1:1 Marketing Technology Overview

A Marketswitch Paper

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True Optimization.

Background

As can be illustrated by the variety of messages everyone receives each day, 1:1 Marketing can take many forms. Historically, the most prevalent methods have been telesales/telemarketing and direct mail. Other communication channels used for 1:1 Marketing now include e-mail and personalized web sites, where messages and promotions are tailored to each customer or visitor on a 1:1 basis.

1:1 Marketing is big business, accounting for approximately 50% of the marketing dollars spent in the U.S. each year. The $60 billion spent on inbound and outbound telemarketing in the United States during 1999 generated $460 billion in sales of goods and services and employed approximately 8.7 million people. Over $40 billion was spent on direct mail promotions. 1:1 Marketing is obviously in-style, and it is interesting to note that its close cousin, "brand/broadcast marketing," in the form of large brand building/awareness ad campaigns, has lost some of its luster.

Interestingly, the renewed focus on 1:1 Marketing is not being driven by any new strategic marketing insights or by any long-held beliefs that have been challenged. In fact, most 1:1 Marketers have historically agreed with a key central idea:

Each customer's FULL profit potential cannot be fully realized until the marketer completely understands each individual's unique needs and preferences.

The problem 1:1 Marketers have always faced has been the high expense associated with gathering, tracking, and digesting customer information at such a finite level. Additionally, it was impossible to make this information practically actionable – to determine which offer to give to each customer in order to satisfy them and achieve the maximum profit out of the interaction. This was an immensely complex task.

During the past 10 years, technology has been catching up, setting the stage to deliver a step function improvement in the way that 1:1 Marketing activities are planned and executed. Many of these technologies have been developed within a broad solution set known as Customer Relationship Management (CRM). CRM, in a nutshell, is an approach to understanding and influencing customer behavior through meaningful communications in order to improve customer retention, customer loyalty, and customer profitability. CRM encompasses not only Marketing, but all touch points within a company, including Customer Service and Support. It is a holistic way of looking at the customer.

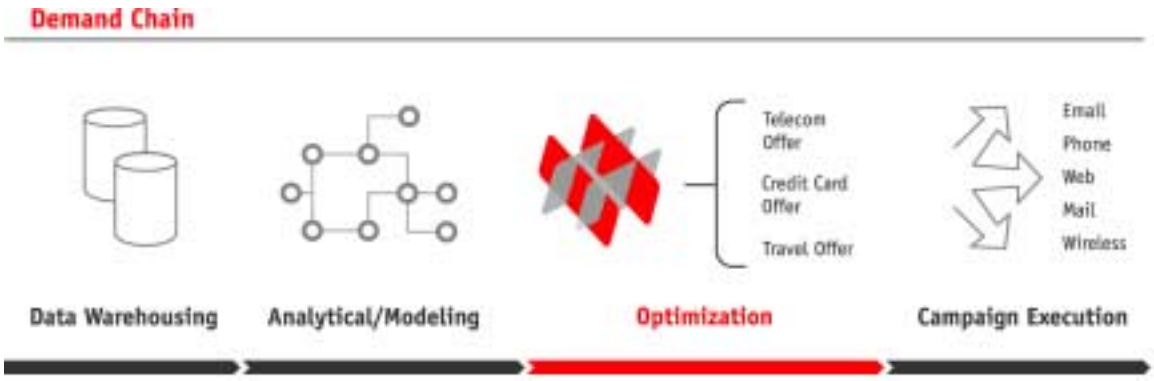
The goal of this brief paper is to accomplish the following:

- Discuss the different types of solutions that are available to 1:1 Marketers
- Discuss the capabilities and benefits of each
- Discuss how the solutions interrelate with one another
- Detail out a few vendors in each of the specific areas

The 1:1 Marketing Landscape

From a 10,000 foot view, planning and executing a 1:1 Marketing campaign can be grouped into 4 steps that can be thought of as a sequential Demand Chain:

- Data Warehousing
- Data Mining/Modeling
- Marketing Optimization
- Campaign Execution



Each of these steps is a critical piece to the 1:1 Marketing puzzle. When all of the pieces are implemented successfully, the resulting 1:1 Marketing activity will be tuned for maximum effectiveness.

Data Warehousing

An organization's Data Warehouse is its centralized store of detailed information about each of their customers, their behaviors, and their preferences. The Data Warehouse is typically a combination of detailed demographic data on a customer, combined with a historical transactional history. Transactional histories would include not only the purchases that were made by the customer, but would also include contact or interaction data such as what type of promotions were made to each customer, which ones did they respond to, have they ever called on their own with support related questions, or to inquire about a

certain product, etc. Data Warehouses are also capable of housing information from eCommerce sites, such as clickstream logs. In short, the Data Warehouse is a gold mine of information.

Obviously, the Data Warehouse is used by a large number of people, within Marketing as well as many other departments within the organization (such as Customer Support). As recently as a few years ago, Data Warehouses were typically only updated daily, or even monthly. Now, state of the art Data Warehouse technology is capable of being continually updated with the latest available customer information (critical for interactions through channels such as call centers and the web). Typically, Data Warehouse systems are designed to be accessible around the clock given the criticality of the customer information.

Data Warehouses usually include some sort of basic querying or "lookup" tools that allow the Marketer to run searches on the data. For example, Marketers can query the Data Warehouse to determine which customers spent more than $100 on sports merchandise during the past six months.

A final note, companies often find that they have incomplete data files on certain customers, or realize after the fact that they wish they had been capturing certain information on customers. Businesses have sprung up to provide this type of information to customers. For instance, there are companies that track and house information (over 200 distinct data fields) on all of the 100M households in the United States. They sell this data to businesses so that companies can build a complete view of their customers and prospects. Strict privacy standards need to be adhered to by these companies (and all companies accumulating data) to stay compliant with local and federal laws protecting the privacy of consumers.

Data Mining/Modeling

Data Mining, as the name implies, is a process of selecting, exploring, and modeling large amounts of data to uncover previously unknown patterns. Applications of Data Mining technology include:

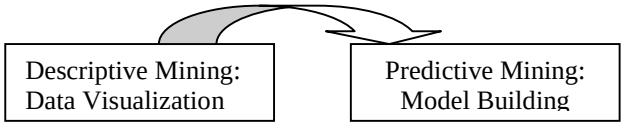
Customer Profitability – For a given customer and a given product promotion or offer, what profitability could the company expect in return. In the credit card industry for example, a customer's likelihood to maintain balances on their credit cards would be a determining factor on their profitability if they were to select a particular credit-card offering.

Customer Retention – Patterns may be detected or modeled that will predict that when a customer exhibits a certain type of behavior, they may be at high risk of "churning" or moving to a like service or offering of a competitor.

Customer Segmentation – Patterns may be detected which allow organizations to rationally group individual customers into larger groups or segments for marketing purposes. For example, a pattern may be detected that "Men, ages 35-45, that have spent $300 in the past 6 months, exhibit similarities in certain other historical action patterns." Hence, this might be a viable segment for the marketers to treat differently.

Customer Propensity – Given the data that is available for each customer, promotion offers and/or products can be scored for receptivity. At the end of the Customer Propensity process, the marketer gets a report for each potential offer that lists out each customer and their relative likelihood of accepting a solicitation on that particular offer.

The Data Mining category can be broken into two general areas, often used in tandem:



- Data Visualization
- Data Characterization

- Create Models
- Score Data

In the first step, Marketing Analysts query the raw data to look for interesting trends. Examples would include discovery items such as:

- "76% of our sales last month occurred in only 6 states."
- "Although we have 20 different sku's in that category, 90% of the shipments were in the following two items."
- "Most of the customers that purchased the DSL service bought a PC on the AT&T credit-card 30 days prior."

During the Model Building & Analysis step, models are built that predict the value of an outcome variable (such as the "propensity" to accept a particular offer) based on the values of other known variables (such as age, income, gender, mortgage ownership, kids, previous transactions, etc...). Using sophisticated underlying technologies (such as Neural Networks, Decision Trees, Logistic Regression), models are "created" off a sampling of the existing data set and then are applied back to the entire customer data set in the Data Warehouse to "score" each customer record.

At the end of the customer propensity modeling process, what the marketer ends up with is a set of files, one for each offer or promotion. Each file has a unique record defining the customer and an associated propensity score representing the likelihood of that customer to accept that offer. If there are one hundred potential offers…one hundred files. If there are four offers…four files.

Lets look at a simplified credit card promotion to illustrate the point. Assume a credit card company has 4 different credit cards it is interested in marketing to its prospect list of customers. The credit card company can build customer propensity models for each card using Data Mining and then score the customers in their Data Warehouse to determine their likelihood of accepting each of the four credit card offers.

Card A		**Card B**		**Card C**		**Card D**	
Customer ID	**Score**	**Customer ID**	**Score**	**Customer ID**	**Score**	**Customer ID**	**Score**
0012987646	.34	0012987646	.22	0012987646	.11	0012987646	.90
0026347890	.42	0026347890	.87	0026347890	.90	0026347890	.21
0078198676	.67	0078198676	.39	0078198676	.61	0078198676	.73
0908897341	.83	0908897341	.91	0908897341	.87	0908897341	.92
9087438402	.71	9087438402	.81	9087438402	.91	9087438402	.01
6934691873	.97	6934691873	.90	6934691873	.55	6934691873	.11
6289287528	.11	6289287528	.19	6289287528	.91	6289287528	.74
2587625827	.89	2587625827	.09	2587625827	.94	2587625827	.02

Marketing Optimization

Marketing Optimization is the newest entrant to the 1:1 Marketing scene. Before delving into Marketing Optimization, it first makes sense to examine and better understand the general process of Optimization.

At its core, Optimization is an allocation process. Advanced mathematics are employed during Optimization in order to allocate fixed or finite resources in a manner that ultimately will maximize an overall function, known as a utility function. While doing this, the process simultaneously considers and satisfies lower level constraints or requirements. Optimization, as a mathematical science, has been applied in a number of industries outside of Marketing for many years.

For example, American Airlines uses Optimization to manage its business operations. American's constrained resources are planes, seats, pilots, gates, passengers, etc. It applies optimization to these resources in order to maximize its desired utility function for the business, profit. Here is what then CEO, R.L. Crandall, said about the impact of optimization on his company:

"Yield management (Optimization) is the single most important technical development in transportation management since we entered the era of airline deregulation in 1979…We estimate that yield management has generated $1.4 billion in the last three years alone and we expect yield management to generate at least $500 million annually for the foreseeable future."
R.L. Crandall, CEO, American Airlines, 1992

American Airlines did not fly any more flights after Optimization than it did before. It gained its incremental profit from simply "re-shuffling its existing deck," allocating its resources in an optimal fashion to get the most out of its "transportation machine."

This same core capability is now available for 1:1 Marketers. This is an important addition for two primary reasons:

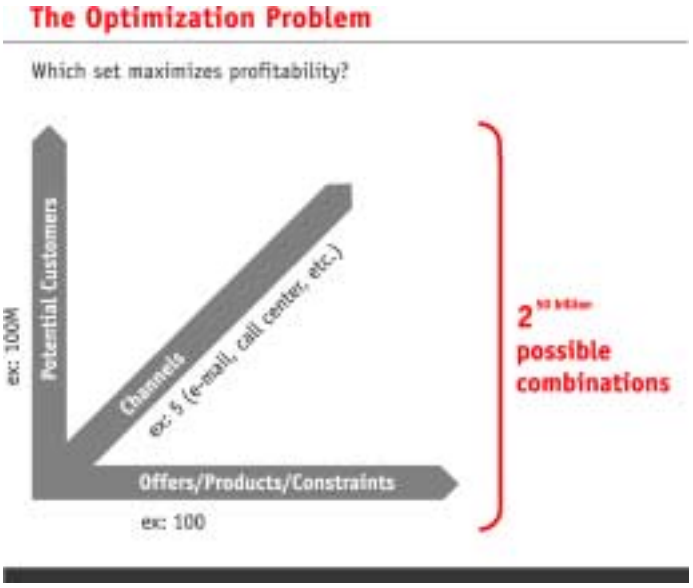
- Marketing has the responsibility, at the end of the day, to drive the maximum amount of profitable revenue growth that it possibly can for the business. Simply stated, it needs to maximize the utility function of profit.
- Marketing has constrained resources, each with interdependencies to one another, that it needs to allocate effectively to achieve its goals. These include:
  - Number of potential prospects or customers
  - Number of potential offers
  - Number of communication channels (some with capacity limitations)
  - Defined budget
  - Product (product line) unit or revenue goals to be achieved (while simultaneously maximizing profit)
  - etc.

Lets take the same example of a credit card company to see how Optimization would be used. Before we looked at a simple situation with 4 offers to illustrate a point. In actuality, today's Marketers at credit card companies have at least 100 potential credit card products they can target to its customers at any given time. The universe of potential prospects they may target is over 100M people (a percentage of the number of households in the U.S.). Additionally, the company has a few different communications channels from which to choose: e-mail, telesales, direct mail, etc.

Given this scale, marketers have quite a potential set of combinations to look at. $2^{50 \text{ billion}}$ to be precise.

Combinations to consider = 100M Prospects x 100 Potential Product x 5 Communication Channels = $2^{50 \text{ billion}}$

Each combination will or will not be executed by the marketer. It is a yes/no decision. Hence the problem is binary and can be characterized as $2^{50 \text{ billion}}$. Graphically, the problem can be viewed in this way:



Somewhere within this set of combinations is THE specific answer to maximize the utility function. In our example, this answer will tell the Marketer which promotions to send to which customers through which communication channel in order to maximize the credit card company's profit and satisfy any lower level goals and constraints. Marketing Optimization provides this answer. It balances the preferences of the customer, the profitability of the offers, the multiple goals of the corporation and finds the correct choices, on a grand scale that satisfies all parties, all under the umbrella of maximizing profit.

Marketing Optimization accepts as inputs information such as:

- Customer propensity scores for each potential marketing offer (from Data Mining)
- Economic data on each offer (Costs, Revenue, Profit)
- Costs associated with each communication channel (deliver costs, cost of a call, etc.)
- Lower level constraints such as:
    - Maximum or minimum overall budget
    - Minimum acceptable sales of a certain product or set of products
    - Maximum amount of solicitations per customer

Marketing Optimization will produce a "blueprint" of the appropriate combinations of Customer-Offer-Channel that, when executed, will satisfy all of the company's constraints and maximize the company's overall profitability.

Marketing Optimization Blueprint:

Customer Id	Offer	Communication Channel
0012987646	10% Card, SI Affiliate	Telesales
0026347890	16% Card, 12 month terms	E-mail
0078198676	7.8% Card, 10,000 Miles	Direct Mail
0908897341	9.5% Card, Balance Transfer	Direct Mail
9087438402	9.5% Card, 2 trades free	Web Site
6934691873	10.2% Card	Telesales
6289287528	18% Card, $2000 Limit	E-mail
etc.	etc.	etc.

Prior to Marketing Optimization, Marketers typically selected the offer for each customer based upon the highest predicted offer propensity the customer had shown…basically following a "give the customer what they want" mentality. Marketing Optimization allows the marketer to balance this mentality against the overall profit and business goals of the company, so that in the end, the customer is satisfied and the business has the best chance of achieving its goals.

Campaign Execution/Personalization

Campaign execution capabilities are primarily focused on allowing marketing activity to be accomplished in the most efficient manner possible. Campaign execution automates and streamlines the process of sending a tailored promotion through a particular communication channel to a specific customer. It takes as its input the direction from the Marketing Optimization process. It then executes the activity and tracks the results, updating the customer response information back into the Data Warehouse so that it can be used for creating and launching the next series of marketing campaigns.

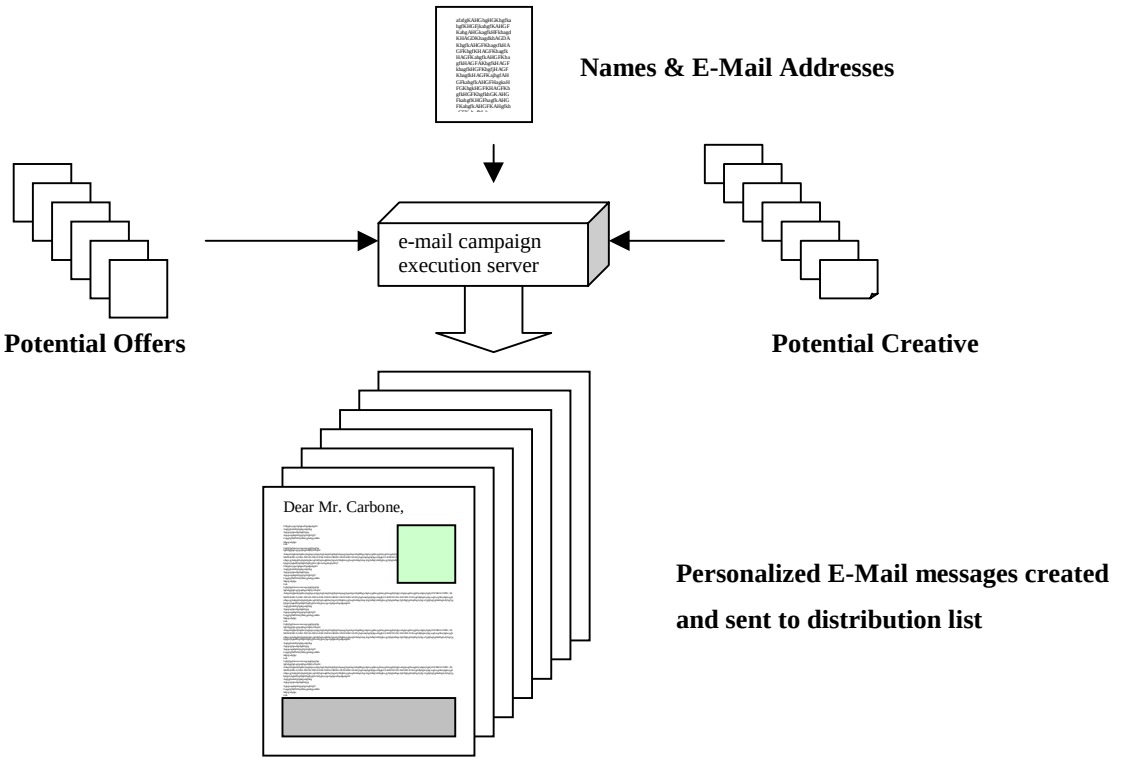
Campaign Execution takes advantage of an enabling technology known as Personalization. Personalization is the tailoring of content to create customized one-to-one interactions. It includes the capture of individual customer information at the point of customer interaction (such as a call center or web site) and the production of customer-specific dialog to interact with a customer. The "content" of the customer-specific dialog is determined through Marketing Optimization. The automated ability to pull the appropriate unique creative or promotional content together for specific individuals is Personalization.

Looking at a few different communication channels can be useful to illustrates how it works:

E-Mail:

A Campaign Execution server typically has the ability to automatically structure and send large amounts of tailored e-mail messages. In an example of a newsletter from a retailer (that would have promotional offers included in it), the server automatically pulls content, as directed by the output of the Marketing Optimization process, from sources such as:

- Promotion/offer content
- Names & e-mail addresses
- Creative treatments
- etc.



Telesales:

The same general concept applies to telesales. When a call center agent is about to place an outbound call, their computer screen will fill with specific information tailored to the person they are about to call. They can then carry out a tailored conversation with each prospect on their call list.

During an inbound call (where the customer calls into a call center, with a sales or service related question for instance), the system typically would perform a “look-up” on the customer. Data Mining, and then

Marketing Optimization, occur in “real-time” and would tell the Campaign Execution server which promotional offer to fill the call center agent’s screen with for that particular customer. Technology has advanced to the point where this process can take place in less than a few seconds, so the interaction between the sales representative and the customer is not impacted.

Web/eCommerce:
Again, the same general concept applies in the real-time web environment. A customer arrives at a web site. Data is mined on the customer, either using login information and the associated data files from the Data Warehouse or from information available on the customer that can be gleaned from the browser software. This information is used in the Marketing Optimization process, and the Web Content Server (Campaign Execution) fills the web page with the appropriate content for that that particular web visitor.

At the conclusion of any customer interaction, the Campaign Execution server updates the Data Warehouse with the appropriate data. What offer was promoted? Was it accepted? Was there any other customer feedback? This creates a closed loop process for the marketer, where the data from the last campaign or interaction will be used to further refine and improve the next one.

Summary

The landscape of 1:1 Marketing has substantially evolved over the past 10 years. Advances in the way that data can be accumulated, modeled and mined, and used to align finite Marketing resources has ushered in a new way for Marketers to maximize the mutual benefit of the relationship between the customer and the corporation.

The sequential process flow from Data Warehousing (data accumulation) to Data Mining (customer preferences) to Marketing Optimization (aligning resources to satisfy customer and business needs) to Campaign Execution (efficient marketing activity followed by reporting/updating of Data Warehouse) gives the Marketer the breakthrough capabilities they require to deliver on the ever increasing expectations of both the customer and the corporation.