the lifetime value of a customer to the firm (see Figure 5). Essentially, firms with customers whose need and value are very uniform will receive less benefit from CRM (i.e. a gas station, quadrant I). Whereas, those firms whose customer needs and product value are highly differentiated (i.e. pharmacies, quadrant IV) will receive the most benefit.

**The future of CRM**

Where will CRM be headed in the near future? While no one can predict the future with certainty, there seems to be three trends that will be driving CRM in the near term:

1. extension of CRM to channel partners;
2. added visual tools; and
3. a trend towards industry consolidation and partnering.

**Extend CRM to channel partners**

CRM already is capable of integrating companies horizontally and vertically as long as the chain is a single firm. However, firms can benefit from increased sharing of information between each other. Papazoglou et al. (2000) said:

Unlike previous decades where enterprises prized independence, the next decade will be one of business alliances and competing, end-to-end value chains. Enterprise value chains comprised of powerful business alliances partners will exceedingly compete as single entities for customers.
Currently, integration within a single organization is quite complicated and extending the integration to another firm would be difficult today. Papazoglou et al. (2000) provide a framework for such integration that includes integrating business processes and introducing additional middleware.

Angeles and Nath (2000) agree, noting that the quantity of suppliers in the chain is a critical factor for integration:

- Highly-integrated supply chain management (SCM) and accompanying logistics services have now become the basis of competition in the increasingly electronic and Web-driven marketplace.

Rackham (2000) has also elaborated as to why the channel relationships are so important:

- The expert consensus now is that you can’t choose channels for reaching customers; your customers will choose their channels for reaching you. And, most likely, they will want every single channel that your competitors could possibly offer them.

Kim (2000) has even developed quantitative models to analyze the value of the supplier—manufacturer relationship. It is not surprising to learn that each channel member must play a role in the value chain in order to maintain a successful relationship with each other.

CRM can provide a substantial competitive advantage to most firms. However, as more and more firms implement such systems, the advantages will begin to decrease. The next logical step will be to extend the technology to business partners within the product value chain in the expectation that sharing the information will make all channel partners more competitive.

**More visual tools**

Interpreting data and relationships between data can be difficult, especially when you are analyzing “soft” data such as consumer preferences and marketing effectiveness. New visual tools specifically for analyzing large data warehouses are now more widely available (Whiting, 2000). Previously, database administrators had to tediously pull names from the database using SQL queries. Most visual tools go quite a bit further than traditional OLAP technologies.

**Consolidation of CRM vendors**

Integration of a complete CRM solution can be a daunting task given the large number of packages and the diverse vendors that IT managers must coordinate with. Waltz (2000) discusses the massive scale of vendor consolidation within the CRM industry. Every company is seeing the value of CRM. Companies offering “core technologies” such as Oracle, Lucent and Cisco, are acquiring or partnering with CRM specific vendors to ensure smooth integration of both hardware and software – which is good news for IT managers!

**Conclusion**

Predicting the future of CRM is a bit like picking which country will win the next World Cup soccer. While there is some past
history to consider, there are no sure bets. The biggest threat to CRM is managements' focus on short-run profits rather than long-term vision. CRM is an expensive, time-consuming and complex proposition. Even in the best case, CRM requires a certain "leap of faith" by a firm, as technology is still not available to completely develop the full power of a customer-centric approach. In addition, there are those who believe that even if the full potential is achieved, it might not be enough to justify the staggering costs that some firms have invested in present-day CRM.

There is one thing for certain, and that is the fact our world is rapidly changing and competition for each customer’s dollar is intense. Consequently, firms are becoming frustrated by competing with only minor advantages and gimmicks that are easily assimilated by competitors. CRM is an opportunity to rise above minor advantages and develop an actual relationship with your customers. It is not simple, but no enduring advantage is. Companies that are the most successful at delivering what each customer wants are the most likely to be the leaders of the future.

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