FROM ONE-TO-ONE MARKETING TO CONTINUOUS MARKETING
Issues and Implications

WENYU DOU
St. Cloud State University

SANJOY GHOSE
University of Wisconsin-Milwaukee

There is growing recognition that a market may actually be better represented if it is divided into a very large number of segments whose nature may change over time. In this paper we advance a framework for "continuous marketing" (CM) that recognizes the importance of the above issues. CM ensures that every subtle change in a customer's needs and profile will be reflected in a real-time change in the marketer's offer to the customer. CM is especially suitable for implementation in the new Internet economy where online vendors interface with a potentially large worldwide audience. The implementation of CM is heavily technology based and relies on a marketing decision support system. We outline strategies for implementation of CM in the real world, and its implications for marketing academics and practitioners.

INTRODUCTION

Marketers in the 21st century face tremendous challenges as the fast-growing e-commerce accelerates the already intense global economic competition. With the traditional market extended to the virtual cyberspace, geographic boundaries to competition have shrunk and industry competition has increased in the web as both pure Internet (e.g., Amazon) and traditional players (e.g., Barnes & Noble) have joined the cyber race. Attracting online customers to a firm is getting harder with the large numbers of merchants competing for business. High costs of getting new customers, keeping current customers, and maintaining customer loyalty (Baldock, 1999) are just some of the difficult issues that online vendors are struggling with.

The intense competition in the increasingly global and virtual economy suggests that simply adopting a marketing orientation (Narver

---

* Wenyu Dou, Department of Marketing, G.R. Herberger College of Business, St. Cloud State University, 720 4th Ave. South, St. Cloud, MN 56301, (320) 255-3424, wdou@stcloudstate.edu
and Slater, 1990; Kohli et al, 1993) and focusing on meeting customer needs, may not be enough. Rather, companies have to realign their relationships with consumers over time and thus continually meet their needs over time (Kahn, 1998). No longer is it sufficient to craft successful marketing strategies just around the “4Ps” of traditional marketing. Today, issues like “customer relationship management” and “customer lifetime value” are making business headlines (Hamm and Hof, 2000; Field, 2000; Schonfeld, 2000). In response to the rapid-changing business environment, marketers have been revising the traditional exchange-based marketing paradigm with new thinking such as relationship marketing (Weitz and Baardford, 1999; Gummerson, 1998; Parvatiyar and Sheth, 2000), one-to-one marketing (Peppers and Rogers, 1993), personalized marketing (Hanson, 2000), and real time marketing (Oliver et al, 1998). While those diverse perspectives may differ in exact definitions of the terminology or the scope of conceptual domain, they share a central theme in that the fundamental goal of marketing in the future should be to build a long-term relationship with each individual consumer over time. Doing so will satisfy the consumer's need better and more efficiently.

For the past two decades, “Market Segmentation” has been the cornerstone concept of contemporary marketing thinking for the needs of customers from a “homogeneous” segment (Dickson and Ginter, 1987; Schultz, 2000). However, the increasing heterogeneity of modern consumers (Kotler, 2000) means that strategic marketing plans that are based on only a number of “consumer segments” will be increasingly inadequate to meet the exact needs of each individual customer in a segment. For instance, Allenby et al. (1998) provided empirical evidence that the homogeneous segment assumption might not be reasonable and a better representation of the market would be to consider many more segments, perhaps a hundred or more.

As prominent pioneers of the “1-to-1 marketing” tenet, Peppers and Rodgers (1993) argue that the “segmentation” concept should be pushed to its limiting sense, i.e., each customer should be treated as a unique segment. Consequently, they propose that marketing programs should be designed to meet each individual customer’s need, one at a time. They point out that “1-to-1” marketing is now possible at low cost due to the rapid development in information technology and the availability of scalable data warehouses and data-mining products. As powerful information technology is applied to cultivate one-to-one relationships with customers, it is now possible to build a profitable long-term customer retention and growth strategy. The “1-to-1” marketing camp has enjoyed a loyal following in some sectors of the industry as more than 1,000 companies have started their 1-to-1 initiatives (see examples given at www.1to1.com).

In response to top level executives’ criticisms about the effectiveness of marketing (Sullivan, 1991), Relationship Marketing (hereafter RM) that emphasizes establishing, developing, and maintaining cooperative, long-term relationships, has emerged as a new marketing paradigm (Parvatiyar and Sheth, 1994). RM, according to Sheth and Parvatiyar (2000), is defined as the ongoing process of engaging in cooperative and collaborative activities and programs with immediate and end-user customers to create or enhance mutual economic value at reduced cost. In the RM paradigm, “1-to-1” marketing is positioned as an “individual marketing” program that is tailored for an individual consumer. In their conceptual framework (Parvatiyar and Sheth, 2000), RM is treated as a process of engaging in a cooperative and collaborative relationship so as to improve relationship performance (e.g., financial, operational) for both parties. They argue that RM can bring significant benefits to consumers as well as marketers. For instance, consumers will be able to get the exact marketing offerings that fit their needs and marketers will be able to reduce the waste in marketing expenses and increase marketing efficiency. They further maintain that
society welfare will be enhanced through RM practices as well.

During the past few years, the continuing growth of e-commerce activities on the Internet has significantly spurred "1-to-1" marketing practices on the web at real time, as web merchants battle to establish competitive advantage through the applications of advanced "personalization tools" on their web operations (Hanson, 2000). Such a trend has been further facilitated by the proliferation of web-based "profiling" software applications (Oh, 2000) such as BroadVision and Engage Technologies. These advanced technology tools, when successfully implemented, have the potential to capture customer movement in real-time and help marketers produce highly relevant offers (e.g., products, services, content) that respond to the needs of individual web site visitors in real time. At present, primarily big Internet merchants or major online service organizations such as travel and insurance web sites have used such applications. Nevertheless, the popularity of such applications is likely to be more widespread in the future. At this stage, there are at least 20 software vendors that are engaged in developing such real-time personalization applications (Oh, 2000).

Compared to "1-to-1 marketing" as originally defined by Peppers and Rogers (1993), "1-to-1 marketing in real time" by online merchants represents significant progress as the critical time dimension has been highlighted and closely integrated into the marketer's decision plans. Oliver et al. (1998) posit that in real-time marketing, the product is not only mass customized for the customer, but has the ability to evolve over time in reaction to changing consumer needs. The trend of accelerating the pace of "1-to-1" marketing is plausible in that it recognizes that each individual consumer's need may change over time and the marketer should be ready to present the most relevant offering at different times. For instance, a travel web site that only adopts "1-to-1" marketing, may be able to offer a customized tour package (e.g., Disney Theme Parks) based on the stated preference (e.g., prefer family activities) of a registered web user. On the other hand, a travel web site that pursues "1-to-1 marketing in real time" may be able to offer different banner ad copies or promotional programs as the user browses different sections of the web site even if such movements do not coincide with the stated preference (e.g., because of the user's variety seeking behaviors). Thus, if the user clicks on Hawaii travel information, the site can display a banner showing promotional fares on Hawaii travels. By doing this, the web site would be able to constantly adjust marketing offerings to the user based on the user's displayed interests in real time.

Despite the interests shown by the businesses for "real time" marketing, the current state-of-the-art implementation of 1-to-1 marketing is not really "real time" yet, as technological constraints and marketers' ignorance have prevented them from taking the quality and efficiency of 1-to-1 marketing to a higher level. In this paper, we posit that marketers in the future should bring "1-to-1 marketing" to a limiting level such that the marketer is indeed responding to the customer's needs in real time. This will ensure that every subtle change in a customer's needs and profile will be reflected in the subtle change of the corresponding marketing offer (e.g., product, promotion, service) to the customer. The unprecedented level of marketer responsiveness stipulates that future marketers react to each individual customer "live" with every infinitesimal change in the overall consumer profile. Henceforth, we define the practice of "1-to-1 marketing in the limiting case" as Continuous Marketing (hereafter CM).

In our conceptualization, "Continuous Marketing" (or CM) goes beyond the simple personalization commonly practiced for a certain time period. It has three major components:

1. continuous monitoring of customer needs;
2. continuous updating and evaluation of customer profiles; and
3. continuous adjustment of the merchant's total market offering to meet the evolving needs of consumers.

In order to deliver total marketing offers that may be continuously changing, CM also calls for the continuous collaboration with the marketer’s business partners (e.g., suppliers, distributors). Obviously, the demanding nature of CM stipulates that it is essentially a heavily technological-dependent marketing practice. Thus, it has to be built on comprehensive databases about consumers and be implemented through marketing decision support systems. If properly executed, we believe that CM has the potential to change how marketing is done in the future digital economy and in the process enhance consumer welfare.

The rest of this article is organized as follows. In the next section, we present an integrated framework for CM. In section III, we examine the benefits and limitations of CM to consumers, marketers, and society. Then in section IV, we outline strategies for the successful implementation of CM in the real world. Finally, in section V, we discuss the implications of CM for marketing academics and practitioners in this e-commerce world.

**A CONCEPTUAL MODEL OF CONTINUOUS MARKETING**

In this section, we present an integrated framework for Continuous Marketing. Specifically, we examine the following components of CM:

1. the positioning of CM with regard to other marketing paradigms;
2. consumer state vectors;
3. market offer vectors; and
4. how to connect consumer state vectors to market offer vectors.

**Positioning of CM**

Figure 1 illustrates the evolution of CM and its relative positioning to previous marketing paradigms. Traditional marketing (even with the segmentation technique applied) emphasizes exchanges between merchants and consumers. Relationship Marketing emerged in the 90s and shifted the emphasis to building long-term relationship with customers. One-to-one marketing can be considered as a subset of the RM paradigm that focuses on building relationship with each individual customer, one at a time.

With the advent of e-commerce, the practice of one-to-one marketing has been further advanced by some online merchants to deliver a unique market offer to each customer based on his/her exhibited online behaviors (e.g., click-through paths, search patterns) using personalization tools (Hanson, 2000). However, this practice is “real-time” only in the sense that the marketer will respond to changes in online behaviors at discrete time intervals but not continuously. For instance, in a web site targeting outdoor-activity lovers using 1-to-1 techniques, a customer who clicks through levels of pages to the “kayaking” page will be shown a banner by “Whitewater Kayaking Resort”. However, the intermediate steps or click throughs will largely be ignored by the marketer. In comparison, the same web site, following CM principles, can dynamically alter the content of the next page to be displayed based on the previous link clicked by the visitor. Otherwise the web site may miss the opportunity to dynamically alter the market offer. For instance, if the visitor has exhibited search patterns similar to a novice’s, e.g., clicking “What is Kayaking” page in the section. Then the banner for “Whitewater Kayaking Resort” can be modified to “Whitewater Kayaking Resort; 50 percent off for beginner's classes”. This simple example illustrates that a CM approach can be implemented to deliver unique and dynamically altered comprehensive marketing offers to individual customers.

In summary, CM is a limiting case of “real time 1-to-1 marketing” that highlights the critical importance of market responsiveness of marketers.
**Consumer State Vector**

Database marketing has long been regarded as an important technological tool by relationship marketers and 1-to-1 marketers (Sidodia and Wolfe, 2000). The foundation of successful database marketing lies in the compiling of comprehensive consumer information. While the practice of gathering consumer data has been adopted by a number of traditional industries (e.g., scanner data used by grocery stores and supermarket stores), attempts to merge consumer offline information and their online behaviors have been criticized by consumer privacy advocates. For instance, the online advertising company Doubleclick was under heavy public fire (Thibodeau, 2000) for trying to merge anonymous online user behaviors with personal information obtained in the brick-and-mortar world. Even with merged databases from multiple information sources, records about consumers are often incomplete and limited, leaving much of the offer market planning to the guesswork of marketers.

We propose here an alternative option for marketers to formally construct comprehensive databases about consumers using the Consumer State Vector approach. A Consumer State Vector (CSV) is a data vector that not only measures a customer’s overall profile at
time t but also encompasses meaningful observations about the consumer up to t. As defined, a CSV for any consumer may change as time goes by (e.g., aging, lifestyle change, living place change, etc.) Following a similar argument put forward by Hagel and Singer (1999), we posit that the four major components of a CSV are as follows:

1. Exhibited online behaviors: such as clickstreams, search sequences, keywords used, online orders, e-mail correspondences, forms completed, etc.

2. Offline behaviors: such as past purchase history, frequently bought goods, brand preferences, type of promotions participated, etc.

3. Descriptive characteristics: such as demographics, credit card debt outstanding, investments, and psychological traits (Hagel and Singer, 1999). Such parameters may not change often but may undergo a big change at times. Insurance companies, such as USAA, already follow the life-changing patterns of their customers (e.g., marriage, child born, etc.), and provide recommendations to accommodate their changing needs. Burke (1997) also suggested that retailers use database systems to track major life events of consumers (e.g., births, deaths, marriage, graduations, and moves). However, even for companies that plan to actively track major life events of their customers, minor signs of changes prior to the dramatic change are often hard to detect if they do not follow customers on a continuous basis.

4. Direct purchase intention and preference: This is probably the most difficult category for marketers to figure out without actually asking the consumers. However, because of this category's importance in shaping the marketer's decisions, we concur with Hagel and Singer (1999) and propose that consumers should be rewarded for revealing such information to an independent intermediary that can release such information to selective merchants who agree to provide better deals as incentives for consumers. By doing this, the consumer will have control over the neutral intermediary on what information and how much to release to which merchant. In addition, the participating merchant benefits by getting access to valuable purchase-related information without risking the dangers of privacy transgressions.

Of course, some parameters in the CSV may change more frequently than others. Potential change of patterns can be described in the following table (Table 1), which postulates that changes in CSV will be most pronounced when the consumer is undergoing major changes in life events and is actively involved in purchasing a product. Table 1 discusses possible patterns of changes in CSV with regard to changes in two dimensions: consumer personal characteristics and whether the consumer is near a purchasing decision.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible Types of Variations in the Consumer State Vector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No significant changes in personal characteristics</th>
<th>Non-purchasing period</th>
<th>Pre-, in- and post-purchasing period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant changes in personal characteristics (e.g., marriage)</td>
<td>Nearly constant CSV</td>
<td>Changes in behavior parameters Moderate change in CSV</td>
</tr>
<tr>
<td>Changes in personal parameters Moderate change in CSV</td>
<td></td>
<td>Significant changes in CSV</td>
</tr>
</tbody>
</table>
We postulate that changes in CSV will be prominent when the consumer is near a purchase decision and there is a significant change in consumer personal characteristics. On the other hand, if the consumer does not have a purchase decision in mind and there is no major change in consumer personal characteristics, then changes in CSV are likely to be small. The implication here for CM marketers is that they would watch for conditions where CSV may undergo major changes and be more alert under those conditions.

**Market Offer Vector (MOV)**

The interactive digital economy stipulates that marketers must strive to provide differentiated offerings to potentially heterogeneous consumers (Oliver et al, 1998). With the advancement of technology such as flexible manufacturing and online personalization tools, marketers who have a clear understanding of CSVs would be able to personalize various components of their market offers in real time. In this paper, we propose a new construct called Market Offer Vector (MOV) that encompasses the totality of a firm’s market offering to a customer. A MOV at time t is a single market offer with a variety of attributes that can be uniquely fit into the consumer’s profile at time t. We posit that there are four major types of attributes in a MOV:

1. **Product attributes:** The online merchant will offer the just right mix of product attributes based on the deduced (e.g., from search patterns) and revealed purchase intentions. For instance, if the visitor has indicated he/she intends to buy a bargain PC in his/her informa-

2. **Advertising/promotion:** To induce the visitor to complete the above purchase, the merchant can highlight a free ship-

3. **Service:** If the user has been documented as a novice computer user in his/her CSV up to this point (e.g., through the type of computer support questions asked previously), then the merchant can propose to offer extended tech support to the potential buyer.

4. **Transaction terms:** If the user has been documented as credit tight at the point of purchase, an offer of “no interest no payment for 6 months” might significantly facilitate the buying process.

While the notion of customizing product components has been advocated previously in the literature (Oliver et al, 1998), the MOV is unique in that it treats a market offer as the totality of various marketing mix elements and value-added pre-purchase decision aids and post-purchase services.

**Linking the Consumer State Vector (CSV) to the Market Offer Vector (MOV)**

The essence of CM is to closely link MOV at time t to the CSV at time t. In accordance to the marketing decision support system literature (e.g., Duan and Burrell, 1995), the link of CSV to a corresponding MOV should be based on decision rules provided by established marketing models. As in any marketing decision support system, marketing decision rules need to be developed by experts, tested and refined over time. Once the pertinent marketing decision support system is in place, the marketer will present a MOV to respond to the specific CSV based on the preset decision rules.

We formalize the above process as follows. Define any customer i’s Customer State Vector at time t as

\[ C_i(t) = (\text{demographics, psychographic, search_behavior, purchase_history, clickthrough_path, ...}) \]
where the central parameter group $\Delta$ refers to a group of parameters that are inherent with this specific customer, such as demographic profile, psychographics, personality traits, etc. The behavior group $\Omega$ includes parameters that can be influenced by external marketing stimuli such as search behaviors, click-through paths, past purchases. These groups of parameters may not change much during the "non-purchasing" period but could alter significantly in the near purchasing period.

We also define online merchant offering vector at time $t$ to consumer $i$ as

$$\vec{M}_i(t) \text{(product specification, offer terms, services, advertisement, POP display, ...)}$$

A MOV can be considered as a multi-variable function of the CSV with the functional form specified by the pre-set marketing decision rules. If a MOV has to be able to respond to changes in consumer state vector on a continuous basis, the multivariate function should be continuous in a mathematical sense. That is, for any infinitesimal change $\varepsilon$ in consumer $i$'s state vector $\vec{C}_i$ at time interval $\delta t$, the online merchant will change its offering vector to $\vec{M}_i(t+\delta t)$ such that

$$|\vec{M}_i(t+\delta t) - \vec{M}_i(t)| < \delta$$
where \( \delta \) is an infinitesimal number. The linking of MOV to CSV is also depicted in Figure 2. A flow chart that describes the major sequence of events in a typical CM session is in Figure 3.

![Flow chart diagram]

Obviously, the complexities of continuously linking the consumer state vector to the market offer vector is unimaginable without the support of powerful marketing decision support systems. As Sisodia and Wolfe (2000)
pointed out, with virtually unlimited power of IT systems to store, retain, and process data describing real consumers on an individual basis, information technology can boost marketers’ intuitive insights and creativity into higher orders of effectiveness. As a result, precision and responsiveness of marketing will be elevated to an unprecedented level at an affordable cost. The ultimate outcome from this incoming revolution in marketing will be that marketers will be able to continuously monitor consumers’ needs and states overtime and provide the most relevant offerings at every time point.

**EXPLORING THE DOMAIN OF CM**

In this section, we closely investigate various aspects of the proposed CM paradigm. Specifically, we look at the following issues: (1) promises of CM, (2) critical assumptions for CM, and (3) challenges facing CM marketers.

### Promises of CM

As CM grows out of the Relationship Marketing and 1-to-1 marketing domains, it is expected to bring the same types of benefits associated with the implementation of RM principles. Sheth and Parvatiyar (2000) listed the following potential benefits of RM in improving marketing productivity:

1. Achieving marketing effectiveness: Consumer needs are better addressed and consumer involvement in the marketing process makes them more committed to the company. In the CM setting, continuous monitoring of consumer needs and constant updates of their profiles make it possible to meet customers’ needs seamlessly, thus making consumers happy.
2. Individual marketing: RM principles require the marketer to anticipate and recognize different consumer values and allocate marketing resources accordingly. In a similar vein, CM principles call for the marketer to elevate the quality of individualized marketing to the highest possible level.
3. Achieving marketing efficiency: The successful implementation of RM can make resources more productive and reduce wastes in marketing costs. Likewise, by presenting a total marketing offer that exactly matches a customer’s needs at any time, a CM marketer is much more likely to sell the product very quickly thus reducing inventory and marketing cost. Hanson (2000) further points out that “personalization” of marketing can bring the following four types of benefits, all of which can also be achieved through CM:
   i. Simplification of choice: When customers need’s for the product are relatively uniform and the product is complex and quality hard to judge (e.g., health care service providers), a simple endorsement by the website such as “Top 5 Health Care Providers in Michigan with High Customer Satisfaction” might suffice.
   ii. Educated word-of-mouth: When customers need’s for the product are highly differentiated and the product is complex and quality hard to judge (e.g., music CDs), the merchant can use “collaborative filtering” techniques (Hanson, 2000). This will help in providing product recommendations to a new buyer based on the purchases made by existing buyers who may share the same preferences with the new buyer.
   iii. Interaction management: When customers’ need’s for the product are relatively uniform and the product attributes are quantitative (e.g., consumers looking for bargain-priced PCs), the merchant’s task is to provide the most relevant offer to each consumer who may have a unique
set of product specification requirements (e.g., in hard drive size, processor speed, RAM size).

iv. Display utility function for each user: When customers' needs for the product are highly differentiated and the product attributes are quantitative (e.g., selecting a mountain bike), the merchant can use Computer-Assisted Self-Explication (Hanson, 2000) to supply the best model match based on the user-inputted preferences (e.g., relative weights of style and price placed by the mountain bike buyer).

Besides the above-discussed benefits that CM shares with RM and 1-to-1 marketing, we argue that CM is expected to produce the following additional benefits:

**Universalize Customer Profile Tracking**

Marketing activities by a firm have generally been fragmented in the past. Salespeople's records of potential customers' responses may not be correlated to other relevant marketing information such as customer inquiries to the call center, website search patterns, past purchase records, repair history, credit ratings, satisfaction survey results, or changes in customer personal characteristics as recorded in "informediaries". In fact, each department in a company or each unit in the marketing department may be holding a different set of information about the same individual consumer that are difficult to reconcile into a comprehensive database. Attempts by a firm to put together all types of relevant information about each individual consumer have been uncommon. Further, much of the sensitive purchase intention or preference information is difficult to get without the input from an informediary that may hold such information. In comparison, in the proposed CM paradigm, the marketer shall integrate a broad range of information about each individual consumer (including sensitive information obtained through consumer-designated informediaries) into a unique data vector of consumer profile that varies with time. As a result, if a consumer profile can be constantly built up through comprehensive information sources, then the customer can be easily identified at the firm's marketing radar screen and receive a highly differentiated treatment.

**Integrate Total Marketing Offer**

Traditional marketing organizations operate around different marketing functions, e.g., sales, advertising, promotions, financing, customer support, online sales, distribution etc. When a customer engages in a transaction with the organization, he/she generally will have to deal with different units that may not always share the same goal. As a result, the customer may not necessarily get the best overall offer. In comparison, in the CM framework, different
marketing units will closely collaborate so as to present the most relevant marketing offer package to the individual consumer. For instance, the CM marketer will deliver an advertising message tailored to the specific user at the specific time, a promotional offer tailored to the specific need of the user at the specific time, financing terms that fit well with the user's financial picture, an extended support arrangement that caters to the maintenance needs of the specific user, and a distribution method that fits the user exactly at that point in time. Overall, a Marketing Offering Vector approach following CM principles underlines the importance of integrating different components of the marketing offer thus producing a coherent value-maximizing package for the customer.

**Build-in Market Learning Mechanism**

The CM paradigm also embodies self-learning mechanisms in the marketing process. This is true because at least some of the parameters in the Customer State Vector will be updated following new observations. As a result, the CSV at time $t$ should have assimilated all information up to $t$. For instance, past purchase habits and credit can be incorporated into the current CSV at time $t$. This approach ensures that the merchant is not nearsighted to what's happening right now but sensitive to the revealed past user patterns. In a similar vein, the production of the Marketing Offer Vector, guided by the marketing decision system, also embodies an inherent learning process. For instance, if a Marketing Offer Vector at time $t$ has been documented to be rejected by the same consumer previously, then the marketer should consider modifying the offer vector or revising the underlying decision support system rules. The continuous self-learning propensity of the CM system stipulates that the marketer build marketing intelligence based on accumulated knowledge and insight about consumers. This unique feature really separates CM from “1-to-1 marketing at real time.”

![Diagram](image-url)

**Figure 4**

CM, the Ultimate Quality Benchmark for Marketing
The following simple example illustrates why CM may be preferable to “real time 1-to-1 marketing”. Suppose that consumer A, who does not want to pay more than $1000, is looking for a model with 8MB-video memory. An online merchant that implements “1-to-1 in real time” is able to identify this need but cannot sell at $1000 at the customer’s first visit (assume that the model costs $1100). When the customer goes to the vendor site the second time and still conducts product search using the $1000 criterion, the merchant tries to sell the customer a $1000 model with only 4MB memory—and the customer rejects the offer. Another online merchant, that follows CM principles, approaches the same customer differently. Once it identifies the critical attribute of video memory size in the first encounter, it delves deeply into the consumer’s profile and learns that the consumer has just purchased a digital camcorder and probably will soon have the need to edit digital videos. The vendor immediately assembles a convincing e-mail promotional package to the customer highlighting the importance of bigger video RAM sizes for processing videos (e.g., expert recommendations). The offer also promises to bundle a video editing shareware with the purchase of a PC with 8MB video RAM. The customer, now focuses more on the performance rather than price, gets what he wants and the CM vendor is happy to get the sale. Clearly, the ability to follow customers’ overall profile changes gives CM a clear edge in satisfying customers’ needs faster and more profitably.

**Key assumptions of CM**

The presentation of CM above suggests that CM may require a significant amount of effort from the marketer’s side. Thus, just like RM (Sisodia and Wolfe, 2000) and personalized marketing (Hanson, 2000), it may not work well for every company. For instance, it may be more appropriate in industries in which repeat business is common (e.g., credit card companies, grocery stores, online book stores, etc.). Further, for this major undertaking to work, we postulate that the following set of assumptions has to be met:

1. The marketer has the capability to collect abundant and comprehensive information about consumer needs and profiles on a continuing basis. While currently information technology may be available to achieve this goal on a smaller scale, large-scale systems that are cost-efficient are probably not in place yet (Li et al, 2001).

2. The willingness of consumers to share sensitive information with trusted merchants or entrust such information to informediaries. Hagel and Singer (1999) have called for society’s attention on setting up consumer-controlled informediaries that work with merchants to make the buying process more efficient. However, fully functional informediaries in the strict sense are still to emerge.

3. The marketer should be able to develop or have access to accurate marketing decision support systems that can simultaneously interpret consumers’ change of state in real time and provide clear instructions to the marketer to change the MOV based on the changes in CSV.

4. The marketer should have abundant market offering inventories such as different types of advertising copies, different types of service plans, payment options, promotional programs, POP displays, and web pages. The bountiful inventory offerings (e.g., through different combinations of offer components) increase the likelihood that the MOV that corresponds to each consumer’s unique CSV can be quickly retrieved from a vast inventory of marketing offers and presented to the individual at any point of contact. Further, a flexible manufacturing system with the help of adaptive technologies...
(Oliver et al, 1998) may be necessary so that the manufacturer can provide truly customized products at short notices.

**Challenges for CM Marketers**

While we argue that CM has the promise to become a mainstream marketing paradigm in the foreseeable future, there are several challenges CM marketers must address before they apply the CM principles successfully. These are:

1. **Privacy:** The recent public outcry about the pervasive data collection practices by Doubleclick has raised the question of whether consumers are willing to allow marketers get "up-close-and-personal" with them in terms of collecting a large amount of personal data. We believe that independent informediaries that release important information to trusted merchants as proposed by Hagel and Singer (1999) might prove to be a sensible solution to the privacy concern. However, businesses and consumer rights advocates have to work closely together to put together prototypes and binding ethical guidelines. Once companies behave properly in their data collection practices, consumer will feel more confident about the trial and adoption of informediaries.

2. **Cost:** The CM paradigm requires the firm to invest heavily in data acquisition, management, and mining; both in terms of technology and personnel. Thus, as pointed out by Hanson (2000), the expense of having such systems could easily go beyond the reach of smaller companies. For instance, Broadvision, an online personalization software, costs about $200,000. Nevertheless, we envision that the problem may be lessened if smaller companies can pool together their financial resources and possibly share CM capabilities through technological partnerships.

3. **Availability of Quality Marketing Decision Support Systems:** A critical step in the implementation of CM paradigm is the linking of CSV to MOV, based on decision rules prescribed by an underlying marketing decision support system. Thus, for the linkage to work correctly, the marketing decision support system must be able to supply sensible rules that can correctly interpret CSVs. Even though marketing researchers have been working on generalizable marketing laws and rules for the past several decades, the accumulated knowledge is far from complete. As a consequence, marketing decision support systems based on inadequate rule sets, may prescribe incorrect marketing decisions. Nonetheless, we envision that the continuous development of marketing models and the maturing of the field of marketing may alleviate the problem in the future.

4. **Organizational challenges:** One of the challenges facing firms that try to implement CM practices may come from the organization itself. This is true because, in the CM paradigm, marketing functions must be closely integrated with other organizational functions in order for the marketing department to respond to consumers' needs in real time. For example, a shortage of certain raw materials in the production plant may imply that the marketer might have to present a modified offer that takes into account the impact of such shortage on the available product choices for consumers. The marketer may have to persuade the customer to buy a different model but provide the customer better payment terms as an incentive. Offering better payment terms to consumers may need the immediate approval from the company’s finance department. Thus, any
miscommunication between different units in a company may render a CM effort less valuable to the user.

Further, the CM paradigm coincides with the shift of an organization's strategic focus from corporate or competition-oriented strategy to a strategy that puts utmost importance on the customer. As the transition in the orientation of marketing strategy may conflict with the traditional ways a firm's functional units normally operate (e.g., the engineering-oriented R&D department), it is expected that the process could be painful and meet with considerable resistance. Thus, a highly consumer-oriented strategy in accordance with the CM paradigm may be slow to gain organizational wide support. However, just like any other radical organizational changes, proper support and reward mechanisms may make the transition process smoother and easier (Schermerhorn et al., 1997). Most importantly, top management must make it clear that failure to enhance the quality of marketing through CM programs ultimately will result in the loss of customer loyalty or patronage—the biggest asset for firms in the digital economy.

**DELIVERING CM**

In this section, we highlight some of the critical issues associated with the successful implementation of the CM paradigm for marketing organizations in the 21st century. In particular, we examine the technical feasibility of implementing CM, how marketing professionals should adapt to the changes of CM, and implications of CM for marketing educators.

**Technical Foundations of CM**

Even though the pictures we painted before about CM might sound exotic, the reality is that most of the underlying technologies for CM are available and some of them have already been used by leading Internet vendors. On the data storage and processing side, high capacity data storage has become increasingly affordable (Moore, 1999). On the communication side, high-speed data communication and transmission technologies are rapidly improving (Ray, 1999). Most significantly, prototypes of "real time personalization" tools with partial CM capabilities have already been fully tested on the Internet and those application providers are racing to develop better products everyday.

Table 2 lists some representative "real time personalization" software providers and the key features of their products. While it shows that quite a number of companies have developed software applications that are similar to the applications prescribed by the CM paradigm, it should be noted that none of the software is able to fulfill the CM promises as yet. Most of them are designed to customize one or two components of the total marketing offers (e.g., advertising copies, content) and they usually rely heavily on online information but less so on offline information. Nonetheless, we envision that rapid developments in information technology and computing power will soon fill in the gap between technological capabilities and CM requirements.

**CM Challenges to Marketing Professionals**

As the CM paradigm relies heavily on computer information systems to collect information and implement marketing decisions, the firm's reliance on the manual labor of marketing professionals is likely to be reduced in the future. For instance, automated data collection system is likely to take a chunk of the marketing research department's job away. Similarly, promotional decisions prescribed by expert decision systems are likely to reduce the need for lower level promotional managers. Also, marketing offers that suit consumers' needs more precisely are expected to lessen the need for customer support personnel who provide post-sales support or services.

The CM scenario above also implies that the "downsized" marketing professionals within a firm may move into two opposing


<table>
<thead>
<tr>
<th>Company</th>
<th>Representative CM Products</th>
<th>Data Sources</th>
<th>Object of Personalization</th>
<th>Major Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Technology Group (ATG)</td>
<td>Dynamo</td>
<td>Marketing databases and online behaviors</td>
<td>Content</td>
<td>Dynamically adjust every element of content seen by an end user</td>
</tr>
<tr>
<td>BroadVision</td>
<td>One-to-One Retail Commerce</td>
<td>Consumer account information and past records</td>
<td>Online shopping experience</td>
<td>Effectively managing complex online consumer interactions, Content</td>
</tr>
<tr>
<td>eHNC</td>
<td>EFalcon</td>
<td>Real time credit transaction data pooled from online vendors</td>
<td>Shopper credit card risk assessment</td>
<td>Dynamically evaluate the risk/fraud factor of each</td>
</tr>
<tr>
<td>Engage Technologies</td>
<td>Flycast, AudienceNet, AdKnowledge, Adsmart</td>
<td>Consumer preference-Users' browsing habits, Anonymous profiles of online consumer behaviors, Purchase records, Registrations</td>
<td>Advertisement, Commerce offers, Content</td>
<td>Pooling together consumer information from thousands of participating sites to help marketers reach those very specific audiences</td>
</tr>
<tr>
<td>MatchLogic</td>
<td>CalibrateE, TrueSelect</td>
<td>Opt-in customers, Registration, Cookies</td>
<td>Advertisemente-mail messages/offers</td>
<td>Present the right message or offer to the right online audience</td>
</tr>
<tr>
<td>NetPerceptions</td>
<td>E-commerce solution, Call centers, Adtargeting</td>
<td>Customer queries, Browsing habits</td>
<td>Product offers, Call center cross-sell, Ad content</td>
<td>Make the right suggestion to the right buyer at the right time</td>
</tr>
<tr>
<td>Personify</td>
<td>Personify, Proactive Network</td>
<td>100 millions anonymous profiles of online shoppers, Offline databaseRegistrations</td>
<td>Content, Ad e-mails</td>
<td>Full range online behavior monitoring, Targeted offers</td>
</tr>
</tbody>
</table>

Directions. One side is the “expert” group consisting of marketers that are highly proficient in understanding the needs and behaviors of target consumers. They should, with the help of IT professionals, take up the design duty for the marketing decision support system underlying the CM engine. Alternatively, they should be in charge of adapting outsourced decision support software to the specifics of the firm’s target consumer group. The other “pole” may consist of marketers whose primary responsibilities are to ensure the proper working of the gigantic CM system or to fill up any voids that may be left by the CM system. For instance, this group of marketing professionals might be called upon when certain components of the CM system malfunction or when it is not economically feasible to capture the profile of certain consumers at certain times through machine-only observations (e.g., they could then serve as human interviewers to elicit more in-depth consumer responses). In fact, their roles may be closer to those of the traditional technical support so
that we would label them as "marketing support personnel".

In summary, we foresee that for future marketing organizations that adopt the CM paradigm, mediocre marketing professionals with no special skills will become obsolete. On the contrary, marketing professionals who have a firm understanding about consumers will emerge as "CM system designers" and those who have technical expertise as well as marketing-savvy will become "CM system support staff".

**CM Challenges for Marketing Educators**

The preceding analysis about the likely career paths of future marketing professionals in the CM paradigm signals that marketing educators have to respond to such challenges and renovate the curriculum and philosophy of traditional marketing programs.

Future marketing programs are likely to be more technology-centered; so the technical requirements of marketing students are expected to include computer-related skills necessary for handling CM information systems. At the undergraduate level, marketing graduates are likely to become "CM system support staff"; so they need to be exposed to the important components of the CM system as part of their curriculum.

The critical importance of expert or artificial intelligence-based marketing decision support systems may mean that firms will increasingly put a premium on the expertise of advanced level marketing researchers. Thus, we foresee that masters level or even doctoral level marketing graduates—who have the ability to generate the marketing knowledge for marketing decision support systems—may gain the same type prominence enjoyed by today's web site masters. Consequently, demand for marketing professionals who can discover and disseminate consumer knowledge will grow even stronger.

**REFERENCES**


