CRM: From 'art to science'

Received (in revised form): 15th September, 2005

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Abstract Early research and methods concerning customer relationship work often focus on more intuitive approaches to customer management. Many of the initial theories, such as one to one marketing and value-based management, were less analytical in their approach. Likewise, too often companies that have implemented customer relationship management (CRM) systems have done so with an unstructured approach (art) as opposed to a structured and by-the-numbers approach (science). This paper focuses on developing a decision support system (DSS) that allows for better measurement and management of a CRM system.

This paper identifies the core components of a CRM/DSS that generate improvements to decision making in all stages (acquisition, development and retention) of customer relationships. Unlike previous research and discussions on this topic by academics and industry practitioners alike, a cross-functional approach that incorporates different disciplines and departments — such as finance, marketing, risk, operations, market research and technology — is adopted here. An application of a CRM/DSS is then applied to financial services as a case example.

INTRODUCTION

Decision support systems (DSS) have been around for over 35 years.¹ They gained popularity and greater adoption with technical advances and improved economics in computing technology during the late 1970s to 1990s. Many varieties of DSS were related to systems such as expert systems multidimensional analysis, query and reporting tools, online analytical processing (OLAP), business intelligence and executive information systems (EIS). Much of the evolution of DSS was not integrated across departments and focused more on operational and company performance metrics. Hence many DSS evolved toward a silo, aggregate level type of

financial and performance data. This approach would diverge from the theoretical approach to developing a customer-centric approach to management.

Customer relationship management (CRM) has been in existence for a long time, however, it did not come into its name and officially gain momentum — especially in terms of its name — until the 1990s.² CRM is a business strategy evolved to manage the development of a company, the acquisition and retention of its customers and to create long-term value between them.³ CRM has spurred the development of the new business-to-consumer (B2C), business-to-business markets (B2B) and

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business approaches to database marketing and personalisation through a multi-channel environment. Although it does not have the longer history of DSS, it does have a higher acceptance rate in terms of notoriety among and adoption by academics and practitioners alike. CRM, like DSS, however, has seen fragmented adoption within companies which has had led to stovepipe growth within organisations. For instance, many vendors have developed systems called CRM systems, but which are technologies that focus primarily on selected company operations such as sales force automation (SFA) and call centre support.

INTEGRATING CRM AND DSS

Identifying the lessons learned from both CRM and DSS implementation can help identify the weaknesses and strengths of both systems. As discussed, the 'silo' adoption and implementation of both CRM and DSS has been a major shortcoming of both systems. This has not allowed either system to reap its maximum benefits, and various studies have emphasised the shortcomings of return on investment.⁴ Both systems, however, have broad adoption and wide coverage by industry and functional areas within a company. For example, both systems are used by a vast array of industries. Also, although CRM and DSS have often been focused within particular areas of a company, they can both cover the entire organisation, from operations to marketing, finance, service, human resources and technology. Organisationally, these systems and the associated technology have been adopted from back office departments within IT (data marts for DSS and data warehouses for CRM) to the executive offices (EIS for DSS and executive dashboards for CRM).⁵

Both DSS and CRM utilise a wide array of data and technology. CRM is primarily a customer-focused strategy whereas DSS can be thought of as the infrastructure that can measure, capture and deliver performance. Together CRM and DSS can generate a knowledge environment that maximises *customer value* and measures, monitors and provide *intelligence* to company and customer performance profitability.

BENEFITS TO CUSTOMERS AND COMPANIES

CRM/DSS are systems that integrate varied data and apply quantitative techniques that define the most attractive message, the optimum marketing mix of product features, the right price points, the best delivery channels and appropriate level of service assigned to each customer.

The system accounts for each customer's propensity for specific products and services, based on their unique perception of what constitutes value along a continuum of product features, service capabilities and price points. It also factors in the strength of the company's image and its influence on the buying decision. It allows companies to identify, monitor and change their value propositions to reap maximal benefits to their stakeholders (customers and shareholders).

Greater yields are realised from each customer by organising the business and managing their resources around customers' needs, preferences and price sensitivities. CRM/DSS employ a technology infrastructure that would predict changes in market share and the expected profitability. Market share will fluctuate in response to changes in product and delivery characteristics under different pricing strategies for customers with distinctly different preferences and

price sensitivities. For each proposed marketing programme, the influence from each competitor's counter reaction is used to develop effective product and marketing strategies that will exceed customers' expectations for value. These strategies can be directly linked to financial performance and shareholder valuations. Investment in new products, marketing, new delivery channels and branch re-engineering can be scrutinised and evaluated for their potential for success, given the anticipated economic and competitive environment scenarios.

CRM/DSS accurately measure the market demand for the company's products and provide control over the market by simulating the changes in demand that occur by changing product, pricing and service characteristics. These models are based on sophisticated discrete choice technologies and other non-linear mathematical techniques that accurately represent how customers will respond when given a choice among different competing products and services. These models categorise customers by their similar choice behaviours, attitudes and transaction activities. Customers' likely responses and subsequent predictive behaviour patterns can then be correlated with profitability levels and expected duration. These models are frequently calibrated with new customer, competitive and economic data so that the changes occurring in the marketplace can be accurately interpreted and their effect on the customer determined. Through 'test and learn' scientific methods, these models can be modified for continuous improvement (pareto improvement). This helps managers to make better decisions over product development, marketing and pricing strategies so that they can maximise profitability and penetration into each potential market segment. For each specific product, accurate profitability and

market share models define how value is perceived by each customer segment, relative to competing products in that market. By developing a modelling framework for measuring customers' perceptions about value, customer profiles that define the customer's choice attributes and purchase criteria for each product in each customer segment have been formulated. These also weigh the importance each customer places on the individual quality and price factors that count in their purchase decision.

By simulating the product choice behaviour within individual customer segments and by changing the specific product attributes and pricing structures, reliable forecasts of market share and profitability are generated. Strategic planning is greatly enhanced and attractive products can be targeted at those customer segments with the greatest potential for long term profitability. An unlimited number of scenarios can be developed to accommodate anticipated changes in the business environment, including changes in economic factors, customer preferences and competitor's strategies. Individual customer strategies can be developed to maximise the expected net present value (NPV) of cash flows and be integrated with corporate marketing strategies to enhance target marketing, customer acquisition and relationship management functions.

These analysis tools can be used to increase the profitability of each channel and achieve competitive advantages by optimally configuring each branch or store for specific opportunities within its local market through the development of superior product, service and pricing strategies.

Some of the capabilities of a CRM/DSS system include:

- Evaluating profitability and market

- share for products within each line of business.
- Forecasting the impact on the market marketing campaigns and product changes.
- Estimating market demand, individual customer revenue, cost, margin contribution and profitability at the product and service level.
- Using sophisticated forecasting algorithms and powerful 'what if' analysis capabilities to identify revenue opportunities in competitive markets.
- Developing optimal resource allocation methods for minimum cost and maximum revenue.
- Evaluating how different customer segments perceive value.
- Continuously monitoring and measuring the value of products relative to that of the competition.
- Evaluating customer service preferences and determine analytically their value (eg life time value [LTV], NPV in determining optimal customer servicing levels across multiple touchpoints.

Sophisticated mathematical models are integrated into a comprehensive CRM/DSS for developing forecasts and creating relationship management strategies. For example:

- Market share models that are sensitive to the factors that influence a consumer's choice behaviour.
- Resource optimisation models that determine profitable service and distribution strategies.
- Profitability models that analyse profit impacts from specific marketing strategies and product changes.
- Market size models that forecast total demand for each product within each customer segment as well as the target market potential.
- Target marketing models for

determining the best prospects for each different product based on customer events and preferences.

- Pricing models that define specific pricing strategies for profitability and market share based on evaluations of competitive pricing and customers own-cross price elasticity (substitutes and compliments).

These models are developed using a variety of techniques and data sources. Some examples include publicly available government and industry trade data sources, market research data and a variety of proprietary forecasting techniques with over ten years of proven effectiveness in production environments.

DSS help firms develop an edge over the competition by taking advantage of the dynamics and changes within the market through a greater understanding of:

- competitors' strategies and how they impact market demand;
- the competition's ability to respond given its revenue and cost structures;
- the components of market demand and what influences its size;
- the nature of the buying decisions for each product within each behavioural segment; and
- the profitable actions that can be taken with each customer.

A FINANCIAL SERVICES CASE

Retail banking has been faced with the issue of how to market to customers and non-customers while at the same time minimising risk exposure. Marketing management and risk management are at odds in applying the basic tenets of their theories in the pursuit and management of the customer markets. Marketing develops value propositions and target markets the population based upon who

is more likely to respond, whereas risk management develops risk criteria and sets risk offers based upon who is more likely to default. In isolation, both marketing and risk management would develop a myopic DSS environment in 'managing customers by the numbers'. Companies without a strategy, coordination and clear objectives for customer profitability and performance will develop suboptimal decision criteria that can lead simultaneously to lower customer value and lower company profits.

This section of the paper will develop a CRM/DSS environment that integrates multiple disciplines of risk, marketing and technology to maximise management and measurement for financial companies using both CRM and DSS. Companies such as Wells Fargo, E*Trade and Deutsche Bank are considered industry leaders for taking a very quantitative systems-oriented approach to their adoption of CRM. Their performance and customer numbers help bear out the value of their approaches, using, in part, a customer insight technology such as the 'customer dashboard'. With first in industry rankings for retail banking cross-selling and cross-channel customer experience, Wells Fargo has achieved remarkable growth with an aggressive approach to new channel development, innovative product strategy and sales. Its 2003 annual report said: 'Eighty percent of our growth comes from selling more products to existing customers.'⁶

Joining risk and marketing

All too often, marketing programmes that are developed using a risk-dominated approach to marketing can prelude certain population groups among the target market based solely on risk performance. Likewise, if marketing programmes are devoid of risk

parameters, than too many consumers associated with higher risks could be targeted. To address this target market dilemma faced by many financial services, a balanced or 'risk-weighted' marketing approach is employed, whereby both marketing and risk parameters are incorporated throughout all stages of CRM in order to maximise profitability and customer value. Potential customers who might otherwise be eliminated solely on risk criteria would be eligible to receive marketing offers and the expected default or charge-off rate would be applied to the marketing programme portfolio along with the customer portfolio. Thus risk is managed at both the individual- and portfolio-based levels. Expectation of risk tolerances and expected market response, acceptance, approval, cross-sell ratio, retention and reacquisition are all factors that are applicable to a risk-weighted approach to marketing.

CRM/DSS environment for financial services

Adaptive and unbiased decisions and trend analyses can be conducted in a sequential time series approach to dynamic monitoring of the risk/reward ratio in a portfolio. Extensive use of data warehouse-based DSS techniques is the key to achieving this functionality. The modelling process is both interactive and iterative and is conducted at each of the key phases of portfolio management. Hence:

- Decisions are made on an objective and uniform bases throughout the portfolio;
- The decisioning criteria can be 'adaptive' as new time series of relevant factors are folded in during iterative updating of the model;
- With a data warehousing system in

place, these models can uncover hitherto 'hidden' customer segments that can be anomalously loss-inducing or profitable;

- Relative weightings for resource-related costs can be assigned, for multiple products, on an optimal risk/reward ratio basis for effective 'relationship' maintenance;
- Customer growth management and retention criteria can be effectively implemented using adaptive risk scores;
- Marketing opportunities can be enhanced through cross-selling using risk-optimal profitability;
- Customer servicing can be enhanced by analytics that incorporate attitudes, preferences and willingness to pay (ie 'listening to the customer') relative to customer value.

To build a CRM/DSS environment companies must adapt a CRM framework which addresses all stages (acquisition, development and retention) and which consists of the core components — processes, data, modelling/analyses and technologies. These key core components are outlined in subsequent sections of the paper.

Key CRM processes

As with any plan, a mis-step can occur in implementation if the processes are not linked well or, more importantly, are not aligned with the strategic objectives and goals of the initial strategy. Poor links between the process and strategy are often cited as CRM pitfalls at this step.⁷ Core processes for financial institutions can be further categorised within the CRM stages as:

- 1 Develop customer acquisition strategy — identify criteria to determine the greatest likelihood of responding for

customers with high profitability and acceptable risk profiles.

- 2 Develop customer qualification strategy — develop approval decision and determine optimal risk base pricing for multiple products.
- 3 Develop customer conversion strategy — identify the optimal product attributes to overcome consumer-initiated rejection of offer.
- 4 Develop customer activation strategy — determine the criteria of acceptance; utilisation needs or first mover effect.
- 5 Optimise balance building strategy — enhance product attributes such as line size, interest rate and other core features best aligned with customer risk profiles for maximum portfolio profitability to generate value benefits for the customer and profitability for the financial institution.
- 6 Redefine product development strategy — develop new products and redefine existing products to provide optimal match with customer value perceptions.
- 7 Optimise retention strategy — minimise defection of profitable customers.
- 8 Optimise reacquisition strategy — create inducement and value propositions to recapture profitable customers.

Key data and information categories

In any viable system, data are the key building blocks: modelling and analysis are critically dependent upon data.

Internal data — sometimes called 'household data' — are core differentiators in the analytical CRM process. *Ceteris paribus*, the internal data is the one differentiation and competitive advantage available to a company concerning its customers.

Internal data will need to be

supplemented with data from external sources for business, commercial and consumer targets. External sources allow one to determine some of the market potential assessment as well as geo-demographic, lifestyle and economic information on a customer basis. This data will then be merged to form a dataset on a customer and household level that will be used in the next phase of the project, the benchmarking process, where assessment of current behaviour and targeting for future marketing will occur. This allows penetration of segments where opportunities exist for developing new profitable relationships or increasing the value of existing relationships by extending a company's share of customers' wallets (creating switching behaviour).

In order to identify the company's market in terms of existing customers' preferences and prospects, market research is typically conducted. This allows the information obtained from the profiling models to be supplemented with customer and non-customer preference data to obtain a full picture of customer behaviour, preference and potential profitability. This information will then be used to help design buyer value propositions that can be structured and validated with marketing campaigns.

By combining market research and benchmarking models of marketing and risk behaviour, quantitative assessment of preference behaviour and market share can be developed. Using the outputs results and information data from the models and research one can construct measures and simulations to decide how various product features, services and marketing mix factors affect customer and non-customer behaviour. Furthermore, the tradeoffs between these features and their effect on customer behaviour and company profitability can be measured. This optimisation process

will result in designing buyer value propositions — that will be part of the campaigns — to be tested and ultimately validated. The various internal, external, market research and other sources of data that would be recommended for a CRM/DSS for financial services are outlined below.

- Demographics/firmographics/geodemographics: examples would include Standard Industrial Classification (SIC) or North American Industry Classification System (NAICS) code, zip code, years in current occupation, income, assets, contact information, channel usage and preference.
- Credit history: examples would include — Fair Isaac Corporation (FICO) and bureau scores (ie calculated risk parameters), debt/income ratios, judgments, liens and inquiries.
- Deposit history: examples would include balance in various financial products, fraud indicators, number and type of overdrafts.
- Financial: examples would include credit and deposit history (borrowing capacity, leverage potential, repayment sources) and debt/income ratios (types of income, net worth, loan types, deposits, interest rate, fees by type, NPV).
- Vintage history: examples would include delinquency status, charge-offs, utilisation rates over time, renewal and line increases.
- Performance score modelling: examples would include utilisation history, current and past product mixes, repayment history, bureau derogatories, profitability metrics.
- Triggered events: examples would include expiration of promotion offers, birth dates, anniversary dates, college, change of marital status, change of address, income change.

- Campaign marketing: examples would include package codes, number of times contacted, time of response, channel of entry, offer amount, rate, fees.
- External (eg FICO, Claritas, Donnelley, Polk): examples would include credit attributes, lifestyle factors, psychographic, geodemographics, purchase intent, economic, business products/services.
- Customer servicing patterns and levels: examples would include channel preferences, product and service trade-off preferences, service usage, channel touchpoints preferences and satisfaction.
- Market research: examples would include customer preferences, analytics derived from conjoint primary research customer and non-customer data, prior purchased data, pricing preferences, customer satisfaction ratings.
- measure and monitor *ex ante* and *ex post* preferences, behaviour and processes;
- support recurring customer value-based analysis;
- provide consistent customer information back to the operational environment; and
- design an environment for scalability and flexibility to meet other business needs.

Some key types of analytics that are necessary components of a CRM/DSS approach are examined in the following sections.

Profiling models

Profile, or look-alike, models identify and differentiate customers who purchase product(s)/service(s). Both models measure extremes in the decile analysis and can identify those customers who will not purchase and, among those who do purchase, those that are unprofitable. Some of the types of models that are used by financial institutions are:

- Likelihood of purchase models — determine the likelihood of whether a customer purchasing a product/service.
- Product propensity models — determine how much of a product or service a customer will use.

Balance building models

These models determine the usage mix of the various products and services held by customers. This class of models measures the percentage mix of product types by customer and includes:

- integrate customer information from various sources (eg internal, external);
- design 'test and learn' approaches;
- Profitability product-mix clustering models — determine the current and potential customer relationship

Analytics

Included in the process will be the quantification of the branch network, centralised service functions and customer management processes to determine their effectiveness in (1) delivering superior value within each local market; and (2) attracting and sustaining profitable segments of the market and determining that the cost of service is properly aligned with the profitability captured from each customer. As part of any scientific method that captures customer and market behaviour, a 'test and learn' approach should be developed to plan, measure, monitor and modify CRM programmes. The CRM/DSS analytics framework is designed to:

- integrate customer information from various sources (eg internal, external);
- design 'test and learn' approaches;

- presence among a financial services company's customers by measuring the depth and length of this relationship. It determines usage of clusters of products — eg assets, deposits, credit (loan/line) — per customer segment in order to determine product usage patterns.
- Customer temporal cross-sell models — provide a time sequence of how customers purchase products/services over time. These models determine what clusters of products and services customers appear to migrate to in their relationship with the financial institution; hence these models can be structured around a customer relationship view.
 - Develop utilisation/balance building models — measure the behaviour derived from the percentage utilisation of product types by customers. They determine usage of clusters of products — eg asset, deposits, credit (loan/line) — per customer segment in order to determine current utilisation rates dimensionalised across products and services.

General observations on quantitative risk modelling

Often the input data utilised are derived from the financial institution's own marketing, risk and transactional databases in a time series form. This allows for customised modelling reflecting the characteristics of the financial institution-specific customer base. Customer information based on demographics and prospect information for new acquisitions/campaigns is often derived using industry/local standards or 'like-behaving' populations in specific user segments. Where bank-specific data are lacking, some of these data sources can be substituted for some of the modelling requirements outlined below.

Note that there may be times when a specific modelling task cannot be simulated mathematically due to a sparsity of data and the indeterminate effects of the dataset utilised.

- Build risk-based pricing models using the originations score — with an acceptable origination score, the performance/behaviour scores and profitability metrics typically can be monitored over 12–18 months for each account booked. Once the charge-off population is identified, a composite 'risk score' can be constructed using a linearly weighted combination of applicants' financials, FICO scores, risk parameters and other relevant demographic variables for the surviving population. A correlative analysis of this risk score with respect to the corresponding behaviour scores can yield a ladderised pricing scheme. The pricing strategy evolved in this approach will be risk-optimised for the expected loss on a portfolio basis. These risk-based pricing models can add value by:
 - assigning each new account a price for the risk profile of its appropriate segment;
 - automatically accounting for economic and business cycle effects in pricing, as time-correlated performance scores are a determining factor;
 - optimising the portfolio profitability by correcting pricing imbalances in marginal or non-performing accounts. This re-adjustment may play a critical role in retention/attrition schemes.
- Develop performance/behaviour scoring models — these models establish a dynamic metric based on customer behaviour related to default potential. Repayment and delinquency patterns observed over

Table 1: CRM/DSS requirements in the customer acquisition stage

CRM process	DSS analytics	DSS data requirements
<p><i>Customer acquisition.</i> Develop selection criteria that will elicit responses from customers with high profitability and acceptable risk profiles</p>	<ul style="list-style-type: none"> • Profitability behaviour • Customer profiling <ul style="list-style-type: none"> – product share – bundling – market share/conjoint • Customer segmentation • Market testing 	<ul style="list-style-type: none"> • <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information; product attributes; other bank account data; historical performance data; FICO scores • <i>External:</i> demographic attributes; economic census information; geodemographic and lifestyle factors; credit bureau attributes
<p><i>Customer qualification.</i> Make approval decision and determine optimal risk base pricing for multiple products</p>	<ul style="list-style-type: none"> • Origination modelling <ul style="list-style-type: none"> – Demographic patterns – Purchase patterns – Financials – Market research • Risk-based pricing 	<ul style="list-style-type: none"> • <i>Internal:</i> see above • <i>External:</i> see above • <i>Other:</i> FICO scores; financial data; credit and deposit history; borrowing capacity; leverage potential; secondary repayment sources; leverages; debt-servicing; debt/income ratios; discretionary income; net worth; liquidity factors; outstanding loans; loan types; product attributes
<p><i>Customer conversion.</i> Develop right product attributes to overcome consumer-initiated rejection of offer</p>	<ul style="list-style-type: none"> • Booking rate analysis <ul style="list-style-type: none"> – timing – bundling – product shares – market share/conjoint 	<ul style="list-style-type: none"> • <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information on product attributes; financial data • <i>External:</i> demographic attributes; economic census information; geodemographic and lifestyle factors; channel preference; points of entry

CRM, customer relationship management; DSS, decision support systems; FICO, Fair Isaac Corporation.

the previous 12–18 months, in conjunction with the in-period charge-off/non-accrual rates, can predict the probability of a customer defaulting. These scores can be evaluated at the account level or the obligor level in the portfolio. Estimating the likelihood that a current obligor will go 'bad' has potential uses in:

- early warning through automatic computation of risk;
- improving process efficiencies through adaptive asset quality rating based on this score;
- pro-active triage and forecasting of losses through charge-offs;
- Risk-based pricing mechanisms based on expected loss rates and current payment patterns;
- servicing of low-risk customers;

- balance building and retention management strategies optimised for the changing patterns of performance scores on a periodic basis;
- new customer acquisition programmes incorporating behaviour characteristics and profitability potential given economic conditions.

Loyalty models

This series of models measure, the likelihood of the numbers of purchasers of products and services being ended. These loyalty-based models directly determine the duration or length of relationships with various customers.

— Attrition models — provide the

Table 2: CRM/DSS requirements at the development stage

CRM process	DSS analytics	DSS data requirements
<i>Customer activation.</i> Develop right product attributes to overcome acceptance criteria	<ul style="list-style-type: none"> Discrete choice & conjoint modeling <ul style="list-style-type: none"> – first mover effects – purchase patterns – market research 	<ul style="list-style-type: none"> <i>Internal:</i> data as used in customer acquisition stage <i>External:</i> data as used in customer acquisition stage <i>Other:</i> FICO scores; financial data—credit and deposit history; borrowing capacity; leverage potential; secondary repayment sources; leverages; debt-servicing; usage rates <i>Transactional:</i> purchase patterns and destinations; channel usage product attributes
<i>Balance Building</i> Enhance product attributes such as line size, interest rate and other core features best aligned with customer risk profiles for maximum portfolio profitability	<ul style="list-style-type: none"> Adaptive optimisation modelling for <ul style="list-style-type: none"> – credit line management – loss forecasting – profitability-based – segmentation Delinquent/overlimit collection strategies Market testing for <ul style="list-style-type: none"> – first-mover effects – triggered marketing 	<ul style="list-style-type: none"> <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information on product attributes; financial data <i>External:</i> augment with other lending relationships, lifestyle factors, NPV profile/optimisation model; customer need to migrate to other customer products <i>Other:</i> account level risk attributes continually tested, challenged and updated
<i>Product development.</i> Develop new products and redefine existing products to provide optimal match with customer value perceptions	<ul style="list-style-type: none"> Adaptive optimisation modelling for: <ul style="list-style-type: none"> – credit line management – loss forecasting – profitability-based – segmentation Delinquent/overlimit collection strategies Market testing for: <ul style="list-style-type: none"> – first-mover effects – triggered marketing 	<ul style="list-style-type: none"> <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information on product attributes; financial data <i>External:</i> other lending relationships; lifestyle factors; NPV profile/optimisation model; data on migration to other customer products <i>Other:</i> account level risk; marketing attributes continually tested via campaign; service level results

CRM, customer relationship management; DSS, decision support systems; FICO;

metrics for determining retention rates of customers.

The integration of the CRM processes, DSS analytics and DSS data requirements for individual CRM stages — customer acquisition, customer development and customer retention — are listed in Tables 1–3 respectively.

Organisational readiness

The process changes needed to create a CRM/DSS environment can be daunting. Upon making the decision to move forward into a CRM/DSS

environment, a key challenge that faces a company is where to begin. Different companies vary in the outcomes they want to achieve as well as in their current state of readiness, as is demonstrated in the Wells Fargo and E*Trade case studies. Starting with an end state in mind (eg a strategic plan) and then choosing the area with the highest potential marketing NPV in terms of implementation and execution, readiness is to be advised, however. As discussed later, neither Wells Fargo nor E*Trade tried to build a CRM/DSS environment all at once. Instead, both companies adapted CRM/DSS in a way

Table 3: CRM/DSS requirements at the customer retention stage

CRM process	DSS analytics	DSS data requirements
<i>Customer retention.</i> Minimise defection of profitable customers	<ul style="list-style-type: none"> • Weighted preference model for competitive offers • Survival analysis • Root cause analysis • Switching models <ul style="list-style-type: none"> – bundling behaviour – purchase patterns – market research – market testing 	<ul style="list-style-type: none"> • <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information on product attributes; financial data • <i>External:</i> data (other lending relationships, lifestyle factors), customer need to migrate to other customer products
<i>Customer reacquisition.</i> Create inducement to recapture profitable customers	<ul style="list-style-type: none"> • Time–purchase patterns • Market research • Loyalty models 	<ul style="list-style-type: none"> • <i>Internal:</i> profitability data; transactional behaviours; purchase history patterns; product groupings; account information on product attributes; financial data; root cause information • <i>External:</i> (lifestyle factors), customer need to migrate to other customer products

CRM, customer relationship management; DSS, decision support systems.

that allowed early successes and chose product(s) and service(s) areas that were more CRM and DSS 'change process ready' both in terms of physical and human resources as well as organisational change readiness. Some of the biggest obstacles facing companies in moving to a CRM/DSS environment are the necessary organisational process changes. Lack of experience, uncertainty, human and financial performance can slow adoption and even lead to the abandonment of a CRM/DSS approach. Early successes can be the catalyst to overcoming some of the organisational issues facing CRM/DSS. Additionally, the outcomes from initial CRM/DSS implementation can become benchmarks for future enhancements and modifications needed to integrate this approach with other areas of a company's organisation.

TECHNOLOGY INFRASTRUCTURE

The CRM/DSS essentially entails a centralised storage/update facility for supporting the decision models that address marketing management, risk management and operational

management. The importance of having a data warehouse and applying decision support cannot be over-emphasised: it is impossible to fine tune operations to deliver superior value profitably to a large population of customers with varying needs and preferences without them. This is why so many companies today lose money on the vast majority of their customers. The CRM/DSS environment can help a financial institution build better information management and analytical systems that significantly enhance its competitive advantage through the delivery of offerings that are designed to satisfy the priority needs of those customers that represent the greatest potential for profitability.

Using data warehouses allows data research and analysis, information marketing and consistent, subject area coordination of data with high integrity when information is needed to solve a specific business question. The architecture of the warehouse can show the end-user what to look for and where to find the required data. A diagrammatic representation of the CRM/DSS infrastructure is given in Figure 1.

Figure 1: Customer relationship management (CRM) decision support system (DSS) technical architecture OLAP, on-line analytical processing.

COST-BENEFIT RESULTS

Companies employing a CRM/DSS approach have realised significant benefits. The following two case studies are useful in illustrating lessons learned and results obtained by companies that have integrated CRM/DSS at different stages of development.

Case one: Wells Fargo Bank

In the early 1990s, prior to its merger with Norwest Financial, Wells Fargo Bank was known in the financial services industry as a super-regional bank. It was considered a leader in employing DSS in areas of risk management and fraud detection; however, it lacked advanced marketing

DSS capabilities. The growing small business banking area was tasked with finding 'how to grow a small business without a bricks-and-mortar national presence'.

In the mid-1990s, Wells Fargo embarked on a CRM/DSS approach to growing its small business banking by leveraging its data warehouse and data marts on existing customers and non-customers. It targeted both customers and non-customers in its key territories based upon its brand recognition. The strategy was to start with one or two products (ie business loans/lines) and measure the performance of the programme before scaling up the CRM/DSS approach. The 'test and learn' approach derived from earlier

campaigns allowed its marketing and combined risk methods to calibrate risk-weighted models to target non-customers in non-brand-recognized locations as the bank moved further from its bricks-and-mortar base in the USA. Multi-channel touchpoints were used along with extending CRM/DSS to other product groups in the small business environment. DSS were used to measure and increase customer development (eg cross-selling and up-selling) and, eventually, to retain customers to yield maximal profits and benefits over the bank's previous non-DSS approach.

The results were astonishing and made Wells Fargo Bank the No. 1 Small Business Banking Lender in the USA.⁸ The NPV per account ranged from \$417 to as high as \$1,800, depending upon multi-channel acquisition. CRM/DSS was instrumental in growing sales to over \$1bn in outstandings for in- and out-of-state business in less than seven months. Wells Fargo developed several new product offerings based on the outcomes of its CRM/DSS approach. Eventually, Wells Fargo Bank — which is considered a pioneer and a leader — leveraged the success of CRM/DSS to other areas of the bank and extended its reach outside the USA. The success of its CRM/DSS approach continues today. Wells Fargo enjoys the No. 1 industry ranking for retail banking cross-selling and cross-channel customer experience and the highest cross-sell ratio among banks internationally.⁹

Case two: E*Trade

One of the most recognised early dot.com companies during the 1990s was E*Trade. As part of the dot.com boom, E*Trade enjoyed a large growth because of its value proposition of attracting do-it-yourself or self-directed investors,

which was an alternative to traditional investment institutions such as Merrill Lynch and other very large investment firms. Many other dot.com companies soon mimicked E*Trade's value proposition. Faced with the highly competitive self-directed investor dot.com companies, E*Trade was challenged with 'how to grow its customer base and create a solution that allowed it to grow without compromising servicing its existing customers'.

E*Trade had leading brand recognition due to its innovative ads; however, it lacked a structured and integrated marketing strategy and framework to engineer continuous growth of profitable customers. E*Trade lacked a DSS capability to apply a CRM structure to its customers. In 1999, E*Trade began building a CRM/DSS approach from the ground up. First, it looked at its internal systems of data, process, capital (physical and human) and organisation to develop its CRM strategy. It looked at enhancing, analysing and changing its resources and organisational structure. Initial work involved analysing, surveying and segmenting its customers and the universe of investors in order to develop initial value propositions to attract, grow and retain customers that would maximise its profits. The advanced segmentation factored the preferences, attitudes, behaviour and tastes of existing customers and non-customers whose preferences mirrored E*Trade's various core competitors. E*Trade started small by developing initial risk-weighted modelling for marketing programmes targeted at customers and non-customers. Based on the 'test and learn' experience, it was able to continuously modify and re-segment the universe of investors to create more effective offers. Eventually, multiple products/services were developed and the prior learning was

extended to multiple touchpoints. An end-to-end approach allowed initial prospects to be scored and their behaviour to be monitored at near real-time as they interacted with the web and other touchpoints. Thus appropriate servicing levels were applied throughout the customer lifecycle (ie from prospect to customer) by tracking customer interactions with the various touchpoints. At various stages, appropriate offers were generated, tracked and measured at the customer transaction level as prospects/customers researched, inquired, purchased and obtained servicing. In addition, E*Trade could measure the impact of its decisions to see how they effected outcomes in the market (customers and competitors).

E*Trade developed new products and services based upon feedback on customer preferences and willingness to pay feedback. E*Trade built a full CRM/DSS environment consisting of CRM, information technology, data warehousing, multi-channel strategies, marketing programmes, marketing communications, data warehousing, web marketing, database marketing, data mining, campaign management, personalisation, servicing, organisational change, performance metrics and reporting. The results were nothing short of spectacular, yielding a NPV per customer ranging from \$390 to \$740. Predictive modelling improved direct mail response rates by 250 per cent with 30 per cent savings on expenditure.

The resulting CRM/DSS environment segmented customers' needs, wants and preferences, delivered personalisation to existing customers and strong web marketing value propositions to new customers that together resulted in generating over \$15 million in revenues per quarter. It achieved a growth in customers' assets of 121 per cent over the previous year and increased earnings

per share of 250 per cent for E*Trade.¹⁰ E*Trade's success continues today with the continuous development and enhancement of the CRM/DSS system it built in 2000. E*Trade's CEO attributed the company's strongest year in 2004 to the success of its CRM/DSS-based customer segmentation and increasing integration.¹¹

Key lessons

Both Wells Fargo and E*Trade realised significant improvements upon implementing a CRM/DSS environment. Some key lessons learned by both Wells Fargo Bank and E*Trade were:

- Think big and start small — have a clear CRM strategic plan of desired outcome and targets. Start small in both the adoption of CRM and DSS; for example, pick a small number of products or services and small sections of the organisation so that early wins can be realised.
- Success leads to easier adoption — organisational and process changes are typically the biggest challenge to getting all areas of a company's organisation on board with a CRM/DSS environment. Early wins allow other parts of the organisation to listen, learn and move forward with implementing CRM/DSS in their own areas.
- Be ready for change — develop a structured process plan but be flexible in its implementation so as to accommodate any unexpected obstacles with resources, requirements and external factors.
- Use scientific methods — employ science to ensure that measurement and targets are optimised (eg use 'test and learn' approaches) and factor key actors (eg customers, competitors,

- shareholders) into decision making.
- Build institutional memory — planing, capturing, measurement, implementation and change should be documented and tracked throughout the CRM/DSS environment conversion process. This helps companies to have benchmarks (eg balanced scorecards) to better capture past and current resources and metrics of CRM/DSS environments and to improve them in the future.
- Continuously improve — just as hardware suffers obsolescence, so too can systems. Companies should continuously improve their infrastructure and systems, including CRM and DSS. For example, the segmentation strategy that works today needs continuous upgrading and enhancements to be effective tomorrow.

CONCLUSION

CRM and DSS evolved from years of research and development in consumer behaviour, resource optimisation and marketing science. Separately they have not achieved the expected results touted by many vendors of these technologies. Together, however, CRM and DSS have realised increased benefits. CRM/DSS allows an organisation to evaluate the impact that changes in product attributes, prices and customer preferences will have on market share, profitability and shareholder value. Therefore, market reactions and financial consequences from product development and pricing strategies can be anticipated prior to their deployment.

Typically, marketing, risk and service functions operate independently. Each business decision made by a department has a 'ripple effect' on other parts of the company, which influences customers' perceptions and company profitability. By

approaching marketing and operations from an overall profitability perspective, decisions are no longer made in isolation. An integrated DSS enables firms to make decisions based solely on the impact on customers' perceptions and profitability. This level of effectiveness is achieved by using sophisticated mathematical models to evaluate the impact of various decisions and by integrating the systems and data used to make those decisions. Therefore the various departments will become more unified and jointly involved in the decision-making processes that affect the customer, which will undoubtedly improve competitive position in the marketplace.

Having CRM/DSS significantly enhances the firm's competitive advantage. This will allow a company's resources to maximise market demand by developing products and delivery options that are strategically priced for growing market share within those customer segments that represent the greatest long-term value. Individual company results with CRM/DSS will vary given the various stages of adoption and absorption rates of the CRM/DSS environment. Nonetheless, as markets employ CRM/DSS, they will become more efficient and companies' performances will be based more on their ability to absorb CRM/DSS based on efficiency and innovation.

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