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Building equity across the customer lifecycle

Dynamic Marketing Optimization for Telecommunications Service Providers

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Introduction

Making marketing more accountable is now a battle cry across industries[1]. At the same time, marketing's dual role – to drive short-term sales and long-term brand equity – complicates clear and unbiased measurements. Performance measures are often tied to specific customers or channels, and grouped by discrete categories such as awareness, preference, purchase intent, customer satisfaction and loyalty, share of requirements, shelf space and the like.[2] Unfortunately, this information, while valuable, does not reflect the financial impact on a business.

Not surprisingly, marketing departments are now being asked to link their performance more directly to their company's bottom line, in a way that translates across the enterprise, as well as with shareholders. Marketing expenditures can then be assessed in terms of how they contribute to an organization's profitability, growth and sustainable competitive advantage.

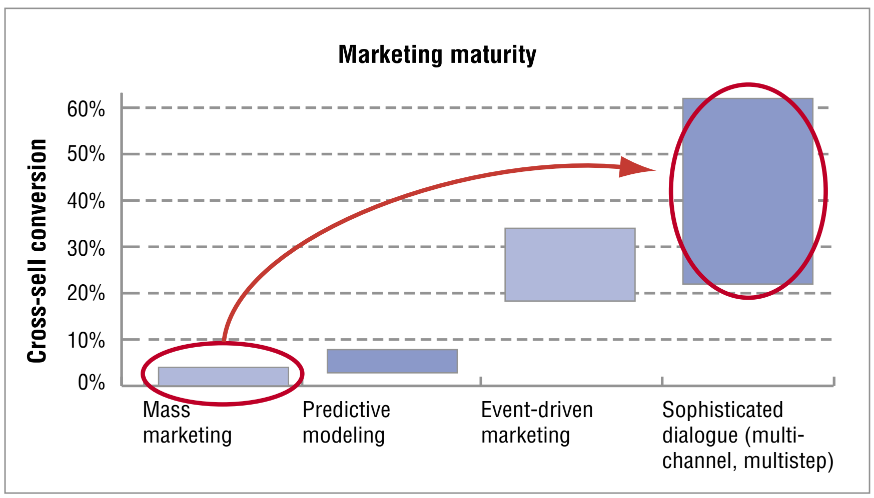
The case for advanced analytics

The evolution of marketing strategies, coupled with increasingly complex market conditions, present some formidable challenges for today's businesses, including those in the telecommunications industry. Marketing executives are now expected to reduce costs…work with fewer resources…develop campaigns that hit the market faster…generate better leads…drive higher revenues…and increase customer retention rates. These demands are punctuated by a number of factors: an expanding number of communications channels, direct-marketing restrictions (e.g., "do not call"), the emerging role of the contact center in supporting sales activities, and a more independent customer base. All place a heavy burden on marketing departments.

At the same time, companies must continually look for better ways to protect their market share and margins, secure future growth and capitalize on their marketing investments. While the role of marketing has matured over the past decade – evolving from a mass-marketing approach to more personalized and event-driven campaign and service programs – a new trend is emerging.

Today's enterprises are looking to establish multichannel, multistage dialogues with an increasingly critical customer population. This objective requires real-time access to relevant, accurate and forward-looking data, plus the ability to effectively act upon information in the most efficient and effective way, across channels. Yet in their efforts to cope with these challenges, many companies have found it hard to achieve even a reasonable return on investment from their customer relationship management (CRM) initiatives.

The evolution of marketing



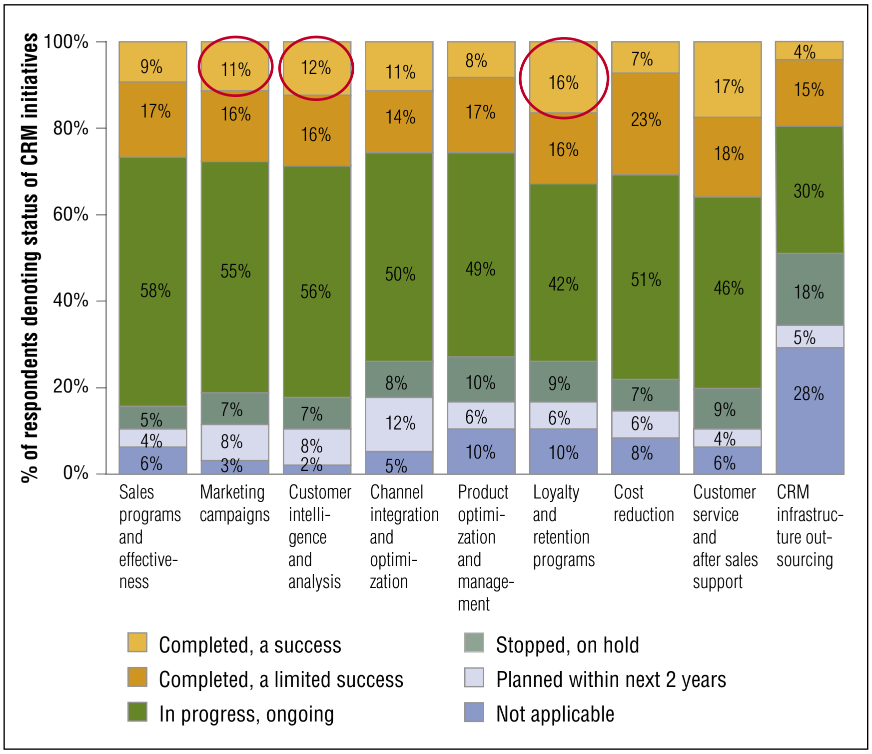
Source: Erasmus University/Rotterdam School of Management Research, 1999-2001.

Recent IBM research indicates that across the board, only 30 percent of companies regard their CRM investments as successful. Not surprisingly, customers have it even worse; they often don't receive the type and level of support they need due to the wrong offers – conveyed through the wrong channels, at the wrong time.

As it turned out, many of these CRM programs were ineffective because of:

- The inability to develop a single view of the customer, due to data-quality issues and difficulties in gathering data from multiple sources.
- A lack of business processes and technology to effectively coordinate customer-focused activities across the enterprise, at every customer touchpoint.
- The inability to provide customers with a consistent, value-enriched experience across channels – the Web, the store site, the call center and e-mail alike.
- The tendency to take a reactive approach to customer information, rather than using it to deepen customer insight and build loyalty with valued customers (instead of managing churn with those customers who have indicated their intent to leave).
- Customer segmentation, transaction/purchase pattern analyses and churn predictions do not provide actionable insight, or an understanding of what actions, in what sequence, can optimize customer value within marketing's budget and risk constraints.

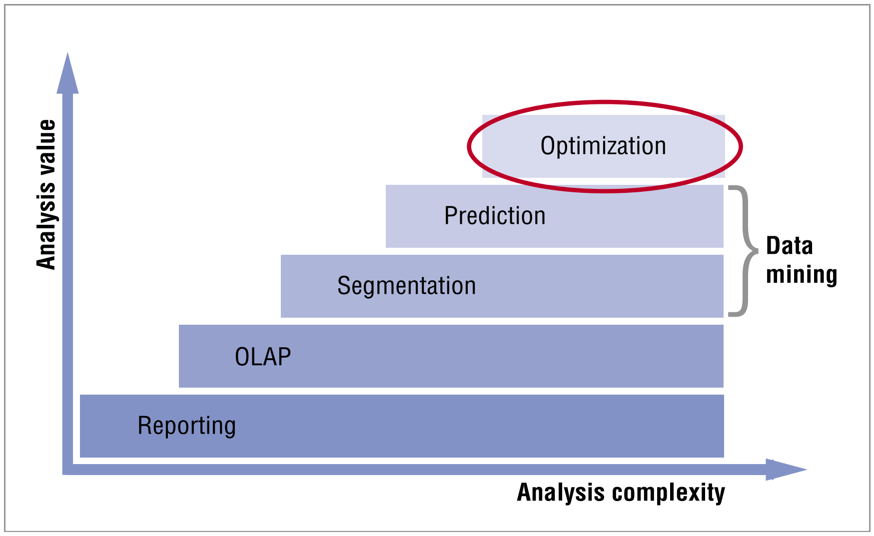
What is the status of each of the following CRM-focused initiatives in your company?



Source: IBM Institute for Business Value, 2003.

To overcome the key challenges of customer relationship management, today's marketing managers must have the level of business insight necessary to control marketing spend while increasing customer value. This requires a more sophisticated segmentation and targeting strategy, and intelligence that focuses on marketing ROI as critical to facilitating a sophisticated, multichannel, multistage customer dialogue.

Value vs. complexity of analytical approaches



Actionable intelligence encompasses more than current customer analytics tools and data-mining practices; it calls for a radically different approach that optimizes a portfolio of campaigns (i.e., offers, channels, timing) with budget and risk constraints to maximize customer lifetime value over a given time horizon.

Looking at the telecommunications sector

Recent marketing trends have also clearly affected the telecommunications industry. In developed countries, the market is characterized by sluggish GDP (gross domestic product) growth, stagnating populations and high saturation levels, all of which have reduced most telecom service providers' (TSP)[3] opportunities to pursue a volume-based growth strategy.

While the absolute number of telecom service providers has increased, deregulation and technology advances have blurred the distinctions between services – fixed, wireless, cable and Internet – offered by TSPs. Cable companies are entering the local telephony space, and wireless providers now offer both domestic and international long-distance voice and data services. These factors have created more competition among incumbent players. The mere offering of a specific product or service is no longer considered a differentiator, and the resultant price wars have reduced the industry to commodity status. Overall, this has resulted in more competition, more consumer power and less overall growth – a trend that is now being felt acutely by TSPs, who are seeing a decline in profitability and cash flows[4].

These developments have led to a shift in strategic focus – from customer acquisition to customer management. TSPs are thus turning their attention to customer development, loyalty and retention – building individual customer revenue over time, and retaining “high-value” customers in a cost-effective manner.

For both telecom service providers and VNOs (virtual network operators), future opportunities will evolve around the customer. Differentiation will depend on the ability to target high-value segments; provide those customers with an experience that reflects their needs; retain them at key points in the customer lifecycle; expand service penetration; and increase total spend over time.

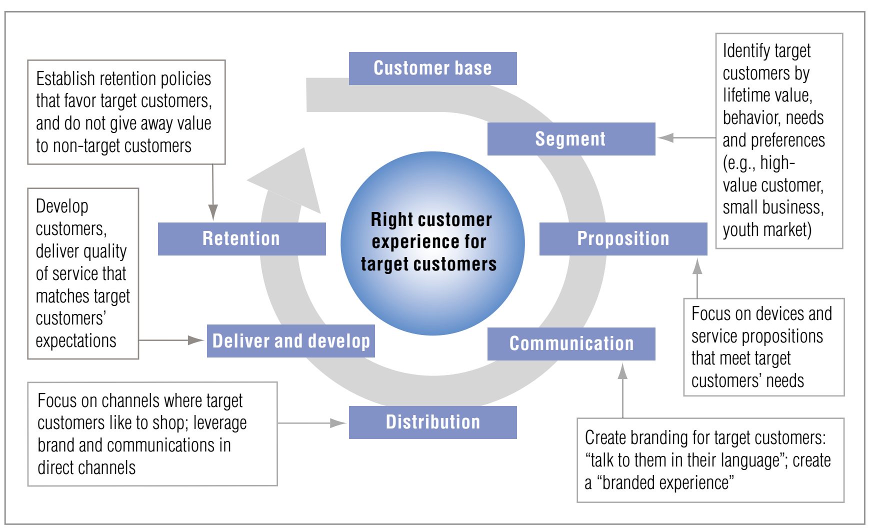
In short, enterprises must confront three main challenges[5]:

- *Market and promote to potential customers cost-effectively.* Here, the challenge is to analyze and control offers so that they fit customers’ needs and preferences.

- *Retain the right customers cost-effectively.* This challenge has three aspects: First, companies must identify the customers they are in danger of losing before they lose them. Second, they must target the customers they want to keep and those they are prepared to lose. Finally, they must take the most appropriate proactive (vs. reactive) actions to retain their valuable customers.
- *Understand customer profitability.* Organizations must be able to forecast future revenues from customers, as well as the costs of retaining and servicing them.

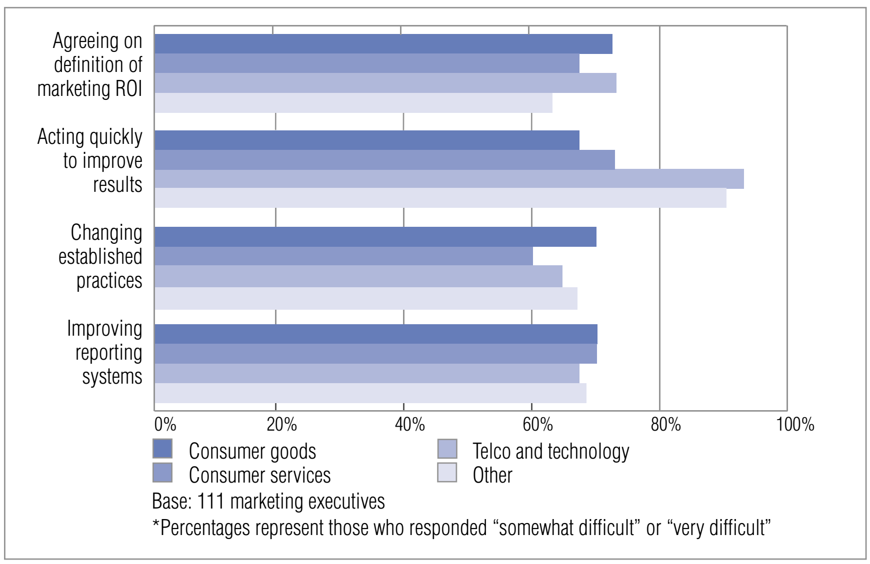
Providing a branded customer experience that differentiates a company from its competitors requires a deep understanding of customer needs, crisp strategies for meeting and exceeding those requirements, and consistent delivery of products and services across touchpoints, throughout the customer lifecycle. To deliver these capabilities, telecommunications service providers will have to rely on employees who are committed to providing the desired experience in all customer interactions. At the same time, they must be equipped with the right tools, have access to integrated systems and processes, and be afforded accurate, timely management information[6].

Delivering a superior customer experience will drive differentiation in a highly competitive marketplace



Thanks to the availability of detailed records on calls, text messages, downloads and other vital information, telecommunications operators are in a highly privileged position to know how, when and for how long their individual customers use a particular product or service[7]. Enterprises in other industries – including consumer goods companies and brands such as Nestle, Coca-Cola and Mars – are not privy to this type of rich information. For example, Mars sells millions of chocolate bars at a time to major retailers and wholesalers, who then sell the bars to end consumers or smaller retail outlets. Mars does not know when and where their chocolate bars are consumed or by whom, so it must rely on expensive, sample-based market research or on-product promotional offers[8].

"In improving marketing ROI, how difficult are each of these tasks?"



"Where is Marketing Measurement Headed?" Jim Nail, Forrester, 2005.

Transforming the goldmine of data available to TSPs into actionable intelligence and exploiting the many opportunities that are hidden in customer-related data requires analytical capabilities that view the customer base as an asset and a portfolio that must be managed. However, this is easier said than done. Research[9] indicates that while there are technical challenges in building reporting systems and aggregating data, a nearly unanimous 95 percent of TSPs cited the ability to act quickly on marketing ROI analysis as the most difficult issue. Furthermore, almost 75 percent admitted that their company had difficulty agreeing on a definition of marketing ROI.

Enhancing customer-centricity: From loyalty to equity

Although most TSPs have made progress in becoming more customer-centric, full-scale customer management – encompassing customer service, revenue stimulation and retention – presents an even greater challenge as companies strive to deliver differentiated service across multiple market segments and increasingly complex operations.[10] Enhancing capabilities in key areas – the most important being those related to customer insight – can help telecommunications service providers differentiate the customer experiences. By doing so, they will be able to manage their customer portfolio based not only on a "snapshot" view, but also based on customers' longer-term potential.

This requires advanced analytics capabilities. At the same time, dissatisfaction with current analytical CRM capabilities suggests that many telecom marketing professionals are frustrated by the lack of tools available to help them design and implement the types of programs they would like to offer. Most of the analytics systems used by TSPs are well suited to maximizing immediate revenue from a single marketing campaign and a single communications channel; however, these tools do not contribute to a well-planned, carefully managed environment that optimizes targeted marketing policies across channels and customer segments, throughout the customer relationship.

This highlights the need for an extended analytics portfolio that encompasses both *Descriptive Analytics* (understanding the relationship) and *Prospective Analytics* (managing the relationship). Armed with these capabilities, service providers will be able to understand the needs and relative lifetime value – or profit contribution – of individual customers, and thus drive more profitable revenue growth through better-targeted and more efficient marketing. They will also be equipped to design different experiences for different customer sets, which in turn can increase customer satisfaction, improve overall customer lifetime value, and build customer equity.

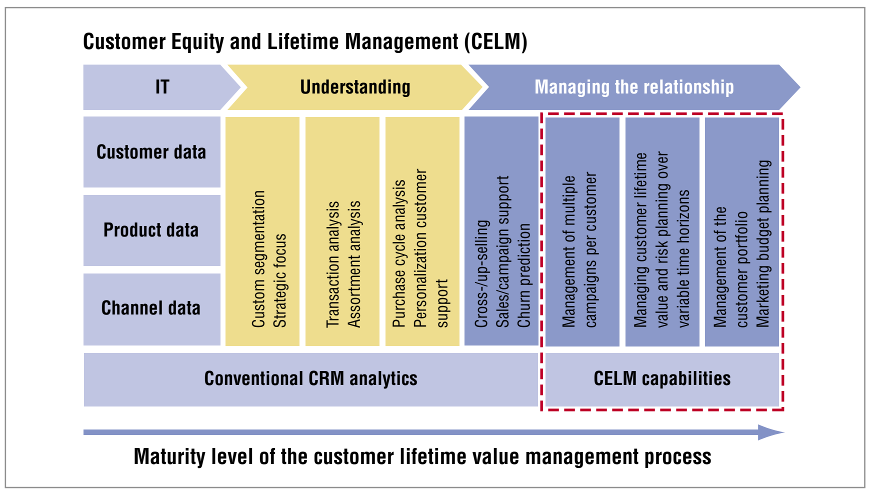
IBM Customer Equity and Lifetime Management (CELM)

In response to the analytical needs of the marketing industry, research scientists from IBM Research have developed the Customer Equity and Lifetime Management (CELM) solution, a unique framework for helping marketing managers support and optimize marketing strategies. Using this solution, telecommunications companies can establish a balanced portfolio of cross-channel, cross-segment marketing approaches for optimizing customer lifetime value within the bounds of available, often restricted resources. As such, CELM supports the analysis, simulation and optimization of loyalty and marketing programs, based on the observed and expected lifetime value and volatility (risk) of customers.

"The 3,000 researchers in IBM's labs are moving well beyond the hard science of making computers and programs run faster and more efficiently. They are also focusing on solving business problems and modeling patterns of human behavior–giving their work more of the flavor of social science."
—*The New York Times*[11]

This enables companies to:
- Optimize marketing efficiency and effectiveness, heighten the efficiency of marketing resources (allocated per customer segment), and balance value and risk across the customer portfolio.
- Improve customer-targeting policies by associating customers' future actions vs. their next action.
- Develop long-term relationship strategies and maximize ROI for each customer/segment.

Positioning CELM in the CRM analytics environment



CELM technology is rooted in patented extensions of leading-edge mathematical algorithms. Using techniques like Markov Chains and Markov Decision Processes to model customer dynamics, CELM presents a set of marketing actions that maximize the likelihood of customers transitioning to higher value/loyalty states over a given timeframe (Customer Lifetime).[12]

When combined with business partner offerings or individual proprietary solutions, the IBM Customer Equity and Lifetime Management (CELM) solution furnishes telecommunications providers with the industry's first comprehensive enterprise loyalty-management solution. CELM enhances the capabilities of loyalty solutions by providing optimal marketing plans under marketing budget constraints for each customer segment. These marketing plans are then fed into the business partner's or a company's proprietary modules for operational execution.

The IBM CELM solution was awarded the Best Practice Prize 2005 by the prestigious INFORMS Society for Marketing Science (ISMS).

CELM employs Mathematical Finance for Asset Valuation (over variable time horizons) and Portfolio Optimization techniques – helping to bridge the gap between CRM and Financial Engineering. This is achieved by considering the customer base as a portfolio of financial assets and managing them accordingly. Future customer value over variable timeframes is calculated using advanced probability modeling techniques. This enables companies to understand the financial profile, value and risk (Customer Equity) of the customer over a specific period of time.

The CELM solution also utilizes diversification/hedging techniques to determine how best to optimize available marketing dollars across the customer portfolio, with the objective of maximizing ROI. This approach is radically different from common campaign management methods, which do not consider correlations between different customer profiles and the mutual or delayed effects of multiple campaigns.

CELM models the customer relationship as a journey through various critical states in the customer lifecycle, and recommends actions and a budget for each state/time to maximize lifetime value and minimize risk. Numerous factors can be considered – enabling companies to craft various targeting policies for a given customer, in the context of:

- A given timeframe
- Available budget dollars per target
- The risk appetite of the marketing manager (aggressive, risk-averse, neutral, etc.)
- The types of available marketing actions, or options (such as campaigns, offers, promotions, etc.).

Since CELM software components are all Java™-based, they can be easily integrated with a company's existing CRM programs, including campaign management and call center software from Strategic Alliance Partners such as Siebel and SAS as well as proprietary software an organization may have developed.

The CELM solution makes it possible to visualize market dynamics; respond to marketing actions/marketing campaigns via a graphical representation of segment dynamics; compute the effect of selections as transition probabilities from segments to segments; and view their evolution over time.

The benefits of CELM

The benefits that can result from the CELM solution apply to segmentation, customer dynamics, portfolio optimization and service differentiation:

- *Segmentation:* CELM helps companies define and/or redefine customer segments based on advanced value and loyalty metrics, in addition to traditional demographics and transactional metrics (such as recency, frequency, etc.). The result is a collection of value-loyalty states that characterize key phases of the customer lifecycle.

- *Customer dynamics:* Using CELM, enterprises can identify customer transitions (the probability of moving to a higher/lower value state); estimate customer lifetime value and risk (volatility); predict the impact of future marketing action sequences on customer lifetime value; identify optimal future marketing policy; and assess historical and optimized marketing policies. It is important to note that CELM estimates the optimal budgeting and scheduling of marketing plans over variable time horizons. This is in contrast to traditional campaign management systems, which manage single campaigns one at a time, and do not take into account the mutual dependencies and impact (the portfolio effect) of various campaigns over time.

- *Portfolio optimization/service differentiation:* CELM helps companies allocate limited marketing funds to maximize return on investment and minimize risk (uncertainty). While this approach has been used primarily to plan and schedule marketing campaigns, the customer insights gained provide the opportunity to distinguish service via targeted marketing and service differentiation – in conjunction, or as a focused series of steps designed to increase customer value.

As such, CELM can directly affect a company's bottom line and drive better overall business performance by:
- Improving marketing efficiency and effectiveness
- Optimizing budgets and resources per customer segment over variable timeframes
- Maximizing the value/risk ratio across the customer portfolio.

This process enables telecom service providers to set up and budget for comprehensive marketing plans (i.e., sequences of actions) vs. individual actions.

How does CELM work?

The CELM solution generates actionable business intelligence based on a predefined, two-step approach:

Step 1: As a diagnostic tool, CELM allows enterprises to assess the impact of previous marketing policies on customer dynamics, across the different value and loyalty states. This step is critical to identifying the marketing sequences that have had the best and most significant impact on customer behavior. The chart (snapshot) below shows an example of historical customer transitions and marketing actions that led the customer to a churn (defector) state.

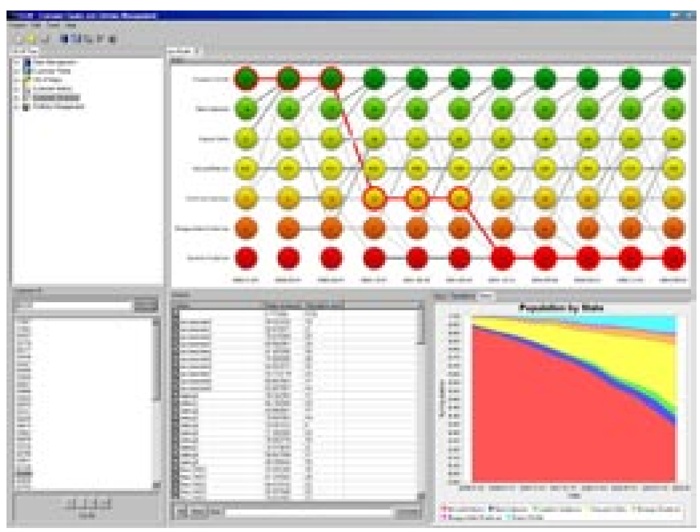
Finnair

In the spring of 2002, Finnair — Finland's flagship airline and one of the industry's most esteemed air carriers — partnered with IBM Global Services and IBM Research to develop advanced customer-value management solutions to increase customer loyalty, lower marketing costs and boost response rates among members of Finnair's frequent-flier program. Supported by CELM, the initial phase of the project, which involved half of Finnair's frequent fliers, reduced the airline's marketing costs by more than 20 percent and improved response rates by as much as 10 percent. The accuracy rate for predicting future customer value through a series of subsequent campaigns was 80 percent.

A global CPG company

This consumer product goods company manufactures a strong portfolio of high-end products that are distributed to consumers through various channels (the call center, the Web, stores and mailings). The enterprise turned to IBM Business Consulting Services for help in optimizing its marketing policies, proactively promoting up-selling and cross-selling, and minimizing churn throughout its customer base. Using CELM's advanced analytics, IBM helped the company optimize customer equity throughout its customers' lifecycle. The company has seen an increase in revenue – the result of an actionable plan for minimizing defection and/or transition to low-value segments and maximizing up- and cross-selling opportunities. By leveraging its resources and maximizing the value/risk ratio across its customer portfolio, the company is also enjoying a higher marketing ROI.

Step 2: In a predictive phase, CELM finds optimal targeting policies (sequences of campaigns) that maximize the likelihood of customers transitioning to higher-value and loyalty states over time. It is important to note that these targeting policies are derived from the budgeting constraints that are set by the marketing manager. The optimization algorithms identify the best portfolio of campaigns and the best time to schedule them, in a way that maximizes customer value/risk ratio over a specified time horizon (weeks, months and quarters). The chart on the next page illustrates how a given (new) customer is more likely to evolve under the optimized marketing plan if targeted with the new policy. This suggests acting on the customer in the early phases of their relationship with the company in order to maximize their loyalty, instead of waiting until they approach a churning state.



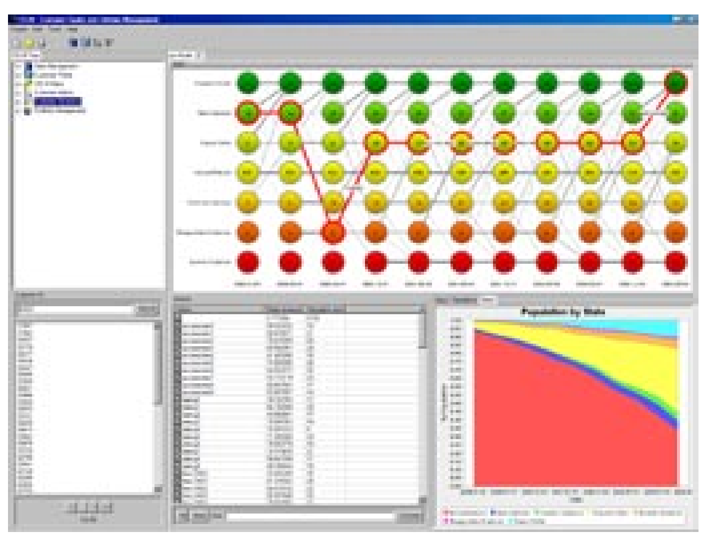
To support this approach, the CELM solution provides four main analytic building blocks:

1. *Modeling:* Advanced algorithms to discover segmentation and value-transition rules

- What are the most discriminating customer features (transactions, assortments, etc.)?
- How do these features combine to form segments with homogeneous characteristics and behavior?
- What are the key thresholds and discriminating parameters of each segment?
- What customers have similar behavior patterns in terms of value and loyalty along the most discriminating factors?

2. *Simulation:* Advanced algorithms for the discovery of customer-transaction association rules and sequential purchase-cycle patterns

- What are the transactional characteristics for the customer profiles and products/services within a segment?



- What are the typical buying patterns within the spectrum of products/services that a company offers?
- What are the similarities and differences of purchase behavior regarding products/services within a certain segment, over a given period of time?
- How many customers in a certain segment show statistically similar buying patterns over time?
- When does the customer buy a product?
- When is it appropriate to introduce/offer a new promotion/product?
- What is the likelihood of a customer dropping "Product A"?

3. *Portfolio management:* Advanced algorithms of stochastic optimization over a portfolio of marketing actions, customer segments and communications channels

- What is the number of customers to target in each segment in order to maximize the expected profit over a given time horizon?
- What set of promotions is relevant for what customers?
- What percentage of each type of promotion should be offered to what customers?

Sample Case Study 1

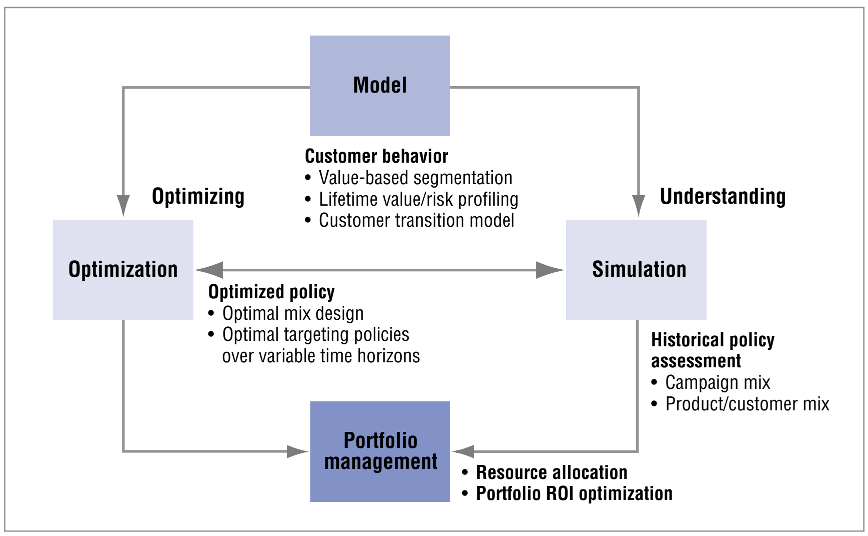
Increasing customer profitability

Problem: 80 percent of the customer base consists of customers with a negative or low profitability. Those with a negative profitability should be presented with attractive campaigns to move them to higher profitability levels.

Solution: Based on the marketing budget available for Q1 and Q2, and the risk profile that is preferred for moving the customers to a higher profitability level, CELM predicts and suggests five subsequent campaigns for each value/loyalty sub-segment in order to optimize profitability for each of the customers under consideration.

4. *Optimization:* Algorithms for portfolio optimization and dynamic programming to balance the investment in the optimal portfolio, based on customer value-risk profile

- Given a limited budget and a policy, how do we select the number of customers to target in each segment in order to minimize cost and risk while maximizing the expected profit over a given time horizon?
- How do the most cost-intensive marketing activities contribute to overall performance?
- How do we exploit the correlations between marketing actions to better manage budget dollars?



Sample Case Study 2

Retention program enhancement

Problem: Customer churn rates are high, retention programs are costly, and there are limited success rates with retention offers.

Solution: Based on historical transactional data, CELM predicts trajectory paths that newly acquired customers will follow over the predicted customer lifetime. Sequences of campaigns are identified to treat customers in the most effective way, prevent churn, and enhance customer loyalty in the early stages of the customer lifecycle.

Sample Case Study 3

Segment value enhancement

Problem: The "youngsters" segment is underperforming in terms of uptake of new services. There are no ideas for better promoting new products/ services and increasing campaign response rates.

Solution: CELM re-segments the "youngsters" into different value/ loyalty sub-segments. CELM then proposes three targeted campaigns for the next quarter to drive this segment to a higher value/loyalty state.

To perform these critical and unprecedented calculations, the CELM model requires a basic set of historical data on customer profiles and segmentation (e.g., demographics, tier-based segmentations, etc.); sales and transactions (e.g., products/services, volumes per product/service, prices, sales dates, etc.); marketing activities and campaigns (e.g., past campaigns, budget allocation, response, etc.); and complementary market research data (e.g., wallet-share per product, overall market volume per product, competitors' marketing campaigns, etc.). Data format and data repository characteristics are not critical to the applicability of the CELM solution.

How companies can apply CELM

The flexibility of the CELM solution applies to a wide variety of marketing, sales and service (call center) processes, enabling telecommunications providers to:

- Identify the most valuable customers and their value drivers
- Define and/or optimize customer segmentation
- Optimize the product and services portfolio
- Develop marketing strategies (product, pricing) tailored to individual customers or specific segments
- Identify cross-selling opportunities
- Focus on acquiring valuable customers to increase revenue and profit
- Reduce costs by avoiding unprofitable sales or marketing activities
- Identify customer transitions (the probability to move to a higher/lower value state)
- Confirm control points to proactively manage value and loyalty
- Predict the impact of future marketing actions on customer lifetime value and risk

- Assess the historical portfolio effect of existing campaigns
- Determine what sets of marketing actions should target what customers/ segments over given planning horizons
- Define an optimal future marketing policy to push customers to more valuable segments and reduce the probability of defection.

Leveraging the experience of a proven global leader

With more than 190,000 business, industry and IT experts – including telecommunications industry consultants from IBM Business Consulting Services – IBM Global Services is helping companies everywhere blend business, science and technology to transform customer relationship management.

IBM Research employs 3,000 researchers in eight labs across the globe. Over the years, their work has resulted in five Nobel prize winners, five U.S. National Medals of Technology, five National Medals of Science and 19 memberships in the National Academy of Sciences. IBM Research personnel include more than 46 members of the National Academy of Engineering, and well over 300 industry organization fellows. Among the numerous patents and awards that IBM Research has received for development of innovative data- mining technologies: The Association of Computing Machinery (ACM) 2003 Test of Time Award for the most innovative algorithms that have impacted research and business in the last ten years. In addition, the IBM CELM solution was awarded the 2005 Practice Prize of the INFORMS Society for Marketing Science (ISMS).

Find out more

For more than 80 years, IBM has helped businesses innovate. Today, we are assisting telecommunications service providers worldwide in taking the best advantage of emerging opportunities associated with convergence, deregulation, and mergers and acquisitions. As a global industry leader in providing business solutions to the telecommunications industry, IBM offers CRM solutions that can help create measurable value for customers, reduce costs and enhance revenue opportunities.

To find out more about how the IBM Customer Equity and Lifetime Management solution can help your company refine its marketing efforts, please visit:

ibm.com/industries/telecom

To learn more about IBM Business Consulting Services for Telecommunications, please visit:

ibm.com/services/us/bcs/html/bcs_telecommunications.html

About the authors

Dr. Abdel Labbi is CRM Research Leader of IBM Research Labs in Zurich, Switzerland. His research, teaching and consulting activities in the last 15 years have been focused on quantitative approaches to optimization of various business processes, especially in the CRM area. He has published more than 40 papers in international business and scientific journals and conferences, and holds several patents, including the Customer Equity and Lifetime Management (CELM) solution, which was awarded the 2005 Best Practice Prize of the INFORMS Society for Marketing Science (ISMS).

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