CHAPTER-3
EMERGING TOOLS AND APPLICATIONS IN CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

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3.1 Introduction

In this age of cutthroat competition, Information is power. Every organization must make effective use of information to reduce costs and increase employee productivity— the bottom line is to increase profits. This objective cannot be achieved unless management gets right information at the right time.

If we look at the evolution of the information processing technologies/tools we can see that while the first generation of client/server systems brought data to the desktop, not all this data was easy to understand, unfortunately and as such, it was not very useful to end users. As a result a number of new tools have emerged that are focused on improving the information content of the data to empower the knowledge workers of today and tomorrow.

Among these tools are Data Warehousing, On-Line Analysis Process (OLAP) and Data Mining. These tools find applicability in a wide variety of business problems and solution development.

3.2 Tools for CRM development

Following are the emerging and most popular tools used in developing CRM applications

- Data Warehousing
- Data Mining
- Business Intelligence
- OLAP

3.2.1 Data Warehouse

A Data Warehouse (DW) is a relational database that is designed for query and analysis rather than for transaction processing. It usually contains historical data derived from transaction data, but it can include data from other sources. It separates analysis workload from transaction workload and enables an organization to consolidate data from several sources. In addition to a relational database, a data warehouse environment includes an Extraction, Transportation, Transformation, and Loading (ETL) solution, an Online Analytical Processing [OLAP] engine, client analysis tools, and other applications that manage the process of gathering data and
delivering it to business users.

In general Information Technology systems are divided into two categories: Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP).

OLTP is characterized by a large number of short on-line transactions. The main emphasis for OLTP systems is put on very fast query processing, maintaining data integrity in multi-access environments and an effectiveness measured by number of transactions per second. In OLTP database there is detailed and current data, and schema used to store transactional databases is the entity model.

OLAP is characterized by relatively low volume of transactions. Queries are often very complex and involve aggregations. For OLAP systems a response time is an effectiveness measure. OLAP applications are widely used by Data Mining techniques. In OLAP database there is aggregated, historical data, stored in multi-dimensional schemas.

Characteristics of a DW:

The characteristics of a DW (William Inmon) are as follows:

- Subject Oriented
- Integrated
- Nonvolatilie
- Time Variant

Subject Oriented:

DW’s are designed to help analyze data. For example, to learn more about your company's sales data, you can build a DW that concentrates on sales. Using this warehouse, you can answer questions like "Who was our best customer for this item last year?" This ability to define a data warehouse by subject matter, sales in this case makes the data warehouse subject oriented.

Integrated:

Integration is closely related to subject orientation. DW’s must put data from disparate sources into a consistent format. They must resolve such problems as naming conflicts and inconsistencies among units of measure. When they achieve this, they are said to be integrated.
Nonvolatile:

Nonvolatile means that, once entered into the warehouse, data should not change. This is logical because the purpose of a DW is to enable you to analyze what has occurred.

Time Variant:

In order to discover trends in business, analysts need large amounts of data. This is very much in contrast to Online Transaction Processing (OLTP) systems, where performance requirements demand that historical data be moved to an archive. A data warehouse's focus on change over time is what is meant by the term time variant.

DW Architecture:

The architecture of DW as shown in figure 3.0 below:

**Figure 3.1: Data Warehousing Architecture**

- Decision support
- Trend analysis
- Financial forecasting
- Churn Prediction for Telecom subscribers, Credit Card users etc.
- Insurance fraud analysis
• Call record analysis
• Logistics and Inventory management
• Agriculture

3.2.2 Data Mining (DM):

Overview

Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems. Data mining tools can answer business questions that traditionally were too-time consuming to resolve. They scour databases for hidden patterns, finding predictive information that experts may miss because it lies outside their expectations.

Data mining techniques can be implemented rapidly on existing software and hardware platforms to enhance the value of existing information resources, and can be integrated with new products and systems as they are brought on-line. When implemented on high performance client/server or parallel processing computers, data mining tools can analyze massive databases.

Evolution of Data Mining

• Data Collection (1960s): Technologies used were computers, tapes, disks and the characteristics are Retrospective, static data delivery.
• Data Access (1980s): Technologies used were Relational databases (RDBMS), Structured Query Language (SQL), ODBC and the characteristics are retrospective, dynamic data delivery at record level.
• Data Warehousing & Decision Support (1990s): Technologies used were On-line analytic processing (OLAP), multidimensional databases, data warehouses and the characteristics
are retrospective, dynamic data delivery at multiple levels.

- **Data Mining (Emerging Today):** Technologies used are advanced algorithms, multiprocessor computers, massive databases and the characteristics are Prospective, proactive information delivery

The most commonly used techniques in data mining 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 processes such as genetic combination, mutation, and natural selection in a design based on the concepts of evolution.

**Nearest neighbor method:** A technique that classifies each record in a dataset based on a combination of the classes of the record(s) most similar to it in a historical dataset.

**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.

**Data Mining Task:**

There are various data mining tasks available as follows:

**Classification:** Classification refers to assigning cases into categories based on an attribute. The task requires finding a model that describes class attribute as a function of input attribute. To train a classification model, you need to know the class value of input cases in the training dataset, which are usually the historical data. Typical classification algorithm includes decision trees, neural network, and Naïve Bayes.

**Clustering and segmentation:** This task is used to segment a database into subsets, or clusters based on set of attributes. It is a method to group data into classes with identical characteristics in which the similarity of intra-class is maximized or minimized. Clustering is unsupervised data
mining task, no single attribute is used to guide the training process. All input attribute are treated equally.

**Association:** This technique identifies affinities/associations among the collection of data as reflected in the examined records. A result is patterns describing rules of association in data. Most association type algorithms find frequent itemsets by scanning the dataset multiple times. The frequency threshold is defined by the user before processing the model branch is a classification question and leaves of the tree are partitions of data set with their classification. It divides data on each branch point without losing any of the data. The number of churners and non churners is conserved as we move up or down the tree. ID 3, C4.5, CART and CHAID are some algorithms used in this technique.

**Regression:** The regression task is similar to classification. The main difference is that the predictable attribute is a continuous number. Linear regression and logistic regression are the most popular regression methods. Other methods are regression tree and neural network.

**Neural Networks:** True neural networks are biological systems that detect patterns, make predictions and learn. The artificial neural networks are computer programs implementing sophisticated pattern detection and machine learning algorithms on a computer to build predictive models for historical databases.

**Forecasting:** Forecasting usually takes as an input time series dataset. This technique deals with general trends, periodicity, and noisy noise filtering. The most popular time series technique is Auto Regressive Integrated Moving Average Model (ARIMA).

**Sequence analysis:** Sequence analysis is used to find pattern in discrete series. A sequence is composed of series of discrete values. E.g. Web Click sequence contains a series of URLs. Sequence and Association data are similar in the sense that each individual case contains set of items. The difference between sequence and association model is that sequence model analyze the state transitions, while the association model considers each item in a shopping cart to be equal and independent.

**Deviation Analysis:** Deviation Analysis is for finding those rare cases that behave very differently from others. It is also called outlier detection. Deviation analysis can be used in credit card fraud detection.

Data mining embraces a range of techniques such as neural networks, statistics, rule induction, data visualization etc. examining data within current computer systems with a view to
identifying potential business advantages by uncovering useful, previously unknown information. Today computers are pervasive in all areas of business activities. This enables the recording of all business transactions making it possible not only to deal with record keeping and information for management but also, via the analysis of those transactions, to improve business performance. This has led to the development of the area of Computing known as Data Mining (Adriaans and Zantinge 1996).

Majority of organizations record and store large amounts of data in a variety of databases and often there is restricted access to that data. In order to glean information, a user would ask a specific range of questions. However, the question itself may not actually be known. Data mining can provide methods to identify the questions to be asked in order to gain a greater understanding of the data and analytical processes (Meltzer 2004). By applying the techniques identified above, companies have utilized their data relating to tasks such as identifying customers’ purchasing behavior, financial trends, anticipate aspects of demand, reduce and detect fraud etc. Data mining encompasses a range of techniques each designed to interpret data to provide additional information to assist in its understanding which can assist in the areas of decision support, prediction, resource handling, forecasting and estimation.

**The Modeling Cycle**

The data mining modeling cycle involves a number of stages. Initially, it is important to have a clear understanding of the business domain in order to understand the operational analytical processes (Thomsen 1998), the problems that are to be surmounted, and the opportunities that may be realized and to assess the availability of data. Exploring and preparing the data, although time consuming (Sherman 2005), is a crucial stage in the cycle. New fields may be derived from one or more existing fields, missing and boundary values identified and processed relationships between fields and records identified form some of the pre-processing tasks that assist in cleaning the data prior to the mining process. Once data has been prepared for mining, the modeling stage can begin.

Choosing and developing models involve domain knowledge (Brachman & Anand 1996, Chen et.al. 2004), the results of which are validated against known or expected results and either deployed or refined.
**Business Understanding**

This phase of the cycle emerges from a commercial business environment such as marketing, customer retention etc. However the concepts can be utilized in policing as it focuses on understanding criminals and criminality, understanding the aims of reduction and detection of crime and being able to use the above knowledge to concentrate on achieving defined objectives.

Within a data mining modeling environment understanding the core business and understand the underlying data: -

- What information is required to be known?
- What variables can be used to transform the data into information?
- What are the variables, which are used only in special instances of the data?
- Can combining or deriving other variables enhance the significance of certain variables?

**Data Collection**

To reach the goal, it may require supplemental data to be captured separately by manual processes and subsequently stored in electronic format.

**Data Processing**

Data preparation is the most important feature of the CRISP-DM process and also the most time consuming (Sherman 2005). This step identifies the generic issues relating to preparing Satara and Pune Police crime data for this and all subsequent data mining analysis. The consistency of the data and its subsequent encoding is directly proportional to the results of the mining process (Lawrence 1991, Weiss & Indurkya 1998). It is not uncommon for data sets to have fields that contain unknown or incorrectly and missing values.

There are five basic processes for treating records that contain missing values: -

1. Omit the incorrect field(s)
2. Omit the entire record that contains the incorrect field(s)
3. Automatically enter/correct the data with default values
4. Derive a model to enter/correct the data
5. Tag the value as incorrect

During this stage in the cycle a variety of encoding techniques may be utilized to provide additional fields for analysis and enable fuzzy concepts. There are a number of fields within the
CCIS databases that do not contain data and are stored in the database as “NULL” or as an empty string. Within the studies in this thesis, data could be a number on a continuous scale (such as age), binary (such as gender), nominal (such as hair color), and ordinal (such as hair length). Valuable information can be lost in transforming from one form to another (Gordon 1981).

Model Building

Modelling algorithms assist in the extraction of complex interrelationships prediction, estimation and classification thereby providing ‘expert’ decision support.

Validation

The resultant model may be validated in terms of its clarity, parsimony, generality and testability (Mayhew 1984) to assess the degree to which it meets the required objectives. A number of techniques may be used, for example: -

1. N-fold cross validation (Bischoff 1995).
2. Use a domain specialist to examine the results (Montgomery 1998, Chen et al 2004).
3. Cluster evaluation (Halkidi et al 2001)
4. Statistical analysis

Commercial Data Mining Products

There are a number of commercially available software packages for data mining and, depending upon its implementation, each offers a combination of relevant features.

SPSS Clementine

This package utilizes a visual approach to data mining with an emphasis on a person with domain knowledge performing the analysis. It combines learning algorithms and statistical techniques with the facilities to manipulate, display and visualize the data.

SAS Enterprise Miner

The SAS Enterprise Miner is an integrated suite of software with a graphical user interface which provides a front end for ease of use. The SAS mining process is referred to as
SEMMA.

The data may be extracted from a variety of sources and stored in a ‘local’ database to improve the performance of analytical procedures. Using the in-built data visualization capabilities the user is able to reduce the number of measures to those that are more likely to have a predictive impact. The Enterprise Miner’s strength lies in its analytical engine for the modeling phase which includes a comprehensive range of integrated models and algorithms including decision trees, neural networks, clustering and a variety of statistical techniques.

**IBM Intelligent Miner**

Intelligent Miner software (IBM 2002) includes association rules, classification and time series clustering which operates on the DB2 relational database. The client side is accessed via a graphical user interface (GUI) and the results of any mining operation can be imported into a variety of software products. IBM DB2 Intelligent Miner for Data provides a single framework for data mining. It has a suite of tools that support the iterative process, offering data processing, statistical analysis and visualization techniques complimenting a variety of mining methods. The Intelligent Miner can access data from DB2, flat files and a variety of sources via their proprietary Data Joiner.

**3.2.3 Business Intelligence (BI)**

Business Intelligence (BI) is technology infrastructure for gaining maximum information from available data for the purpose of improving business processes. Typical BI infrastructure components are as follows: software solution for gathering, cleansing, integrating, analyzing and sharing data. Business Intelligence produces analysis and provides believable information to help making effective and high quality business decisions.

The most common kinds of Business Intelligence systems are:

- EIS - Executive Information Systems
- DSS - Decision Support Systems
- MIS - Management Information Systems
- GIS - Geographic Information Systems
- OLAP - Online Analytical Processing and multidimensional analysis
• CRM - Customer Relationship Management

BI systems based on DW technology. A DW gathers information from a wide range of company's operational systems, BI systems based on it. Data loaded to DW is usually good integrated and cleaned that allows producing credible information.

3.2.4 OLAP

OLAP is the abbreviation for **Online Analytical Processing**, a category of software tools that provides analysis of data stored in a database. OLAP tools enable users to analyze different dimensions of multidimensional data. For example, it provides time series and trend analysis views. OLAP often is used in data mining.

The chief component of OLAP is the OLAP server, which sits between a client and a database management system (DBMS). The OLAP server understands how data is organized in the database and has special functions for analyzing the data. There are OLAP servers available for nearly all the major database systems.

A relational database and an OLAP database both contain information about your business. A relational database can be used for many different purposes. It is generally optimized so that you can quickly insert and update records. An OLAP database is generally used to analyze data. It is optimized so that you can quickly retrieve data. An OLAP database is generally created from the information you have put in a relational database.

**Cubes**

An OLAP database is a collection of cubes. A cube is a structure that stores your business data in a multi-dimensional format that makes it easy to analyze. Designed to be departmental, and optimized for performance, a multi-dimensional OLAP cube consists of aggregated, summarized, and pre-calculated data. Usually each cube contains data that focuses on a specific aspect of the business, such as sales data, financial data, or data for tracking inventory. Each cube is usually designed to address a specific business question. When you create a report, you connect to a cube, and use the data from that cube in your report.


**Dimensions**

A cube contains dimensions and measures. A dimension is a component of a cube; it groups related business data, such as product lines, or sales regions, or time. Dimensions become the axis dimension labels for the columns and rows of your reports. Dimensions have levels. A level is a component of a dimension; it specifies the amount of detail for the data. Each level above the lowest level contains the aggregated data from the level below. The lowest level contains the most detailed data; the highest level contains the most summarized data.

**Members**

Dimensions also have members. For example, the dimension USA could contain California, and Los Angeles. A member is a subset of a dimension, and the cube equivalent of a value in a relational column. Members are organized within a dimension by levels, for example Country, State/Province, and City. Members at the lowest level are aggregated to members at higher levels. For example, the value of California is an aggregate of Los Angeles, San Francisco, and so on.

A geography dimension might have these levels and members:

<table>
<thead>
<tr>
<th>Levels</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regions</td>
<td>Asia, Europe, North America, South America</td>
</tr>
<tr>
<td>Countries</td>
<td>Brazil, Canada, China, France, Germany, India, USA</td>
</tr>
<tr>
<td>Cities</td>
<td>Beijing, Berlin, Ottawa, San Francisco, São Paulo</td>
</tr>
</tbody>
</table>

Each of the members, except those at the lowest level, can have children. Children are the members on the next level below that are aggregated to obtain the value for a specific member. In the table above, the children of Europe are all the countries in Europe. The children of Canada are all the provinces in Canada. The children of Yunnan are all the cities in Yunnan Province.

All the levels of a dimension are referred to as a hierarchy. A hierarchy can be either balanced, ragged, or unbalanced. In a balanced hierarchy all the members at the lowest level are on the same level. In a ragged hierarchy the members at the lowest level are on different levels. In an unbalanced hierarchy, each branch of the hierarchy can have a different depth. This differs from a ragged hierarchy, which just has missing members for a level, as shown below.
Dimensions can optionally have more than one hierarchy of levels and members per dimension. This is the case, for example, for SQL Server Analysis Services.

**Measures**

There is also a special dimension called measures. Measures are the numbers on which you make your comparisons. It includes members such as: cost, profit, or taxes.

**Aggregated Data**

Aggregated data is usually, although not always, the sum of the data from the lower levels.

OLAP reports all contain a row axis, a column axis, and a filter axis. The dimensions on the row axis appear on the rows in the report. The dimensions on the column axis appear on the columns in the report. Dimensions can be nested on either the rows or the columns.

The filter axis does not appear on the report, but the dimensions on the filter axis can affect the contents of the report. By definition, all dimensions that are not on the row axis or the column axis are on the filter axis.

### 3.3 CRM APPLICATIONS

CRM applications integrate business sales, marketing & customer support functions. CRM applications constitute a powerful suite of high-end tools that help to effectively streamline business sales, marketing and customer relationship functions. Using just one user-friendly solution one can securely store data, automate key business functions, coordinate sales and marketing, improve employee performance, cut costs, and focus on maximizing customer satisfaction.

By safely maintaining customer database, CRM software applications help you to effortlessly manage customer issues. Individual preferences can be clearly recorded to enable one-to-one services. This helps to maximize customer satisfaction and loyalty, which in turn helps to improve customer retention.

CRM Software Applications may be categorized as On-premise, Web-hosted and Enterprise CRM on the basis of the size of the user organization and where the application is installed and how it is delivered to the user.
3.3.1 On-premise CRM:

On-premise CRM applications are generally meant for large businesses looking for in-house CRM solutions that run on organizations' secure network. These CRM applications can be purchased with just one-time payment from any leading vendor based on the specific facilities required. However, on-premise CRM applications require extensive deployment, separate hardware, custom software plus maintenance.

3.3.2 Hosted CRM:

Hosted CRM software applications are generally meant for small and medium-sized businesses that cannot afford the high-costs of purchasing on-premise solutions. A hosted CRM application runs in the provider's secure server and is delivered via the Internet without the investment in expensive hardware, software or maintenance. The user can access and use these solutions with different features for the entire business CRM needs for a monthly fee.

3.3.3 Enterprise CRM:

Enterprise CRM applications maximize business interactions and improve customer relationships. CRM enterprise applications come equipped with a host of interactive tools to help manage and control business tasks from remote locations. They are easy-to-use, user-friendly with interface facilities and streamline communication between key business functional areas. Sales and marketing processes can be managed, work allocation and performance monitoring is possible, project campaigns can be drafted and meaningful feedbacks can be obtained.

Using CRM applications organisations can easily study market trends and also identify potential market in a timely manner all of which are vital and increase business ROI.

3.3.4 Emerging CRM Application Software

Following are the top fourteen application software, which are popular worldwide. Each application software, which caters to the diverse CRM needs of organizations regardless of their size has been briefly described here.

1) Aplicor - Aplicor
2) Infor CRM - Infor
3) Maximizer CRM - Maximizer Software
4) Microsoft Dynamics CRM - Microsoft
5) NetSuite CRM - NetSuite
6) Oracle CRM On Demand - Oracle
7) Pivotal CRM - CDC Software
8) SageCRM.com - Sage Software
9) SAP CRM - SAP
10) Siebel - Oracle
11) SugarCRM Suite - SugarCRM
12) InfusionSoft - Infusion Software
13) SalesNexus
14) InTouch

3.3.4.1 Aplicor

‘Aplicor’ software solution is a hosted, integrated, wireless and Web-based CRM software suite which includes Sales Force Automation, Marketing Automation, Project Office and Customer Support. The entire CRM suite can be deployed quickly and it is easy to use. Aplicor CRM helps organizations acquire, retain and grow profitable customer relationships by improving marketing effectiveness, increasing sales win rates, growing customer share, decreasing customer churn, automating sales and customer support activities and providing a holistic real-time view of the customer relationship across the organization.

Aplicor is suitable for mid-market organizations as well as divisions or departments of larger organizations who prefer a pay-as-you-go subscription purchase that includes all IT and support staffing instead of the high-dollar capital outlay for a software license and the additional funds required for implementation consulting services and the hiring of additional IT or support resources.

The Aplicor has a Business Intelligence (BI) information analysis suite which includes data warehousing, Online Analytical Processing (OLAP) and predictive reporting. The Aplicor application software is designed from the ground up to use the Internet for online, real-time
delivery. It is entirely customizable based on individual or group preferences that are typical of mid-sized organizations. The application suite provides sophisticated CRM functionality that is comparable with applications in large organizations with the IT resources and financial means.

3.3.4.2 Infor CRM

‘Infor CRM’ is a Customer Relationship Management (CRM) application for customer contact management. It helps in maintaining contact with every day customers whether on the web, by phone, or via mail. It enables organizations to target the right offer to the right customer at the right time. It combines marketing, sales, and service to create a 360º view of the customers. Infor CRM is suitable for companies in financial services, communications, retail, hospitality, travel and leisure, and manufacturing.

It is a solution with an advanced decision engine to help organizations to react quickly, intelligently, and personally to every customer interaction and convert them into sales and predict customers' future preferences based on their real-time activity and past responses.

It provides for the right tools to plan, execute, and monitor outbound marketing campaigns across every customer contact. Aids in the conduct of multichannel marketing campaigns that build ongoing customer relationships and respect customer preferences, helps win new and keep current customers while selling more to each one.

Provides all the data needed to turn any interaction into a sale. Helps in up-selling, generating leads, improving customer service and simplifying the ordering process. Also provides valuable insight into customers' spending history and current activity.

3.3.4.3 Maximizer CRM

‘Maximizer CRM’ is an on-premise application, which enables to centralize customer information across sales, marketing and customer service, improving efficiency and productivity thus focusing on the most important part of the business that is the customers. The database resides in-house therefore gives more control of the data and confidence that it is secure and easily accessible.
The solutions provided by Maximizer are:

a) **Contact Management**: enables the organization to manage all customer and prospect communications and interactions from one centralized hub. This includes lead management, sales opportunity management, scheduling, reporting, and document management. Contact management provides a strong foundation for the business to build on and allows getting up and running quickly with minimal resources.

b) **Mobile software**: this solution, including Mobile Access for smartphones and tablets (including iPhone, Google Android, Windows Mobile and iPad), and MaxMobile CRM for BlackBerry, organisations can go beyond reading and reacting to email - and be proactive about managing their customers and winning more deals. Laptop or Internet connection is not always available when one needs to look-up the latest status of an account’s last service call, review the latest proposal, or check notes for the last phone call with a prospect. Thus enabling to keep track of all your customer relationships in real-time.

### 3.3.4.4 Microsoft Dynamics CRM

Microsoft Dynamics CRM is a multi-lingual Customer Relationship Management software package developed by Microsoft. It is offered out of the box, the product focuses mainly on Sales, Marketing, and Service (help desk) sectors. Dynamics CRM is a server-client application, which is primarily a web application, which also supports extensive web services interfaces. Organisations can access Dynamics CRM either by using Microsoft Internet Explorer web browser or by a thick client plug-in to Microsoft Outlook.

Microsoft Dynamics CRM provides the following solutions:

a) **Sales Force Automation**: This solution optimizes sales efforts with the familiar and intelligent features. Includes a highly intuitive interface and embedded Microsoft Office capabilities to increase time with customers, shorten sales cycles, increase close rates, and achieve real-time insight. It improves sales planning and management, helps in setting up territories and teams for optimal organizational efficiency. It automates lead system, manages opportunities effectively, streamlines account management, boosts sales productivity, enhances pipeline management and simplifies workflow processes.
b) **Customer Service:** Microsoft Dynamics CRM is developed to meet the changing expectations of customers with a service solution that is flexible. This intelligent solution informs customer service professionals with guidance that is insightful and actionable. It enables the service organization to manage accounts with insight and collaboration. Enhance customer service with insightful, actionable intelligence. It enables quick response to cases, simplifies contract management, gets the right information at the right time. It can be integrated with mobile telephony.

c) **Marketing:** The application facilitates effective data management, pinpoints the marketing efforts, streamlines campaign planning, simplifies campaign execution. In addition it helps improve response management and streamlines lead tracking.

d) **Extended CRM:** these are extensions to the CRM application, which help manage relationship with employees, partners, suppliers, distributors, vendors, and many other critical stakeholders.

### 3.3.4.5 NetSuite CRM

‘NetSuite CRM+’ software provides powerful customer relationship management (CRM) capabilities, including sales force automation (SFA), marketing automation, customer support and service, and flexible customization, all in a web-based CRM solution. It provides for automation in sales performance, order management and marketing effectiveness capabilities.

NetSuite CRM+ is a CRM solution that is completely integrated with the back office. It includes Order management, fulfillment and financials. It eliminates manual entry and risk of error thus accelerating processes. All these processes can be seamlessly integrated thereby ensuring that the business operates on the same customer and transactional data. This application enables the user to have a real-time visibility into the customer lifecycle that is from lead to close to fulfillment.

With NetSuite, organisations can easily manage the entire customer lifecycle from suspect to quote, order, service, and repurchase from anywhere at any time.

The NetSuite+ provides the following solutions:
a) **Sales Force Automation:** This solution provides for order book management and tools required to drive sales performance with sales forecasting, commission management and up-sell management.

b) **Customer Support and Service:** This software provides for online customer support and service. It helps in lowering the customer care cost. In addition, it can easily be accessed anytime, anywhere thus making it suitable for remote call centers and workers.

c) **Marketing Automation:** It enables automation of targeting, building and execution of marketing campaigns. It also helps measure the success of marketing campaigns.

d) **Mobile / Wireless:** Drives sales and service from anywhere with mobile access thus ensuring that the business users get real-time access to the business information they need, when and where they need it.

e) **CRM Analytics and Reporting:** provides for dashboards that provide fingertip access into sales, marketing and customer service performance. It also helps to integrate back-office metrics for total business visibility.

f) **Partner Relationship Management:** As an extended CRM this suite enables the user to collaborate with its partners through a complete partner relationship management (PRM) capabilities thus organizations can treat their channel partners as an extension of the direct sales team, with joint marketing campaigns, lead management and order processing.

3.3.4.6 Oracle On Demand CRM

As the global leader in CRM, Oracle's Complete CRM solutions offer the broadest and deepest capabilities that help organizations drive Sales, Marketing, Service, Call Centre, Analytics and Mobile capabilities.

a) **Sales:** Oracle CRM On Demand Sales increases sales productivity and results by providing companies with a comprehensive set of tools to optimize the entire sales processes. From initial lead qualification to opportunity management through forecasting and deal closure. CRM On Demand Sales also delivers critical information to everyone involved in the sales process, including inside sales, field sales, sales management, and partners. Embedded real-time reporting and powerful historical analytics provide insight to help make better decisions. By automating sales processes, and providing a comprehensive view of the customers, CRM On
Demand Sales helps sales teams focus on selling rather than searching for information, resulting in increased productivity and higher revenues.

b) **Marketing:** Oracle CRM On Demand Marketing provides organizations with a smart, simple, integrated solution for managing marketing campaigns and activities. Oracle CRM On Demand Marketing provides a full suite of capabilities to automate the complete marketing process, from designing inbound and outbound campaigns through lead management and lead nurturing to measuring marketing ROI. With built-in e-mail and Web marketing, easy-to-use automation, and built-in analytics, Oracle CRM On Demand Marketing provides the best of enterprise marketing automation.

c) **Service:** Oracle's CRM On Demand Service solution enables organizations to provide quick, accurate, and consistent service to their customers, driving both increased customer satisfaction and organizational profitability. CRM On Demand Service brings together all of the critical elements of a comprehensive service management solution that are needed to handle simple questions or manage a complex issue. With CRM On Demand Service, agents have clear visibility into the information that is required to ensure customer issues are resolved to satisfaction.

d) **Call Centre (Contact Management):** Oracle Contact On Demand is the only hosted multichannel support application that can be deployed in days. Teams can work efficiently from anywhere in the world with 360-degree views into customer interactions and real-time business intelligence. Users can gain from rapid and personalized sales and service, while organizations can dramatically reduce costs and increase revenues.

e) **Analytics:** Oracle CRM On Demand’s fully interactive analytic capabilities lets organizations gain deep insight into your business by combining real-time and historical pre-built and ad hoc reports as well as customizable dashboards. Oracle CRM On Demand is the only CRM solution that delivers actionable insight at the speed of business.

f) **Mobile:** Oracle Mobile Sales Assistant and Oracle Mobile Sales Forecast offer a rich user experience that connects sales users with the people and information they need to be more productive and efficient. With the help of handheld devices that allow to keep in touch with the latest information at any time of the day. This is a solution provided to the sales representatives who are on the move.
3.3.4.7 Pivotal CRM -CDC Software

The ‘Pivotal CRM’ application software helps deliver customer service and streamline service request process. It quickly creates service tickets from Outlook email or social media. This application is based on the fact that organizations the foundations of customer relationship management strategy are the customer-facing employees. Therefore, it can be closely-tailored to match exactly how the team works. It provides the tools to help attract customers, manage partners and empower sales and customer service teams.

Following solutions are also provided in this application:

a) **Sales:** For salespeople it provides them the tools to eliminate down-time and help them convert prospects to sales. The sales force automation solutions are built to enable mobile communication, integration with marketing and customer service and support salespersons managing their day.

b) **Marketing:** This application has features that help achieve marketing goals. It gives powerful, time-saving and a user experience that matches the way one works. This means delighting the sales team with a user friendly solution that easily demonstrates measurable returns.

c) **Service:** The customer service and support solution is designed to provide the tools one needs today and the flexibility to create own processes as one goes on using it. It enables the user to capture, manage, and resolve customer service and support requests quickly, while never losing sight of up-selling and cross-selling opportunities.

d) **IT Services:** The solution provider understands that every department wants something different from the CRM system. Some need mobility, others an intuitive workflow for entering customer data. Everyone wants it to work the way they work. Therefore this application provides sales and service solution that is user friendly, which can deploy full sales, marketing and service suite quickly. Because of the platform flexibility one have the tools to create custom workflows and interfaces that perfectly fit the requirement.

3.3.4.8 SageCRM

‘SageCRM’ from Sage software is a web-based CRM solution that is easy to use and
quick to deploy. Many organisations use Sage CRM to help their sales, marketing, and customer service teams build more profitable relationships every day. It offers front-to-back-office integration across CRM and ERP. SageCRM.com is hosted by Sage making it the ideal solution for small and medium business organizations seeking a low-cost CRM solution.

**Features and capabilities:**

- **Easy to use.** User teams can easily personalize their workspace and quickly navigate their way around the system due to the innate usability of Sage CRM and SageCRM.com.
- **Quick to Deploy.** It can be setup and run in a matter of days with one of the Sage-certified business partners globally. It delivers rapid return on investment or the organizations have the option to go on-demand to get started immediately.
- **Easy to Customize.** Out-of-the-box workflow can be customized to reflect the business processes. The open architecture enables seamless integration with third party applications, speeding up deployment time and reducing the total cost of ownership.
- **Integrates with your Business.** This solution can be integrated with Sage ERP products to deliver end-to-end business integration out-of-the-box. This gives sales, marketing, customer services and other front-office staff a true 360 degree view of customers across front-and back-office functions.

### 3.3.4.9 SAP CRM

The ‘SAP CRM’ from SAP that has helped best-run companies in more than 26 industries to achieve excellence in all aspects of customer relationship management. It has provided this application that helps organizations to focus on their most valuable assets – their customers. Whether it's sales, service, or marketing it enables organizations to retain their best customers and maximize the effectiveness of every customer interaction.

Some of the SAP CRM capabilities are as follows:

a) **Marketing:** With SAP CRM, marketers gain the essential business insights needed to make intelligent decisions, sharpen their focus on customers to drive demand and increase customer retention, and better manage marketing resources. Marketing capabilities include:

- Marketing resource and brand management
- Campaign management
• Segmentation and list management
• Real-time offer management
• Loyalty management
• E-marketing

b) **Sales:** With SAP CRM, organizations can transform their direct and indirect sales force into a team of knowledgeable and trusted advisors – fostering efficient collaboration between sales, marketing, and service teams to align efforts on fulfilling customer needs. The sales capabilities include:
• Sales
• Sales on demand
• E-commerce
• Interaction center
• Partner channel management

c) **Service:** With SAP CRM, one can reduce service costs while enhancing customer satisfaction by streamlining service operations and delivering exceptional customer service. Service capabilities include:
• Service
• Interaction center
• Business communication management
• Real-time offer management
• Partner channel management
• E-service

d) **Contact Centre:** With SAP CRM, organisations can maximize customer loyalty, reduce costs, and boost revenue by transforming contact center into a strategic delivery channel for marketing, sales, and service efforts across all contact channels. Features and functions that enable contact center capabilities include:
• Interaction center
• Business communications management
• Marketing
• Sales
• Service
Real-time offer management

3.3.4.10 Siebel- Oracle

‘siebel’ now part of Oracle Corporation is world's most complete customer relationship management (CRM) solution, Oracle's Siebel CRM helps organizations differentiate their businesses to achieve maximum top-and bottom-line growth. It delivers a combination of transactional, analytical, and engagement features to manage all customer-facing operations. With solutions tailored to more than 20 industries, Siebel CRM delivers comprehensive on-premise and on-demand CRM solutions, tailored industry solutions and role-based customer intelligence and pre-built integration.

Some of the Siebel capabilities are as follows:

a) **Sales:** Oracle's Siebel Sales applications maximize sales effectiveness in real time by accelerating the quote-to-cash process, aligning sales channels, increasing pipeline and win rates, and raising average transaction values. It provides comprehensive, industry-specific sales force automation capabilities, proven mobility solutions for disconnected access and On-demand CRM options for fast roll-out.

b) **Marketing and Loyalty:** Oracle's Siebel Enterprise Marketing Suite is a comprehensive closed-loop solution that empowers B2B and B2C organizations across industries to achieve excellence in marketing. Tailored to the needs of business and consumer marketers across more than 20 industries, the Siebel Enterprise Marketing Suite delivers actionable insight to all members of the marketing organization.

c) **Contact Centre:** Oracle's Siebel Contact Center and Service product family helps businesses deliver efficient customer service. Whether a company needs hosted, mobile, or on-premise solutions, these applications provide optimal resource deployment, speedy issue resolution, one-and-done request handling, and powerful tracking and analytics capabilities. As a result, businesses can increase customer satisfaction while cutting costs at all touch points around the globe.

d) **Knowledge Management:** Oracle's InQuira knowledge management products offer simple and convenient ways for users to access knowledge that is hidden in the myriad systems, applications, and databases used to store enterprise content. It helps users of their websites find
answers amid a growing mountain of online information. This solution is an enterprise knowledge management (EKM) designed to index large amounts of information with the goal of making that content searchable. Oracle's products for knowledge management help users find useful knowledge contained in corporate information stores.

In addition Siebel offers Industry-specific options

3.3.4.11 Sugar CRM

SugarCRM is a easy to use business CRM, designed to help business organizations to communicate with prospects, share sales information, close deals and keep customers happy. It helps manage sales, marketing and support. As an open-source, web-based CRM solution, Sugar is easy to customize and adapt to the changing needs. Ideal for small and medium-sized companies, large enterprises and government organizations, Sugar can run in the Cloud or on-site.

Some of the Sugar CRM capabilities are as follows:

a) **Sales:** Sugar CRM drives sales force performance by allowing sales representative to track and share contacts and opportunities, manage and up-sell into existing accounts, forecast revenue, monitor performance through dashboards, manage quotes and contracts, work offline through sugar mobile and collaborate through integration with Microsoft Outlook, Lotus Notes and other groupware applications.

b) **Marketing:** Sugar closes the loop between marketing and sales. Creates, executes and tracks campaigns across multiple channels with a built in campaign wizard. It allows to develop compelling email marketing programs and capture leads directly into the CRM system with web-to-lead forms. It helps manage and assign leads to the sales representatives and track the return-on-investment on marketing programs.

c) **Customer Support:** With Sugar customer support, acquiring new customers and up-selling to existing ones becomes inexpensive. Customer cases can be handled quickly and effectively. Sugar customer support centralizes customer service requests across channels to allow companies to manage inbound emails, share knowledge and resolve customer issues.

3.3.4.12 Infusionsoft
‘Infusionsoft’ is a CRM application designed for growing small businesses, which combines CRM, e-mail marketing and e-commerce into one integrated system driven by the power of marketing automation. Whether organisations sell online, manage a sales team or anything in between, Infusionsoft can help convert leads, grow sales and save time.

Capabilities of Infusionsoft are as given below:

a) **Convert Leads:** Infusionsoft provides for smart lead nurturing by combining email marketing with the CRM system, it allows creation of personalized messages that are sent just at the right time, which builds better relationships. Thus when the leads are ready to buy, they'll turn to the organisation.

b) **Sales Growth:** With Infusionsoft, organisations can easily identify hot leads that are ready to engage and add everyone else to nurturing campaigns so they don't slip away. Plus, the user can increase repeat business through personalized up-selling and consistent, long-term communications that keeps the company/brand name top-of-mind the next time they’re ready to buy.

c) **Time Saving:** Infusionsoft's marketing automation engine helps save time by automatically keeping all of the systems synchronized, eliminating mundane tasks and automating many of the sales and marketing processes. Thus everything happens behind the scenes, enabling the marketing team to focus on more important aspects of the business.

3.3.4.13 SalesNexus

‘SalesNexus is basically a Sales CRM built for sales people. It creates sales automation by managing intelligence and creating automated processes that save time and close sales. It provides for capturing new leads, automating the responses and measuring successful deals.

It provides for the following capabilities:

a) **Unlimited Email Marketing:** SalesNexus provides unlimited emails through a fully featured email marketing, which includes tracking of opens and clicks, automated auto-responder campaigns, insightful analytics and the ability to easily manage lists and create emails.

b) **Secure Information and Contact Sharing:** Allows for secure sharing of contact
information, notes, documents, reminders and ongoing step-by-step processes all accessible by any user, anywhere in the world. SalesNexus allows the user to take action rather than waste time searching for information.

c) **Easily Customizable CRM:** The application allows for customizing the CRM database and create personalized fields, screens, processes and campaigns without restrictions.

d) **Task, Call and Appointment Management:** The online CRM software keeps task lists and calendars for every user and reminds the user when it’s time for that important follow up.

e) **Measure and Manage:** The software generates call reports and enables sales pipeline management. Thus reporting who’s doing what, thereby enabling to reward and coach team members and make decisions.

f) **Communicate Professionally:** SalesNexus web based CRM software creates templates one can use for an individual contact at a time or for an entire list at once. The SalesNexus library allows the sales team to access reference documents, articles, reports, videos, any file they need, in one place, anytime and send it to customers with one click.

3.3.4.14 InTouch

InTouch CRM helps you maintain records of each and every customer interaction from the lead stage till their repeat sales. Importantly, the application helps you retrieve information regarding the client, conduct targeted marketing activities, and monitor each and every activity through smart reports.

Following solutions are also provided in this application:

a) **Contact Management:** Each customer in the system is stored as a contact. Beginning with the basic feature of viewing a contact and all their details, there are more functions such as adding a new contact, Batch updating of contacts, and even Import of contacts from other data forms such as an Outlook Data file, or even a generic Microsoft Excel or Access Database. The contact module allows for treating the customer as an isolated individual, or as a member of a larger organization or a group depending on the campaign requirement.

b) **Workflows:** Managing customers has its own set of workflows, InTouch CRM provides tools to manage those workflows. Some of the workflow tools are as follows:

  - Calendar: For each user, to keep a tab of his own activities for himself, and also
collaborate with his team members by sharing a public calendar with his appointments on it.

- **Taskpads:** It is a things-to-do list which is a very simple yet powerful tool to help manage time and tasks around a busy schedule, without missing a single item.
- **Contact History:** this feature helps you see all the client interactions of a particular contact at a single glance.
- **Documents:** The system ensures that the entire sales and marketing team uses the same set of collaterals such as brochures, application forms, and any other such printed material or forms required from time to time.
- **Customer Service:** This feature groups together all the functions needed by a customer service team that helps them keep track of customer requests, or grievances and promptly address them.

c) **Sales Module:** The sales module helps an organization to consolidate all campaigns and existing customer loyalty to real revenue. It has functions that take care of a lead across the entire sales cycle. Within the sales module there is a provision to keep a tab on various products that are available for sale, along with the available inventory for each product.

d) **Marketing:** InTouch provides e-mail and SMS campaigning ability. It also allows the user to create survey forms and gather first hand feedback from your customers.

e) **Reports:** Intouch CRM helps the user to generate reports such as sales funnel, cost per lead trends, and many such information that directly concerns the management. Apart from the standard reports, InTouch CRM gives an option of creating customized report formats, based on which repetitive reports can be drawn.

**Conclusion:**

In conclusion it is stated that technological development has made available tools and applications to develop new customer relationships, serve the existing customer profitably and most important integrate organizational systems to satisfy the customer. Data mining, data warehousing, OLAP and business intelligence are some of the popular tools discussed in this chapter that help in discovering a hidden pattern in customer data. The use of these tools in CRM application development enables the user in finding the general customer behavior, trends and preferences. The emerging CRM applications discussed in this chapter are the most popular that are available in the market. These application software developed by the best IT companies in
the world provide for technology-enabled CRM to the user. The capabilities of these applications enable the user to firstly interact with the customer on a one-to-one basis and secondly to collect customer information that is vital to delivery of service.
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