Marketing one-to-one and its dependence on knowledge discovery in databases

Dennis A. Pitta
Professor of Marketing, University of Baltimore, Baltimore, USA

Introduction

An increasingly global market

One-to-one marketing was developed by practitioners concerned with the difficulty of competing in an increasingly global market. Academics assert that most industries are monopolistic and therefore most competition strives to achieve differentiation as the basis for success. Thus, consumer marketers stress brand position. They create brand images like, "The Night Time Cough Medicine", "The King of Beers", and "The Super Star of Rent-a-Car". Global competition and developments in production technology have accelerated such differentiation and at the same time have undermined it.

The analog wrist-watch market is a case in point. Jewel lever technology was the basis for analog watch technology for centuries. It was developed and refined in Switzerland and formed one of the foundations of the national economy. After the introduction of digital watches, the analog industry suffered dramatically. The new technology with its new accuracy, economy and novelty, attracted significant volume. The decrease in traditional analog sales prompted the Swiss government to support the development of the inexpensive quartz watch movement. As a result, the quality and prices of quartz wrist-watches fell steadily. Resulting brands like Swatch opened a new segment, the fashion watch market. Swatch tapped a new larger market, which increased total industry sales dramatically. Overall, the result was good for Switzerland. However, the Asia-Pacific region benefited even more and has become a worldwide source for inexpensive and accurate quartz movements. The real result is that in the fashion watch industry, Swatch has even more competitors than the old analog industry. Some start-up competitors, like Fossil, entered business with the objective of selling fashion watches and have done remarkably well. However, blue jeans companies, like Guess, fashion houses, like Tommy Hilfiger and other non-watch companies also market lines of watches produced by Asia-Pacific companies.

A cultural icon of success

Even the older jewel lever watch technology has suffered direct competition. The technology is more expensive and less accurate than quartz analog. To do it right requires added costs. Thus, 21-jewel movements are relegated to very high priced brands such as Rolex. Rolex is so expensive that it has become a cultural icon of success. It is so exclusive that both high quality counterfeit and easy-to-spot fake Rolex products have emerged to compete against the genuine article.

Faced with this scope and intensity of competition, how do marketers win and keep customers? Early attempts have focussed on defending trademarks or winning customers with price cuts or special offers. The Coca-Cola company still defends its trademark by using traveling teams that order "Coke" in restaurants and send samples of the serving to Atlanta for analysis. If the product is found not to be Coca-Cola, the restaurateur may face a law suit with its attendant costs. By publicizing such activities, Coca-Cola deters product switching at the retail level.

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Defending trademarks

Other companies ranging from Microsoft to Rolex have employed private detectives and government officials to swoop down on hoards of counterfeit products, defending their trademarks by seizure. Individual raids may be effective on this illegal form of competition, but the option cannot be used against the real challenge posed by legal competitors.

A different option that is often used to keep customers is price reduction. Price cuts and rebates attempt to win back consumers by offering a bargain. Such attempts cheapen the brand image and erode brand equity (Pitta and Katsanis, 1995). Chrysler corporation's seasonal $1,000 cash back rebate offer became so popular and expected that customers would try to delay purchasing a car until July when the rebate program was anticipated. Customers began to think of Chrysler cars as overpriced and only saleable at a discount. No manufacturer should desire this trap.

Marketing 1:1 versus mass customization

Others have taken a different approach. Authors like Peppers and Rogers (1997) have focused on a technique to satisfy the customer so well that price no longer becomes important. The solution has been to differentiate and target a group of customers with customized products. The next step is to focus on current customers and keep them by enhanced customer service, communication and continued product differentiation. The technique, one-to-one marketing, or marketing 1:1, aims at customizing a product offering so carefully that it fits the customer perfectly (Peppers and Rogers, 1996). One piece of clarification is necessary. Really, success requires two distinct steps. The first, establishing a one-to-one relationship, is really an extension of the familiar market segmentation process. In this case, the firm must understand the specific needs of the market segment – ultimately an individual consumer. The requirement includes somehow retaining what was learned to use in the future.

Mass customization

The second step is mass customization. Mass customization is really an extension of product differentiation. The traditional form of product differentiation involves changing the product characteristics to discriminate one firm's product from another firm's. Differentiation can also assume the role of distinguishing several of a single firm's products from each other. The goal is to fit the product to the customer's needs better. The ultimate goal of mass customization is to fit the product's benefits to the customer's needs perfectly. This step is difficult to achieve because of the nature and complexity of production, but it can be achieved.

In fact, numerous one-to-one relationships can be accomplished by mass customization. It requires a fundamental change in how the business is organized. Information technology is the element which makes one-to-one marketing possible. In order to achieve mass customization, the organization must track large volumes of data, well. Insufficiently deep or well-organized technological resources can prevent one-to-one relationship building.

Examples of marketing 1:1

Most of the examples cited below involve both one-to-one marketing as well as mass customization. The two steps are really inseparable and to get the benefits of a marketing 1:1 relationship, a firm must customize. To get the maximum benefit, a firm must customize *en masse*.

Peppers underscores the importance of his ideas with examples of their successful implementation. In bringing customers value, speed is often of the essence. The Motorola Company is using today's technology to customize its products – quickly to serve the needs of individual consumers. Motorola co-designs pagers with customers and manufactures customized pagers to their specifications. To accomplish this, Motorola's pager sales force visits a potential customer and uses the customer's own specifications to design the pager system that will satisfy the individual customer's needs. Then the salesperson finalizes the specifications on a laptop computer and sends it via modem to the Motorola's factory. Incredibly, over 20 million types of pagers can be specified by a customer and manufactured by Motorola. More incredibly, it is possible for the factory to finish producing the first customized pager of any customer's order in two hours. That kind of customization and speed create an amazingly strong relationship (Peppers and Rogers, 1993).

Even manufacturers of low technology products like blue jeans can benefit from one-to-one marketing. Ask any very short or very tall customer about buying clothes off the shelf. Invariably the clothes do not fit and must be altered at additional expense. Off-the-rack manufacturers cannot unilaterally take the risk of creating clothes for customers with special needs. With the customer's aid and permission, the risks disappear.

An instrument of customer satisfaction

Levi Strauss & Co. is making "mass customization" an instrument of customer satisfaction. In a score of the company's stores, women can purchase "personal pair" blue jeans. These jeans are custom-manufactured to the customer's exact size and fit. To produce these perfectly fitting jeans, the customer and Levi Strauss must collaborate and share information. However, the genius in the process is the customization process itself. This customization is possible with technology bought by Levi Strauss. The process is fascinating. First, the firm take a woman's measurements. After they are taken and checked, they are electronically transmitted to the factory where they are used to make one customized pair of jeans.

The process can be repeated numerous times with different customers, resulting in a versatile assembly line that can produce thousands of custom-made jeans in perfectly fitting sizes. The result is something like a Hong Kong tailor for jeans. The ultimate result is a group of individual customers who have perfectly fitting jeans that cost roughly what an off-the-rack pair would cost (Turk, 1995). So, one at a time, Levi Strauss fits a whole universe of differently-shaped women, and satisfies them all.

On a more high-tech front, customized publishing and printing are mass customization successes. R.R. Donnelley's Digital Division prints individually different documents, with color, picture and print changes made digitally, as the press runs. Amazingly, no manual intervention is required in the process, the press does not have to be stopped, and no in-process adjustments need to be made. The division specializes in print runs of 5,000 or less. This is a one-to-one marketing example, heavily dependent on manufacturing. However, astute site location plays a part. The company located its customized printing operation in Memphis. Why Memphis? It is a Federal Express hub. Thus, a customer can request printed documents via phone or on-line, and then get them shipped out by Federal Express within a few hours.

The system is really ideal for customers who need small runs of printed material like brochures. A variety of customers have this need. For example, trade associations with executive education functions would need brochures publicizing upcoming events or programs. At one or two for each member, most trade association runs might be 5,000 or less. Small runs of brochures might also be ideal for realtors who want to publicize individual houses. It is easy to take a digital picture of a home and just as easy to modem the digital file to Donnelley. After receiving the digital image by wire, Donnelley can combine it with other information transmitted from the realtor. Thus, brochures with this house, or a carefully selected group of houses, are printed in small quantities and available the next day (Peppers and Rogers, 1997). The marketing implications are intriguing. A realtor could easily order multiple versions of brochures targeted to executive families with young children or executive families with teenagers, or executive families with no children. Alternatively, other market targets could be provided with brochures filled with properties that meet their needs very well.

Remarkable customizing possibilities

In a similar vein, a company called Datavision mass customizes videotapes. Instead of a computer-controlled printing press, they use a rack of CD-ROM drives to load individual video modules on each videotape. The customizing possibilities are remarkable. Consider a car company wishing to reach specific consumers, each with a specialized set of needs. The manufacturer could send out different video demos of a new model to different consumers. For families with teenagers, the video could emphasize interior seating, for sportsmen, the capacity for towing boats, for families with small children, safety. If used carefully the video might be really persuasive and reinforce what the customer is seeking. It requires information gathering and information processing to learn what each customer wants. It could be done routinely during any customer visit. A salesperson could help each customer with choices and note what each asked about. If the customer would like a videotape, and provides his name and address, a custom-produced videotape showing exact colors, and options could be sent. The video could even include a short message from the customer's own dealer and service manager or even the first "video coupon". The attractive feature is the price to the car company; Datavision can do all this today for less than $5, per piece, in the mail.

The host of examples covers multiple industries and a variety of customer needs. They provide evidence that the 1:1 concept is valid. Despite this evidence, critics charge that both one-to-one marketing and mass customization are examples of technological hype which is far beyond commercial reality. In fact, few of the examples sustain mass numbers of individualized, unique products. Most refine the market segment greatly, but miss achieving a segment of one.

Different technology requirements

Furthermore, critics charge that the two stages, marketing 1:1 relationships and mass customization have different information technology requirements. The first deals with knowing the consumer's preferences and building a relationship. The second, involves providing the mass customized product. This relies more heavily on manufacturing technology. Some claim that mass customization on the promised scale will not be possible.

In reality, information technology resources do exist which can aid both establishing a one-to-one marketing relationship and mass customization. Traditional database techniques and software can allow building of a customer database. The problems exist as those databases grow over time. Newer promising sophisticated technologies may further the potential for marketing 1:1. To assess the future of one-to-one marketing, it is necessary to review the dictates of one-to-one marketing and investigate its information technology requirements.

The rationale for one-to-one marketing

The simplicity of developing customer relations

Don Peppers, a marketing practitioner, has provided a provocative, insightful, useful, and probably even clairvoyant approach to marketing. He stresses the fundamental simplicity and ease of developing relationships with customers. In fact he cites the two most common mistakes companies make in creating one-to-one relationships with their customers as:

(1) overestimating the amount of change needed to begin the process, and then;

(2) underestimating the degree to which every facet of the enterprise needs to be involved.

Marketing 1:1 requires more than lip service or integration within the marketing group. It requires a wholehearted commitment and philosophy dedicated to knowing each consumer and treating each one as the company's complete focus.

There are four basic steps companies must go through to practice one-to-one principles.

Identify customers

Companies must know their customers. It is vital to learn which are the heavy, medium, light and non-users of your products. When companies identify consumers who will never purchase their products at all, they can stop spending money and effort trying to win them over. They simply will not purchase. More important, it is vital to learn who are the loyal customers. They represent the best prospects for company success and are the company's most valued asset. It is important for companies to take the right actions to insure they keep their business, forever.

Differentiate each customer

Treating each customer differently

Identifying the most valuable customers, recognizing their unique preferences and needs, and treating them differently is the essence of 1:1 marketing. Customers have different needs from the firm, and from each other. Moreover, they have different values to the organization. The value of a customer determines how much time and investment should be allocated to that customer, and a customer's needs represent the key to keeping and to growing that customer's business. This applies both to individual consumers and to industrial customers.

Interact with each customer

Interacting with your customers is another one-to-one marketing fundamental. Every contact with a customer represents the opportunity to learn more about his needs and his value to the organization. In some cases, direct contact will be possible and considerable thought should go into how maximum learning can take place. In some cases, direct questions will be possible. In others, consumers will make choices and the firm can infer customer preferences. Pepper and Rogers (1997) cite numerous examples of recording and using hotel guest preferences to structure future hotel interactions.

Customize products for each customer

This seems logical and apparent, but producing and delivering a product customized to an individual customer is the most difficult principle to put into practice. It is difficult. If it was not, everyone would already be doing it. The difficulty depends in part on successful completion of the previous three steps. In addition, American marketing is not geared to mass customization. Facing fierce foreign competition, many firms have adopted a drive toward efficiency resulting in higher quality but fewer choices. The higher quality may be good, but if it sacrifices a good fit with customer preferences it is a problem.

Customization creates a firm's biggest competitive advantage. It only is possible by integrating the production process with a firm's customer feedback. Once an individual has invested time and energy specifying his needs to a firm, he must first re-invent this relationship to get an equivalent product from another vendor. This creates a barrier to exit from the first firm. In addition, there is a risk that products from the next vendor might not be as satisfying as products from the first.

Information technology challenges of marketing 1:1

Increasing amount of information technology

Overall, the four steps require increasingly more information technology. The first step, identifying and classifying customers, may involve current database techniques. Building a database and classifying customers in it is not too difficult, depending on the number of customers. The task gets burdensome as the number of customers gets very large. Still, current techniques and technology will facilitate this step. In fact, high-end personal computers and off-the-shelf database software are sufficient for small- to-medium-sized databases.

The second step, to differentiate each customer, can also be accomplished with today's techniques and technology. Even a few years ago, companies were categorizing industrial customers on their volume and value of purchases. The fewer, larger, customers typical of the business-to-business market present a less severe challenge than that faced by consumer marketers. Today, many consumer companies can track customer purchases. When retail sales data come from scanned transactions, Internet interactions or even operator-entered data, it is relatively easy to manipulate them.

The third step, to interact with each customer, represents a distinct challenge. Peppers and Rogers seem to envision some kind of personal interaction at the heart of this step. It seems that the interaction is really a product or service development process that results in customization. In the traditional retail interaction, a salesperson and customer communicate face to face and possibly transact business. The sales person can listen to customer preferences, evaluate available products and services and potentially create a unique product/service offering that meets the customer's needs perfectly.

Telemarketing interaction

In the telemarketing interaction, the salesperson and customer may not see each other but they certainly can interact. However, in telemarketing, one communication mode – the visual – is absent. This tends to limit the interaction a bit and thus hinder relationship formation. Salesperson training can overcome the limitations of the telephone somewhat. However, with the increase in catalog sales and 800 number customer dial-in ordering, retailers and other organizations face a mounting challenge to interact well for customer satisfaction. The interaction step seems to become a problem in the more automated interactions presented by the Internet. In 1997, Internet transactions world wide increased to the point that telephone companies strived to buy or invest in on-line service providers. In the USA alone, Internet service providers exceeded 4,500 in 1997 (Metcalfe, 1998). Internet transactions will continue to grow as customers with Internet access reap the transactional benefits of convenience and cost savings. In an Internet transaction, the only human directly involved is the customer. The customer can access a transactional site, review products, prices, added services and delivery options without having to interact with another human. In one sense the transaction is easier for an organization. First, the customer may visit the Website from home after normal working hours and interact with a computer. The firm saves the cost of human interaction. In addition, customers supply credit card information which can be processed automatically resulting in a further cost saving. Since all the keystrokes representing customer choices and payment information are captured there are usually fewer processing errors.

In another sense, the transaction requires a significant information technology investment. Smaller organizations may not be able to afford the raw data processing and storage requirements.

The most difficult step

The fourth step, customizing products for each customer, represents the most difficult step and the most severe information technology requirement. It is no wonder that firms find it the most difficult to implement. Since it depends on integrating a firm's production process with its customer preference database, product customization will suffer if that integration cannot be achieved. One of the fundamental issues is the nature and scope of the production process. In a broad sense, production can be viewed as any process which changes the form of some material and creates some form utility. Therefore, broadly speaking, activities such as heart surgery, knitting, copying an audio CD, and assembling a Boeing 777 are all production processes. They differ greatly in terms of time, skill, degree of possible automation, and expense. One reason that heart surgery is so expensive is that it is truly a customized product. Each patient may differ on numerous variables including degree of underlying disease as well as items such as severity of the heart problem, age and even blood type. Every aspect of the operation is subject to the highly specific requirements of each patient. Automating the process is impossible and would probably lead to disaster.

In contrast, copying an audio CD can be automated to the point where humans are needed simply to load blanks into the system and to perhaps pack the finished CDs. In such a case, customization may be easy to achieve. Somewhere a computer-controlled copying machine could be programmed to add a specific series of audio tracks to one CD and a different series on the next. Reacting to customer preferences, a firm might sell custom CDs to consumer's specifications. Practically, the technology could produce a CD which starts with a lively classical cut, followed by a country and western song, rap music, rock, and some annoying non-musical noise. Depending on your taste, it all may be annoying and be valuable in keeping long distance drivers awake at night. More to the point, if a customer wants it, it can be produced without much additional cost.

Large investments in production technology

Cost is something that marketing 1:1 advocates acknowledge but do not explicate. They often claim that the 1:1 relationship reduces waste, increases satisfaction and leads to higher profits. Perhaps, but mass customization may require large investments in production technology. Technology and human inputs are often interchangeable. Faced with large volumes of production, firms often invest in technology to reduce the cost of workers. In contrast, smaller volumes usually do not justify the investment so workers are hired to do the jobs machines might do.

If the technology can be applied, and is justified by anticipated volume then firms can decide how flexible their technology should be. Using our CD example, if the incremental cost of a programmable CD recorder is small, firms might decide to buy the capability. The decision would probably be easy. On the other hand, if the capability doubles or triples the cost of the equipment, firms would need justification and a promise of investment pay-back.

In some cases, like in service industries, mass customization is relatively simple. If the laundry knows you like your shirts to have starched cuffs but unstarched collars, that is the way they provide it. Probably, there is little incremental cost to providing your specific preferences.

In the airline industry, similar economics apply. If you are a frequent flyer you may travel one airline ten or more times a month. If you always request the same onboard magazines, a vegetarian meal, and you always order coffee, the airline should know and provide it for you. Too often, flight attendants welcome you with smiles, and ask what you would like – on each of your ten or more flights.

Result in huge annual savings

Technology exists to help airlines remember what you a frequent flyer, a valuable customer, prefer. They remember your meal preferences. British Airways may instal new software, to have the ability to greet customers with their favorite magazines and personal items. The airline will be able to deliver to each flight the precise combination of materials required to serve the unique needs of each customer. BA will achieve mass customization. The airline calculates that the implementation of this new system will result in an annual savings of between $4.75-8 million by eliminating waste and reducing inventory stockpiles by coordinating deliveries from a global chain of over 300 suppliers to meet the demands of individual passengers on each flight (Foley, 1997). Moreover, profits are likely to rise as a result of this innovative method of increasing customer loyalty.

Information technology and marketing 1:1

Marketing 1:1 and mass customization require two separate types of information technological techniques. While the need to integrate production and marketing is vital, marketers should first concentrate on learning the needs of individual customers.

Building a relationship versus finding a relationship

Most of the examples Peppers and Rogers cite start with an established relationship. In those cases, the organizations already have some kind of relationship and seek to deepen it. It might be that the customer has patronized a store once, or bought a single item. In terms of a relationship there is at least familiarity. From that basis a relationship can grow. These marketers are in a real sense, engaging in a kind of incremental 1:1 marketing that is essentially inductive.

Making sense of data

Other companies may have existing customer data but have not engaged in marketing 1:1. If these firms want to start forming relationships they need to make some sense of their data. These firms face a different set of problems. They may need to find consumption patterns or some kind of geographical relationship. This task is essentially deductive and presents a set of more formidable obstacles.

Knowledge discovery in databases (KDD)

Marketing has been a long-time user of statistical and other quantitative methods applied to understanding markets. Marketing theory and practice have been in the forefront of adopting knowledge discovery techniques. We marketers are familiar with the broad area of database marketing. Database marketing is based on analyzing customer databases using techniques such as interactive querying, and predictive modeling to select existing customers more accurately. We know that magazine subscribers are more likely to re-subscribe than non-subscribers are to buy a new subscription. We may also know that male subscribers to *Gentlemen's Quarterly* are more likely to buy gourmet cookware than male subscribers to *Road and Track*.

The technique is so familiar that *Business Week* reported that over 50 percent of US retailers use database marketing with good results. For example, American Express reported a 10-15 percent increase in card use as a result of database marketing (Brachman *et al.*, 1996).

Data mining

Focus on finding patterns

Other marketing applications are more descriptive and focus on finding patterns that help marketers make better decisions. Such techniques are often called data mining and may depend on a series of interactive, structured databases called a data warehouse. With the explosion of supermarket scanner data, techniques were developed to analyze supermarket sales data. The results portrayed the most important changes in a particular product's volume and market share. The reports often broke the results down by location, product type, price level or other factor. The most important element was the clear understandable business language used to write the reports. They offer real value to marketing managers. Since the initial efforts, factors such as distribution channels, price changes, promotional levels and competitive initiatives, have been related to changes in volume, profits and share (Inmon, 1996).

Still other knowledge discovery tools have concentrated on the movement of retail stock at a point of sale. Such information can support decisions about shelf-space allocation, store layout, promotional effectiveness, product location and product turnover. Giant Food, a supermarket chain in the eastern USA used such techniques to analyze inventory turns to determine slotting allowances.

Examples of KDD

First Interstate Bancorp has started a data warehouse initiative. It found that its "data warehouse project", started four years ago, has brought substantial benefits to many of its departments. The data warehouse allows the firm to know and differentiate customers individually. Thus, the bank is better aware of its customers needs, business processes, and risks. To a great extent, marketing, finance, human resources and cash management can tailor products or programs based on attributes such as risk exposure, customer value, and profitability. The result is a better match between product benefits and customer preferences and a higher level of bank success.

A data warehouse

American Express also exploits the power of a data warehouse. Over 30 million people hold American Express cards. The company wants to treat each cardholder as a market of one. To achieve this goal, the firm has developed an innovative marketing program called CustomExtras. CustomExtras includes personalized offers and messages on the invoices of selected cardholders. Not every cardholder will get messages and those who do will get one that is customized for their profile (Foley, 1997). The American Express objective is to get more share of customer from selected customers. To accomplish this they have developed a data warehouse and used other information technology resources.

Target marketing

The technique can be used as a basis for market targeting. Target marketing is a venerable concept that sees application every day. As technology and techniques have developed, the target marketing focus has become sharper. With existing mailing list databases, marketers can target very specific audiences, like "high school librarians with budgetary control who have spent over $1,000 on materials in the last year". Such lists can be highly selective. However, mailing lists like these do not always exist in house. They are often available for rental, provided by commercial mailing list houses.

A new development makes independent knowledge discovery possible. With the spread of information technology and the skills to use data, the amount of data collected by all industries is skyrocketing (Brachman *et al.*, 1996).

Companies that have data and exploit the data mining technique may see a payoff in terms of an increased understanding of customer preferences and consumption patterns.

Problems with data mining

Data mining, a particular form of KDD, is evolving rapidly. KDD is a term describing the variety of activities and techniques for making sense of data. The term can be used to describe the overall process of turning data into information. Thus, specific activities, such as finding useful patterns in the data, preparing and processing the data as well as the traditional data mining step of running specific discovery algorithms (Fayyad *et al.*, 1996).

In fairness, the level of computer literacy among marketers has risen to a high level. The level of statistical and database management skills has also risen but not to the same degree. Just a few years ago the most commonly used managerial database was Lotus 1-2-3 which possessed modest database management characteristics. Today, dedicated databases like Microsoft Access are in more common use. Tools usually require sophisticated, trained users. They are not likely to be traditional marketers. While some tools can be used by non-database managers, the implication is that marketers will have to rely on the skills of technical experts for core KDD activities. Thus, knowledge discovery may be a two-step process involving technical expert preprocessing and marketing interpretation. This is akin to marketing research using a multi-step process to seek truth or information about a marketing problem.

However, most marketers are not skilled in its use or marketing application. Several issues inherent in the KDD process affect marketing application.

Insufficient training: Business schools teach descriptive statistical techniques and sometimes predictive modeling. Data mining also involves other techniques unfamiliar to marketing graduates.

The cashier syndrome

Data unavailability: This may be called the cashier syndrome. Cashiers often know if patrons are satisfied or dissatisfied. They do not always tell management. By analogy, for a given business problem, the data are often in various departments in a variety of formats. Also the data are often poorly organized. A central, common format can alleviate this problem.

Changing or time-oriented data: Marketing applications often involve data that change over time. Some like family life cycle related data are familiar.

At the best, these data are more complex than static data. Predicting the nature of the pattern is a significant challenge. However, the payoff may be worth the effort.

Complex data types: Images, audio, text or Internet-related data can be exceedingly complex presenting a great challenge and potentially great rewards.

Inappropriate amounts of data

Scalability: Current analytic tools cannot handle truly vast quantities of data. This is the ultimate roadblock for one-to-one marketing. In information technology terms, data warehouses of 200 Gigabytes are not uncommon. Yet the analytical tools available cannot really deal with 1 GB at a time (Brachman *et al.*, 1996). New techniques must be developed to deal with the appropriately massive amount of data required by significant one-to-one marketing relationships.

The challenges of KDD

Marketers have the notion that different customers should be treated differently to maximize the relationship with the best ones and minimize the involvement with the worst ones. Information technology is making that desire a reality. The reality comes at a cost, however. One-to-one marketing presents a new set of challenges both to marketers and information system managers. To succeed, an effective cross-functional team of information system and marketing specialists must work harmoniously. In the past the two groups barely understood or tolerated each other. On a positive note, a new breed of cross-disciplinary executives exists. They understand both marketing and technology. Overall, the most successful implementation will require true collaboration.

Key goals

To be useful to organizations, knowledge discovery tools must be accessible and useable to mainstream users. They must be understandable and useful to business managers, not just statistical experts and information system managers. To overcome potential problems in applicability, marketers must insist that several key goals be achieved. They include:

- Putting the problem in the marketer’s terms including viewing the data from a business model perspective. Often the job of knowledge discovery is performed by analysts whose primary training is in statistics and data analysis. It is likely that these analysts do not have the same perspective as marketers. To be useful to marketing, the findings must “speak the language of marketing”.
- Presenting results in a manner useful for the business problem at hand. The foremost benefit of the analysis and the job of the analyst is to help solve business problems and increase understanding. The presentation can increase or diminish the value of the analysis.
- Providing support for specific key business analyses. Marketers need to know about segmentation, market response, segment reachability. Knowledge discovery tools must support these analyses from the beginning.
- Providing support for an extensive and iterative exploratory process. Realistic knowledge discovery is not simple and not linear. It is an interactive and iterative learning process. Initial results are fed back into the process to increase accuracy. The process takes time and can have a long lifespan.

If these goals are achieved, the value of knowledge discovery should be enhanced.

Managerial implications

Analyzing the cost

The considerable promise of customer loyalty and increased customer patronage comes at a considerable cost. One-to-one marketing requires considerable information technology resources. For example, a data warehouse used for customer retention may cost from $2 to $5 million. In such cases, managers must carefully analyze the costs versus potential payoff.

The organizational implications of marketing 1:1 are far reaching. Management theorists have long called for increased integration of the firm to achieve organizational objectives. In this case, achieving a marketing 1:1 relationship requires skills and resources not usually found in the marketing department. The vital skills for identifying and exploiting data patterns, and customer preferences reside outside the department. In order to achieve one-to-one marketing, both marketing and non-marketing professionals need to collaborate effectively. Cross-functional teams are likely to be effective, if managed well. Independent managers, assigned to their departments and "working on" a marketing 1:1 project are likely to mis-communicate and fail.

Assuming a one-to-one commitment requires considerable dedication from top management. Often the task of changing procedures, reward systems and organization climate only succeed with top management support.

Staying for the long haul

One-to-one marketing and mass customization are easier to start than most managers think. The first steps are often easy and bring rewards. The real challenge is to stay for the long haul. Extensive commitment requires vast resources.

Mass customization is the most vital and most difficult step in the process. Depending on the level of technological automation required, mass customization may not be possible. In many cases, computer-aided production will be possible and will facilitate customization. In others, like the service industry, just recognizing which choices a customer would make, makes it easy to provide them routinely. However, managers must recognize the extent and limitations of their ability to produce to customer's individual demands.

Summary

One-to-one marketing is made possible by three technologies:

(1) customer databases;

(2) interactive media; and

(3) systems that support mass customization.

Using them, firms can learn more about their customers' needs, form relationships with those customers and provide them with such customized products and services that the relationships become very enduring. At the very least, marketing 1:1 will help firms be better, more successful marketers.

Not all examples cited to support marketing 1:1 achieve the extreme of one-to-one marketing. Many refine target audiences to small numbers, sometimes very small numbers. But the promise of marketing 1:1 exists and achieving it on a wide scale is much closer to reality.

Marketers must be mindful of the problems

If marketers are mindful of the technological problems that exist today, organize effectively to exploit all of the knowledge skills in the company, and manage resources appropriately, the potential of one-to-one marketing may be achieved. Until that happens, one-to-one marketing will play its alluring siren song but not deliver all that it promises.

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