Research Papers 2

Customer Relationship Management (CRM): A Technology Driven Tool

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Introduction

Customer Relationship Management (CRM) is a management approach that seeks to create, develop and enhance relationships with carefully targeted customers in order to maximize customer value, corporate profitability and thus shareholders' value. Managing relationship with the customers has been of importance since last many centuries, but with invent of information technology a new discipline in name of CRM has emerged. The CRM is primarily concerned with utilizing information technology to implement relationship marketing strategies. The emergence of CRM is a consequence of a number of trends like shift in business focus from transactional to relationship marketing, transition in structuring organizations on a strategic basis from functions to processes, and acceptance of the need for trade-off between delivering and extracting customer value. The greater utilization of technology in managing and maximizing value of information has also led to modern shape of CRM.

The aim of CRM is to acquire and retain customers by providing them with optimal value in whatever way they deem important. This includes the way businesses communicate with them, how they buy, and the service they receive - in addition, of course, getting the best through the more traditional channels of product, price, promotion and place of distribution. Essentially, CRM is a customer focused business strategy which brings together customer lifecycle management, business process and technology. The trend for companies to shift from a product focused view of the world to a customer focused one is the modern strategy of the business, as products become increasingly hard to differentiate in fiercely competitive markets. It stands to reason that the better one understands customers, the more successful the company will be in meeting their needs. But adopting a truly customer focused approach can be a resource intensive business. Many managers have questioned how far the investment is worth it. The answer to such questions lies in CRM which uses new technologies that can transform the technique of cultivating a loyal customer base.

Customer as Partner

In to-day's world true relationship marketing practices require a fundamental shift in

attitude towards viewing the customer as a partner and a business asset to be managed for long-term profitability. The sale should not be viewed either as a conquest or as the end of the marketing process; rather it should be constructed as the beginning of a relationship. The information technology, which includes the telecommunications, data storage and retrieval technologies, and the World Wide Web, have created a revolution that has shifted the business firm's orientation from production efficiency back to the customers' needs. IT could draw the customer closer to the company, build a relationship, and reduce the probability of customer defection.

With technology touching the way we live our lives, expectations of individuals is fast changing. Just like television and the PC's have revolutionized our lives so is wireless communications, Internet and pervasive computing going to affect our daily pattern of lives. Some trends that have bearing on treating customers as partners can be seen as:

- More and more individuals will like to be treated as one single person rather than as one among the masses.
- People wish products and services round the clock
- With abundance of product and service offerings, consumer's loyalty can only be commanded by providing better portfolio of services.
- Speed of response and understanding each individual one of the major key issues

Importance of Technology in Customer Relationship

IT is enabler and choosing right technology is managerial acumen. First one has to find out initiatives which need improvements through technology, Identifying these initiative is one of the key tasks of a manager. In the context of CRM, initiatives which need improvement and applicability of IT are shown in Exhibit 1.

Exhibit 1: Importance of Technology to initiative

Initiatives to improve	Importance of IT to initiative	Requirements of customer-relationship-management system
Targeting of profitable customers	very high	Introduce propensity modeling-for example, rule-based systems to improve capture of most important customer variables
Ability to deal with follow-up contacts	High	Create campaign library with history of offers made to targeted customers; make available on-line to call-center agents
Convenience of response	High	Enable response through convenient channels such as e-mail or, for mobile-phone users, Short Message Service (SMS)
Delivery of offer	High	Automate delivery of successive messages to customers who have not yet responded
Presentation of offer (sales pitch, material)	Low	Introduce sales scripts for call-center agents; employ support systems that help customize scripts by customer segment
Attractiveness of offer	None	N/A

Success of CRM is dependent upon the choosing the activity that involves data handling, complex modelling and requires lesser subjectivity/human intervention.

Technological Tools

The application of technology is the most exciting, fastest growing, and changing the way customers get information about products and services. Technology includes all of the equipment, software, and communication links that organizations use to enable or improve their processes, including everything from simple overhead transparency projectors to laptop computers, from fax machines to email, from audiocassette and videocassette players to cellular phones and voice mail(Stowell,1997)1.The most widely used tools are :

1) **Electronic Point of Sale (EPOS) :** The main benefit of EPOS and retail scanner systems is the amount of timely and accurate information they deliver. Advances in the technology have significantly aided the scope for data analysis. IN addition to the original scanner-related data on sales rate, stock levels, stock turn, price and margin, retailers now have information about the demographics, socio-economic and lifestyle characteristics of consumers. They can, in addition, assess the impact of a whole host of variables-price, promotion, advertising, position in store, shelf position, number of facings, and so on. This information drives their choice of product mix, allocation of shelf space and promotional tactics. EPOS has certainly changed the relationship between buyer and seller (Shipley and Palmer, 1997)[2].

2) **Sales Force Automation :** These systems help in automating and optimizing sales processes to shorten the sales cycle and increase sales productivity. They enable the company to track and manage all qualified leads, contacts, and opportunities throughout the sales cycle including customer support. They improve the effectiveness of marketing communications programs for generating quality leads as well as greater accuracy in sales forecasting. The Internet can be used by the company in imparting proper training to its sales force. In-depth product information, specialized databases solutions, sales force support queries, and a set of internal information on the Internet can improve the productivity of the sales force.

3) **Customer Service Helpdesk :**These applications help the company in automating the customer support processes, which enable it to deliver high quality service to their customers. Such software helps in logging the information about customers, enquiries, and suggestions, etc. It also helps in directing these queries to appropriate employees within the company. It maintains information regarding status of customer enquiries and stores all support calls and related communications to final resolution, continually updating the database accordingly. With an automated customer service, a company can reduce the costs of maintaining its customer service department while at the same time improving the level and quality of customer service. Customer service using the web provides more information and tools in the

hands of customers, which enhances customer benefits by allowing them to learn more about the product and improving their skills in using the product.

4) **Call Centers :** Call centre helps in automating the operations of inbound and outbound calls generated between company and its customers. These solutions integrate the voice switch of automated telephone systems with agent host software allowing for automatic call routing to agents, auto display of relevant customer data, predictive dialling, self-service interactive Voice Response systems, etc. These systems are useful in high volume segments like banking, telecom and hospitality. Today, more innovative channels of interacting with customers are emerging as a result of new technology, such as global telephone based call centres and the Internet. Companies are now focusing to offer solutions that leverage the Internet in building comprehensive CRM systems allowing them to handle customer interactions in all forms.

Systems Integration

While CRM solutions are front office automation solutions, ERP is back office automation solution. An ERP helps in automating business functions of production, finance, inventory, order fulfillment and human resource giving an integrated view of business, whereas CRM automates the relationship with a customer covering contact and opportunity management, marketing and product knowledge, sales force management, sales forecasting, customer order processing and fulfillment, delivery, installation, pre-sale and post –sale services and complaint handling by providing an integrated view of the customer It is necessary that the two systems integrate with each other and compliment information as well as business workflow. Therefore, CRM and ERP are complementary. This integration of CRM with ERP helps companies to provide faster customer service through an enabled network, which can direct all customer queries, and issues through appropriate channels to the right place for speedy resolution. This facilitates the company in tracking and correcting the product problems reported by customers by feeding this information into the R&D operation via ERP.

CRM Process Framework

Technological advancements in the recent times have enabled business organizations to automate their processes. This has resulted in greater profits through cost reduction in costs cycle time and workforce. CRM technologies enable an organization to present a single point of contact to its customers. CRM is a broad term encompassing many strategies, processes and technologies all working in tandem to get as close to the customer as possible. In order to have healthy relationship with its customers the company needs to monitor its customer's behaviors in each transaction and provide them what they want.

The Meta Group uses the CRM architectural framework to analyze where the different solutions fit in from holistic perspective. CRM process framework has three

primary components *operational* or process Management technologies, *analytical* or performance management technologies required to achieve a balanced CRM approach."(Source: SAS white paper)[3] and *collaborative*.

1) Operational : CRM solutions involve integration of business processes involving customer touch points. These technologies reside in those parts of a company where moments of truth occur i.e. a customer makes direct contact with the employees of the company. Typical CRM solutions that fit into this category are customer sales and service, sales force automation, marketing automation and field services. The back office side of the operational CRM solutions should be able to plug into ERP systems and chain management software.

2) Analytical : CRM analysis the data created on the operational side of the CRM effort for the purpose of business performance management and improvement. Prediction of customer behavior, identifying relevant customer segments, identifying potential customers etc are some of the activities that could be performed from the knowledge arising out of analytic CRM efforts.

3) Collaborative : CRM involves the facilitation of collaborative services (such as email) to facilitate interactions between customers and employees. All this effort produces rich data that feeds the Analytical CRM technologies. It analyses the data using data mining and other technologies and in turn feeds the result (i.e. knowledge gained) back to the operational and collaborative CRM technologies

Exhibit 2: Interactions with CRM Technologies

Customer Relationship Management is a technology initiative that aims to strengthen the front-end operations and build a mutually valuable long-term relationship with the customers. A firm might enjoy competitive advantage of its customers for a long time by building mutually beneficial relationships that increase switching costs and thus cannot be easily replicated. Studies have also shown that it costs as much as five times to acquire a new customer than to retain one. All customers do not contribute equally to a firm's profitability-some positively while others contribute negatively to the firm's bottom line. It is the endeavor of a firm to nurture these profitable customers. CRM integrates all front-end operations of the firm so that a customer is presented with a single point of contact that remembers all as the past customer interactions.
A typical CRM cycle consists of front-end operations that interact with the customer

(like call centers, target marketing initiatives etc.) and obtain data about customer. This is typically consolidated from various contact points and fed into a data warehouse. The data warehouse consolidates not only transaction data but also data obtained from outside sources like census data and provides a fertile ground for analysis. Data analysis is done by data mining methods. The output is interpreted and new knowledge is transferred to a central customer repository where all employees of the firm might access it. This helps them to customize responses. Thus, data mining provides the intelligence behind the CRM initiative.

Database Marketing

The important aspect in database marketing is to understand the customer in a comprehensive manner, and for that the company should maintain a proper customer database. The customer database is an organized collection of comprehensive information about individual customers or prospects that is current, accessible and actionable for such marketing purposes as lead generation, lead qualification and sale of a product or service or maintenance of customer relationships. In short Database marketing is the technique of gathering all the information available about the customer, leads, and prospects into a central database and using that information to drive all the marketing efforts. The information is stored in a marketing database and can be used at both the strategic and tactical levels to drive targeted marketing efforts.

Robert Shaw of Arthur Andersen Consulting[4] defines database marketing as an interactive approach to marketing communication, which uses addressable communications media (mail, telephone, fax, sales force etc) to extend help to its target audience, to stimulate their demand, and stay close to them by recording and keeping an electronic database memory of customer, prospect and all communication and commercial contacts, to help improve all future contacts.

The growth of database marketing has been facilitated by:

- The powerful processing capability and the immense storage capacity of the state of the art computers
- The manner in which the telecommunication technology is harnessed to make the customer and market data available to the wide variety of staff involved in the marketing and sales office.

Data Warehouse and Data Mining

The market savvy companies are all the more enthusiastic in capturing information from a customer, every time he comes into contact with any of its departments. The touch points include: the customer purchase, customer requested service call and online query or mail in rebate card.

A data warehouse is a subject-oriented, time varying, non-volatile collection of data that is primarily used in organizational decision making (Chaudhari and Dayal, 1997)[5]. Although physically not different from traditional databases, they are maintained

primarily for the purpose of decision support. "Every data warehouse has architecture," says Warren Thornthwaite, a partner with Menlo Park, CA-based Info Dynamics LLC. "It's ad hoc or planned; implied or documented. Unfortunately, many warehouses are developed without an explicit architectural plan, which severely limits flexibility." Without architecture, subject areas don't fit together, connections lead to nowhere, and the whole warehouse is difficult to manage and change. In addition, although it might not seem important, the architecture of a data warehouse becomes the framework for product selection.

Laura Hadley[6] describes data warehouse architecture as a description of the elements and services of the warehouse, with details showing how the components will fit together and how the system will grow over time. There is always architecture, either ad hoc or planned, but experience shows that planned architectures have a better chance of succeeding. Complete data warehouse architecture includes data and technical elements. Thornthwaite breaks down the architecture into three broad areas. The first, data architecture, is centered on business processes. The next area, infrastructure, includes hardware, networking, operating systems, and desktop machines. Finally, the technical area encompasses the decision-making technologies that will be needed by the users, as well as their supporting structures.

Data Architecture

The data architecture portion of the overall data warehouse architecture is driven by business processes. For example, in a manufacturing environment the data model might include orders, shipping, and billing. Each area draws on a different set of dimensions. But where dimensions intersect in the data model the definitions have to be the same—the same customer who buys is the same that builds. So data items should have a common structure and content, and involve a single process to create and maintain.

Infrastructure Architecture

With the required hardware platform and boxes, sometimes the data warehouse becomes its own IS shop. Indeed, there are lots of "boxes" in data warehousing, mostly used for data bases and application servers. The issues with hardware and DBMS choices are size, scalability, and flexibility. In about 80 percent of data warehousing projects this isn't difficult; most businesses can get enough power to handle their needs. In terms of the network, check the data sources, the warehouse staging area, and everything in between to ensure there's enough bandwidth to move data around. On the desktop, run the tools and actually get some data through them to determine if there's enough power for retrieval. Sometimes the problem is simply with the machine, and the desktops must be powerful enough to run current-generation access tools. Also, don't forget to implement a software distribution mechanism.

Technical Architecture

The technical architecture is driven by the meta data catalogue. "Everything should be meta data-driven," says Thornthwaite. "The services should draw the needed parameters from tables, rather than hard-coding them." An important component of technical architecture is the data staging process, which covers five major areas:

- ***Extract -*** data comes from multiple sources and is of multiple types. Data compression and encryption handling must be considered at this area, if it applies.
- ***Transform -*** data transformation includes surrogate key management, integration, de-normalization, cleansing, conversion, aggregation, and auditing.
- ***Load -*** loading is often done to multiple targets, with load optimization and support for the entire load cycle.
- ***Security -*** administrator access and data encryption policies.
- ***Job control -*** this includes job definition, job scheduling (time and event), monitoring, logging, exception handling, error handling, and notification.

Thus data warehouse aids in critical decision support by consolidating and integrating crucial customer information along with other information. Recent advances in data gathering and data storage technologies, along with the steep fall in prices have made it possible for companies to gather and store large amounts of data. Large companies are generating gigabytes of data daily through their daily transactions which require different data analysis approaches adopted earlier like artificial intelligence etc .This has given birth to the field of Knowledge Discovery in Databases (KDD) more popularly known as Data mining.

Data mining is an activity that provides intelligence to the CRM initiative .It is not just execution of exotic data extraction algorithms but a process (Brachman and Anand, 1996)[7] that enables informed decisions to be taken by the employees at the customer contact point. Matheus et.al(1993)[8] have described the challenges facing data mining in as, "The grand challenge of knowledge discovery in databases is to automatically process large quantities of raw data, identify the most significant and meaningful patterns, and present these as knowledge appropriate for achieving the users goals."

The most commonly used techniques in data mining[9] are:

- **Artificial neural networks:** Non-linear predictive models that learn through training and resemble biological neural networks in structure.
- **Decision trees:** Tree-shaped structures that represent sets of decisions. These decisions generate rules for the classification of a dataset. Specific decision tree methods include Classification and Regression Trees (CART) and Chi Square Automatic Interaction Detection (CHAID).
- **Genetic algorithms:** Optimization techniques that use process such as genetic combination, mutation, and natural selection in a design based on the concepts of evolution.
- **Nearest neighbour method:** A technique that classifies each record in a dataset based on a combination of the classes of the k record(s) most similar to it in a historical dataset (where k ^{3} 1). Sometimes called the k-nearest neighbor technique.
- **Rule induction:** The extraction of useful if-then rules from data based on statistical significance.

Many of these technologies have been in use for more than a decade in specialized analysis tools that work with relatively small volumes of data. These capabilities are now evolving to integrate directly with industry-standard data warehouse and OLAP platforms.

Technical Architecture of CRM Systems

The rapid growth and expansion of CRM systems can be described in three dimensions - business process, industry and technology. First, CRM systems have broadened support and automation of business operations, from call center operation, workflow management, e-procurement, to sales force automation (SFA). Second, CRM systems have been deployed in a wide variety of industries from financial CRM, marketing CRM, and pharmaceutical CRM to automotive CRM. Finally, the CRM technology has evolved from traditional CRM, online or Web based CRM, Hosted CRM, and Mobile CRM to Wireless CRM.

A CRM system consists of three major components:

- **CRM Software -** This is the backend of CRM systems which usually includes a relational database for storing persistent information, a software applications for handling business logics.
- **Client Hardware -** It could be a PC or handheld devices for accessing enterprise information.
- **Mobile Middleware** - A middleware facilitates the interactions between CRM software and access devices or PCs. The Mobile middleware provides great benefits for mobile workers to access and share enterprise information across organizational lines and locations.

CRM Applications

Some of the functional and technical requirements for CRM solutions are;

- **Business Intelligence and Analytical Capabilities:** CRM applications contain vast amounts of information that pertain to an organization's customers and prospects. This information needs to be leveraged and analyzed by decision makers so that they can make more informed and timely business decisions. This is possible only if CRM solutions have robust business intelligence and analytical capabilities. This is a major requirement primarily for marketing applications.
- **Unified Channels of Customer Interaction:** This involves not only integrating the functional components of CRM solution but also integrating these components across multiple channels so that the customer interaction can be seamless, consistent and efficient.
- **Web-based Functionality Support:** Web-based functionality is essential for applications such as web self-service and unassisted sales. Web is also a critical channel for e-business and is also important from an infrastructure perspective. Users of CRM applications require access to their applications, which is supported via standard web-browsers. Moreover business logic and data are maintained centrally, thus facilitating the deployment, maintenance, and upgrading of applications.
- **Centralized Repository for Customer Information:** CRM solutions should work from a centralized repository so that current customer information is available in real-time to all customer-facing employees.
- **Integrated Workflow:** CRM solutions should have a strong workflow engine

to ensure that cross-functional tasks can be accomplished as dynamically and seamlessly as possible.

- **Integrated with ERP applications:** Integration must include low-level data synchronization as well as business process integration so that the integrity of business rules can be maintained across systems and workflow tasks can pass between the systems. CRM-to-ERP integration also ensures that organizations can perform business intelligence across systems.
- The CRM applications are a convergence of functional components, advanced technologies and channels. Functional components include campaign applications, sales applications, marketing automation, and customer service and support applications. Channels include the Web, call centers and phone, and mobile devices. information);

Emerging impact of e–commerce on CRM:

In a fast changing Internet world there are very clear trends that are emerging:

- **Speed:** people expect service at internet speed.
- **Increase of globe market space:** More and more people, communities across the globe are able to build relationships.
- **Around the clock availability:** Internet offers round the clock availability of gods and services 24X7.
- **Expansion of partners:** Internet offers exponential ability for the organization and people alike to partner with suppliers and customers alike across the globe.
- **Disappearance of Time Zones:** The only time zone that is applicable is Internet time zone.

Similarly the new economy has opened up altogether different ways of conducting business as has never been witnesses ever since the industrial revolution. In a global market place the channels of marketing are already causing an impact on the buying behavior of individuals as well as organizations likes. Some of the emerging trends are:

- **Vertical E-market Place:** Industry specific market places such as being formed by Auto giants where organized buyers and sellers can meet, list, negotiate, order and track delivery.
- **Buy sites and sell sites:** Where consumers or organizations alike can buy and sell online through online shopping mart concept.
- **Horizontal market place:** Services that run across different vertical e-market places or business to customer (B2C) Buy and sell sites. Such sites could be delivery sites, insurance etc
- **Use of Internet to optimize** "Supply Chain Management": While earlier organizations use to feel EDI "rather an expensive preposition" for limited number of partners organizations, organizations are in a position to use internet to optimize their SCM across partners.

Recent Trends in CRM:

1) **Analytical CRM:-**Firms are now encouraging their analytical teams to work closer with their customers as it offers ample room for growth in profitability. They are endeavoring to see what sort of analysis actually matters to the customer through finding out what contributes to their highest satisfaction. The interest in this new functionality is easily one of the fastest growing trends in the industry.
2) **CRM - Mobile and Social networking:-**Another hot trend in the CRM industry is the "mobile" interest. CRM has currently gone mobile and is easily assessable almost anywhere. This new trend is fast gaining ground as the need for easy access is fundamental to any executive. Social networking sites are also being mined to garner the benefits of CRM.
3) **Outsourcing CRM:-**Outsourcing CRM is yet another new trend gaining ground. Sales force leads the pack in this area. Despite initial hesitation in this area, firms now realize that it is a good bet. The lure in this area is the lower costs involved, contributing to overall profitability.
4) **CRM and Cloud Computing:-**Cloud computing is a relatively new term referring to scalable, virtualized computing resources available on the Internet. There is now a growing demand for CRM cloud computing solutions and more vendors are jumping to satisfy this demand. Initially, it was a rent-versus-own argument. There are pros and cons to both approaches, but when it comes to rescuing small businesses from a recession-made dry spell, the cloud is almost always the rainmaker's choice — and the cheaper price tag is not the top reason. "An often-missed aspect of the cloud is that it provides more than just elastic infrastructure with a shared-cost model," said Miko Matsumura, vice president and chief strategist at Software AG. "Advances in social CRM and social BPM are leveraging the network in ways that impact the top line as well as the bottom line."

According to Salsburg, cloud computing has three key benefits for small to medium-size businesses:

- **Elasticity:** Resources can be provisioned and de-provisioned in real time to meet workload demands.
- **Utility:** Resource usage is provided on a pay-as-you-go basis, as opposed to the traditional approach of incurring the upfront capital expenses and ongoing operational expenses, even if the resources are under-utilized.
- **Ubiquity:** Services from the cloud are available from the Web, enabling user interfaces that go beyond traditional workstations and include cell phones and other appliances.

Net Promoter system

A Net Promoter system is a way of doing business. It requires every level of the organization be rigorously, consistently focused on the quality of customer and employee relationships first. The link between customer loyalty and true, sustainable, organic growth is well established, and provides companies with powerful, measurable

financial incentives to install a Net Promoter system. But unlike financial accounting rules that tempt companies to chase short-term profits at the expense of customer loyalty, a Net Promoter system requires—and inspires—an entire organization to do right by its customers and employees. It is the business equivalent of the Golden Rule: treat others as you yourself would want to be treated. A Net Promoter system requires that your organization and its senior management commit to:

1. sorting customers (and employees) into promoters, passives and detractors
2. creating short-cycle closed-loop feedback, learning, recovery and action processes
3. making it a top priority to earn the enthusiastic loyalty of customers (and employees)

Conclusion:

Today, information technology- conscious society has increasing appetite for the skills of others; as a result the service industries are growing. Marketers have now realized that in the global and highly competitive market place and market space, success rests on the firm's ability to attract, satisfy and retain its customers. This demands marketing efforts to be more informative, customer and service oriented. CRM is an innovative approach undertaken by the marketers in the process of developing lifetime customers and maximizing lifetime value of the customers. Companies no longer regard marketing, service and sales as separate entities. Instead they are more concerned with treating them with a holistic approach. From the above discussions it is clear that technology has been used effectively to enhance the utility and application of CRM. The need is to adapt ever changing technology to meet newer challenges before CRM. It is dynamic process and right mind-set of managers is key for the success.

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