

U-Commerce: Expanding the Universe of Marketing

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This article introduces several new concepts that lay the conceptual foundation for thinking about next-generation marketing based on ubiquitous networks. U-commerce, or Über-commerce, is predicated on the characteristics of network ubiquity, universality, uniqueness, and unison. It is proposed that the keys to managing network-driven firms are the concepts of u-space and attention analysis. The implications for next-generation marketing in the u-space are explored, with a research agenda identified for scholars and managerial implications recognized for practitioners.

The changing nature of commerce is a transformation in progress that has many parallels with the early twentieth-century revolutions in physics and art (Shlain 1991). Physics was content with Newtonian mechanics until Einstein perturbed this equilibrium with the theory of special relativity. He asserted that traveling at speeds close to that of light distorts the shape of ordinary objects. Thus, space interacts with the volume, shape, and size of objects, an effect that is seen only at relativistic speeds. Similarly,

artists had for centuries exploited their understanding of perspective to realistically capture an instance in three-dimensional space (see Figure 1 for an example). Picasso, Duchamp, and Matisse, among others, collapsed space (see Figure 2 for an example) with their provocative modern art. Cubism, perhaps the foremost transformation in art (Shlain 1991:189), fractured space and time into visual fragments and escaped the shackles of realism. This was the first major change in the perception of space in the 2,300 years following Euclid.

Einstein and the Cubists proposed alternative concepts of space. U-commerce, the topic of this article, presents an alternative view of space and time with respect to marketing. Coincidentally, these three perspectives have their basis in light. The special theory of relativity asserts that the speed of light is constant and that $E = mc^2$. The Cubists innovated with the recording of light and revolutionized art. U-commerce, as well as its predecessors, is founded on using the electromagnetic spectrum and light to communicate (i.e., fiber optics) (Stix 2001) and thus the claim of "doing business at the speed of light." U-commerce will transform our view of business by changing the interaction with customers in time and space. Already we see a flattening. The three-dimensional store has been replaced by the two-dimensional Web browser. The multiple discontinuous connection points (home phone, work phone, and e-mail) are rapidly being usurped by the single, always

FIGURE 1
Raphael's *School of Athens*



SOURCE: http://www.vatican.va/museums/patrons/documents/vm_pat_doc_12101999_raphael_en.html.

reachable, mobile phone. Just as physics and art had to adjust to different visions of space and time, so must marketing and business. Of course, with the proper approach (e.g., the use of shutter glasses), the Web screen can become 3-D in a stereo-optical sense (see Holbrook 1997). Again, this approach illustrates a unique and potentially transforming feature of the Web—its ability to mimic the attributes of so many other media (both print and broadcast) and its ability to appear (to some users) as an entirely new medium.

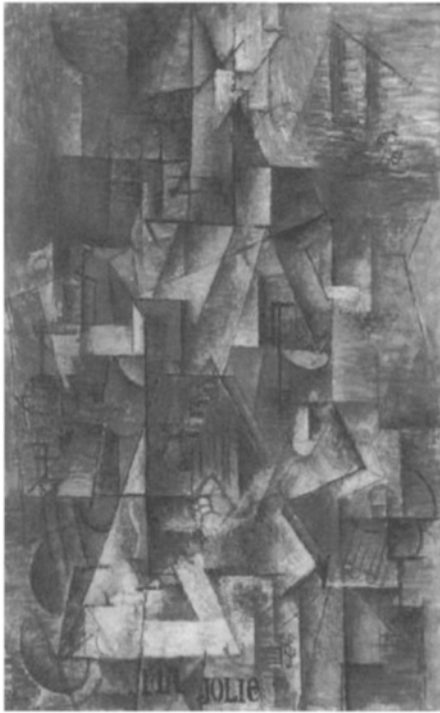
A consideration of the time and space transformation lies at the heart of an understanding of the new context of commerce. We are now in the midst of the transition from the geography-driven to the *network-driven firm*. Networks (e.g., phone, Internet, cell phone) are the lubricants of modern enterprise, and emerging network developments, as we discuss later in this article, will refashion the topography of business.

Traditionally, business has been biased by geography and located near rivers, roads, and other transport services so that the costs of being reached by customers or reaching

customers are lowered. Network organization began to attract the attention of marketing scholars in the early 1990s (e.g., Achrol 1991). Network-driven firms are a directed collection of electronically interacting stakeholders—or objects, in computer science parlance (Watson, Zinkhan, and Pitt 2000)—that coordinate their activities through the exchange of messages over electronic networks. The network-driven firm strives to embrace electronically its full range of stakeholders. For example, customers purchase via the Web, suppliers use XML-based document exchange across the Internet to coordinate activities, and investors attend annual meetings via video conferencing. The network-driven firm understands that networks are both a means of increasing efficiency (e.g., lowering transaction costs) and effectiveness (e.g., adding value to customers) and that the firm's future is shaped symbiotically by the interplay of strategic thinking and network technology advances.

The objectives of this article are threefold: (a) to describe the nature of u-commerce, including ubiquitousness, universality, uniqueness, and unison; (b) to apply the

FIGURE 2
Picasso's *Ma Jolie*



SOURCE: <http://worldimages.homestead.com/moma4big.html>.

concept of u-space to introduce new activities and definitions of marketing for the twenty-first century; and (c) to discuss the implications of u-commerce for marketing managers and academics. Some of the applications that we describe are currently being perfected in the marketplace. Other applications are still being developed but make sense, given the evolutionary nature of human interactions with information technology (IT).

NEW SPACES FOR MARKETING

The notion of one-to-one marketing, which contends that customers can and should be addressed individually, one at a time (Peppers and Rogers 1993; Peppers, Rogers, and Dorf 1999), is now well established in marketing thinking. There are two opposing forces striving for the attention of marketers. On one hand, they feel compelled by customers and competition to provide everything that the individual wants in exactly the way that they want it, at exactly the right time. Customers want tailoring, personalization, and customization, and marketers strive to provide these in a way that not only beats competitors but also allows them to build relationships with individual customers. While in principle this thinking is difficult to fault, in practice, one-to-one marketing can be excessively difficult to manage.

Managers may attempt to be and even regard themselves as rational, but what this rational view of marketing decision makers neglects, according to Nobel Laureate Simon, is the cost implicit in “calculating the optimal, which might even be very high and thus discourage investigation to discover the maximum optimal return” (Modigliani 2001:86-87). In their efforts to balance effort exerted and time spent, managers are rational but boundedly so. In a one-to-one context, while one-to-one relationships are ideal, they carry the tremendous costs of learning about the different needs of millions of individuals. Managing individual customer relationships on a large scale places enormous demand on managerial time. So, while the rational manager realizes that the ideal strategy might be to manage customers one-to-one all the time, reality causes this rationality to be bounded, and instead, managers do the best they can under the circumstances. Customers are similarly affected in their purchasing behavior by bounded rationality.

Every day, every firm competes with the bounds of rationality. Humans’ limited capacity to process information forces them to make compromises, or satisfice, in almost all their decisions (Simon 1976). The source of bounded rationality is our limited capacity to process information, and information technology presents the prospect of alleviating this shortcoming. The particular problem now faced by marketing is how to use networks to extend the bounds of rationality of existing and prospective customers to attain marketing goals. Conversely, if we can use networks to extend the bounds of rationality, how do we use networks to ease the burden of information processing so as to retain customers?

The American Marketing Association (AMA) defines marketing as “the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives” (e.g., Bennett and AMA 1995; Kotler 2000). Implicit in this definition are assumptions about the temporal and spatial separation of buyers and sellers, as well as of the sequential stages in marketing planning operations. As we will explore in this article, these boundaries or distinctions are being extended and blurred as the time-space paradigm on which traditional marketing is based implodes into the “virtual-now” of the network age (Berthon, Pitt, and Watson 2000).

We contend that the next generation of network technology can be used to expand the bounds of rationality and marketing. We first review the forthcoming environment, and then we discuss how it can be used to expand the universe of marketing.

Bounded Rationality

People are capable of a wide variety of substantial and systematic reasoning errors related to economic decisions

(Conlisk 1996). For example, in purchasing large appliances, consumers tend to buy models with low price and high energy use even though, at plausible discount rates, the initial price saving does not compensate for the subsequent energy costs (Hausman 1979). Given that bounded rationality affects consumers' decision making, it is surprising that it has attracted little attention by marketing scholars. One exception is Dickson's (1992) theory of competitive rationality, but he deals with macro issues rather than individual behavior. A search of citations and abstracts in peer-reviewed journals for "bounded rationality" using ABI-Inform reports about 100 articles. The majority of these are in the economics literature.

Three conditions limit the consumers' ability to behave rationally (March and Simon 1958):

1. Consumers do not know all their alternatives.
2. The consequences of these alternatives are not known with certainty.
3. The consumer does not necessarily have complete utility-ordering rules for evaluating consequences.

To simplify their lives, consumers typically use simplified models or heuristics that capture the main features of a decision without handling all its complexities. Information technology has the potential to extend the boundaries of rationality by enabling the consumer to identify more alternatives and by providing information-processing capability for analyzing choices. In the ideal situation, consumers will have ubiquitous access to information-processing and storage capability so that the boundaries of humans' limited rationality and information processing are permanently expanded. Before we explore how technology can extend the boundaries of rationality, we need to review the effects of the next generation of information technologies.

NEXT-GENERATION NETWORK EFFECTS

In the past few years, e-commerce has joined the vocabulary of many languages. Many organizations talk of "I-commerce" or the use of intranet technologies (internal corporate Internets) to pursue internal marketing strategies. Already, m-commerce (mobile commerce) is gaining currency as cell phone owners acquire access to mobile services such as Delta Airlines' arrival and departure information service for mobile phones and personal digital assistants (PDAs). Marketing practitioners will be very concerned with the impacts that these technologies will have on their organizations and on their relationships with customers. Marketing scholars will need to study how these technologies will affect the discipline to determine whether existing theories will explain the phenomena

adequately or whether new theories will be needed. Likewise, marketing teachers will want to keep their students at all levels abreast of events and developments, for they will be better equipped to deal with turbulent work environments if they at least have a point of view. Where are we ultimately headed?

We believe that in the next few years, we will see the emergence of a multifaceted *u-commerce*, where the *u* stands for ubiquitous, universal, unique, and unison. We can think of it as *Über-commerce*—over, above, and beyond traditional commerce. Thus, we define *u-commerce* as the use of ubiquitous networks to support personalized and uninterrupted communications and transactions between a firm and its various stakeholders to provide a level of value over, above, and beyond traditional commerce. We now elaborate on each of these four features of the next generation of commerce.

Ubiquitous

Networked computers will soon be everywhere. Low-cost microprocessors and network connections will be embedded in all consumer-durable devices—the fridge, washing machine, oven, and many other familiar household objects. Already, a car has somewhere between 30 to 40 processors. The Korean appliance manufacturer LG (Lucky Goldstar) is advertising home air conditioners that can be called from a mobile phone and timed to switch on and turn to a particular temperature setting. We also expect to see networking technology embedded in a wide variety of entities within the environment (e.g., buildings and signs) so that we have a *street-smart* society.

Every one of these devices will be connected to the Internet via the electrical wiring system of a household or community wireless network. These low-cost Internet-connected computers will add intelligence to everyday entities to improve their usefulness and information-providing capacity. Envision a car that can detect when the battery is about to fail, search the Internet for the best local deal, and determine from your calendar when to schedule installation. Imagine a building that can retell its history in any language to an admiring tourist through that person's cell phone. At the same time, the car, via a wireless Internet connection, could receive software upgrades or minor repairs (e.g., to the digital steering system) as the owner sleeps.

The ubiquity, or omnipresence, of computer chips means not only that they are everywhere but also that they are, in a sense, "nowhere" for they become invisible as we no longer notice them. Marketing has a nice parallel for this in the past: the 1918 edition of the Sears Roebuck catalog featured a "Home Electric Motor," for newly electrified homes, with grinding, buffing, and brushing attachments. Today, we no longer notice electric motors in our homes, although they are everywhere. We do not

consciously think of them as we use them to keep our time, brush our teeth, dry our hair, scramble our eggs, and play our music.

The mobile phone is a good early example of ubiquity. Already, mobile phones are accessible to people beyond the reach of today's Internet, notably those in the developing world, because they do not require complex and costly PCs. They therefore bring many of the benefits of the Internet to a far wider population than is able to enjoy them at the moment. They are having a significant impact on consumer behavior in countries such as Nigeria, for example, which have never had credit card systems and have not been able to enjoy the economic benefits of increased liquidity. Cellular phones can be used to store cash, which can be transferred by "phoning" it from one device to another. In Africa, particularly South Africa, "pay-as-you-go" cellular phones have revolutionized communication by bringing it within reach of the masses, which have not previously had access to land-line telephones. Coca-Cola and the major mobile phone company Vodacom are working on a project that allows a mobile phone user to "phone" a vending machine, which will then release the required number of cans of beverage, debit the user's telephone account balance, and credit Coca-Cola with the sale.

Real ubiquity of computers means that they are not just in durable devices but, indeed, everywhere. It is feasible that one day, disposable silicon flakes will be in every manufactured object, not to do advanced processing but simply to make every object part of the ubiquitous network and carry out a few simple but critical tasks.

Universal

The current collection of computers—desktop, laptop, cell phone, or PDA—is limited in their usefulness because they are not universally usable. For example, a U.S. cell phone is unlikely to work in Europe because of different standards and network frequencies. In the future, consumers will have a universal phone that will enable them to stay connected wherever they are. The laptop and PDA will also gain universality and be always connected to the Internet via a wireless network or satellite, wherever the owner is.

The Internet has also become universal in another way by being even more portable than a laptop or PDA. One can travel to most places that have Internet access nowadays and still access one's "own" Internet. Simply by using someone else's machine, travelers can access their e-mail, bank, share trading account, and online betting facility without physically carrying anything with them. Most airline business class lounges and major hotels offer free Internet access today, and many firms and institutions have facilities for visitors. The need to carry something (certainly something as heavy as a laptop) is decreasing rapidly.

Note that both *ubiquitous* and *universal* can be viewed from the perspective of (customer) access. In other words, one marketing goal is to provide the user with ubiquitous and universal access to both devices and infrastructure. Nonetheless, another marketing principle applies. It is important to tailor information for customers so that it matches their specific location and context.

Unique

Information can easily be customized to the current context and particular needs of each person. For example, insurance companies might require their motor policyholders to have their vehicles fitted with a GPS device. Premiums will then be charged based not on the traditional variables, such as age and place of residence, which have been presumed to determine risk, but on factors such as how often the car is used and where it is driven, which arguably are more precise determinants of accident risk (Litman 2001).

Imagine that a customer wants to receive each day the two top global and three major U.S. news stories, as well as the most important news of where they are currently located. Consumers will be able to customize news services so that a unique news profile is delivered to their current connected device in the appropriate format. If connected via a desktop, they will get full text, images, video, and audio. Connected via a cell phone, they will get 60 seconds of audio and, via a PDA, roughly a hundred lines of text. Mass customization of information is already available, and the next IT generation will add contextual customization.

Uniqueness in its full bloom means that consumers will receive information that is dependent based on the time of day and the persons' location, current role or multiplicity of roles (e.g., tourist, parent, commuter, manager), and their expressed or learned preferences (i.e., learned by the systems providing the service). The mobile phone, particularly one using the global system for mobile communication (GSM), already has a higher level of uniqueness than a PC- or laptop-based Internet system (see Table 1).

Recent U.S. legislation requires that mobile phone companies enable the precise pinpointing of emergency calls. While e-commerce and the Internet have suggested that location is irrelevant (Watson, Berthon, Pitt, and Zinkhan 2000), suddenly, location matters again. JNAvi is a service in Japan (the first country in the world to use third-generation mobile phone technology) that lets users enter a phone number, address, or landmark and then searches the area within a 500-meter radius. This makes it possible to find the subway station nearest to a particular shop or a particular restaurant within walking distance of a specific office building. Users of the service can download a full color map. At launch in May 2000, JNAvi was expected to handle 100,000 hits per day. By day 3, it

TABLE 1
Comparison of Mobile Phone and Internet on Uniqueness

<i>Mobile Phone</i>	<i>PC or Laptop-Based Internet or E-Commerce</i>
Used by only one person	Multiple users, often a family or people in an office
Owners have the phone with them for most of their waking hours (use is initiated by the owner and those who wish to contact that person).	Will only be switched on or accessed when really needed (use is initiated by owner[s])
Text messages go direct to the phone, and the owner is immediately notified as long as the phone is turned on.	Text messages (e-mail) go to an e-mail server; owner has to access these.
The network operator usually knows exactly who that user is, his or her home and office address and other information, and where that person is geographically	The network operator does not necessarily know exactly who the user is or whether that person's details are correct. There is speculation that most users of free e-mail services such as Hotmail give false details, and there is no facility for the provider to really check. The network provider does not know where that person is geographically.

already had 1.6 million hits. Now, it has 2 million hits a day, and 50,000 users a day request a map.

There is a lot of potential for mobile advertising. When visitors to Singapore land at Changi Airport and turn on their mobile phone, they immediately receive a few short message service (SMS) messages. One is from the local phone company, SingTel, offering reduced international calling rates. Another is from the Singapore Tourist Authority, providing contact numbers for cab companies and hotels.

Unison

When consumers have complete agreement between their phone book, calendar, to-do list, and other such files across a range of electronic tools (i.e., cell phone, computer, and PDA), they have unison. This term means that the phone book on a computer matches that on a cell phone and all other electronic phone books maintained. A change in one phone book is transmitted to all others with complete transparency to the owner. The same is true for address books, diaries, and to-do lists, as well as links to Web sites and wireless application protocol (WAP) sites. Specified files will be kept in unison so that location becomes irrelevant. The required information will always be available irrespective of the device and location. Unison means the integration of various communication systems so there is a single interface or connection point. For example, all phones (work, home, mobile) have a unified and personalized voice mail system. As implied by the previous sentence, we use the noun *unison* and the adjective *unified* as synonyms in this article.

A CONCEPTUAL FRAMEWORK FOR U-COMMERCE

We organize our thinking about u-commerce through a conceptual model of two dimensions: time-space

specificity and mode of awareness. The notions of the objective and subjective also distinguish these two dimensions. In structuring the objective domain, time and space are considered intrinsic categories (Kant 1998) and give rise to the distinction between time-space specific and time-space unspecific commerce. In the subjective domain, the conscious and unconscious are considered primary categories (e.g., Freud 1953; Jung 1969). In this instance, we employ the distinction between the ultraconscious and unconscious. Both relate to each other in the figure-ground distinction of perceptual organization articulated in Gestalt psychology (Köhler 1970).

Dimensions

We argue that markets are going through a three-stage progression: marketplace → market-space → u-space that is described in Table 2. The traditional marketplace, one in which physical goods and services are exchanged face-to-face by humans, is replaced by the market-space (Rayport and Sviokla 1994), which enables the exchange of goods and service via informational transactions conducted electronically through computer networks.

U-space, the new arena of marketing, has two dimensions. Time-space specificity, the first dimension, ranges from the unique (time-space specific, localized) to ubiquitous (time-space unspecific, everywhere). Thus, for the consumer, technology can either be unique (i.e., localized in time and space) or ubiquitous (i.e., dispersed in time and space and everywhere). The second dimension, awareness, ranges from the unconscious (behind or out of consciousness) to ultraconscious (extension or enhancement of awareness). Technology can amplify or attenuate consciousness as directed by the consumer. First, it can extend or enhance a consumer's ordinary awareness (i.e., make it ultraconscious). Second, it can take something that once occupied a consumer's conscious awareness and perform it automatically (i.e., render it an unconscious process for the consumer). U-space delineates four

TABLE 2
Evolution of Markets

Market	Definition	Theme
Marketplace	Traditional physical marketplace	Exchange of goods and services via face-to-face human interaction
Marketspace	Informational marketplace	Exchange of goods and services via computer interaction
U-space	Transcension and integration of marketplace and marketspace	The global integration of physical and informational to provide value through amplification, attenuation, contextualization, and transcension

TABLE 3
Types of Marketing

Type of Marketing	Description
Amplification	Processes ^a that create value by extending or enhancing conscious interaction with phenomena
Attenuation	Processes that create value by reducing the necessity of consciously interacting with phenomena ^b
Contextual	Processes that are time-space ^c specific and add value through their specificity (Kenny and Marshall 2000)
Transcension	Processes that create value by transcending, or enabling transcension, of the traditional constraints of time-space

- a. We use the term *process* (in the sense of the change—physically, conceptually, emotionally, extensionally—that occurs during or as a result of interactions) as a unifying concept to encompass products, services, solutions, experiences, and so forth.
- b. We use the term *phenomena* in the philosophical sense of immediate objects of perception as distinguished from “substance” or “thing in itself.”
- c. We use time-space context in the sense of a phenomenal time-space. This presumes a conscious individual or collective. Thus, it encompasses time-space in respect to an individual’s or group’s time-space. It thus encompasses the following questions: when, where, who, and why?

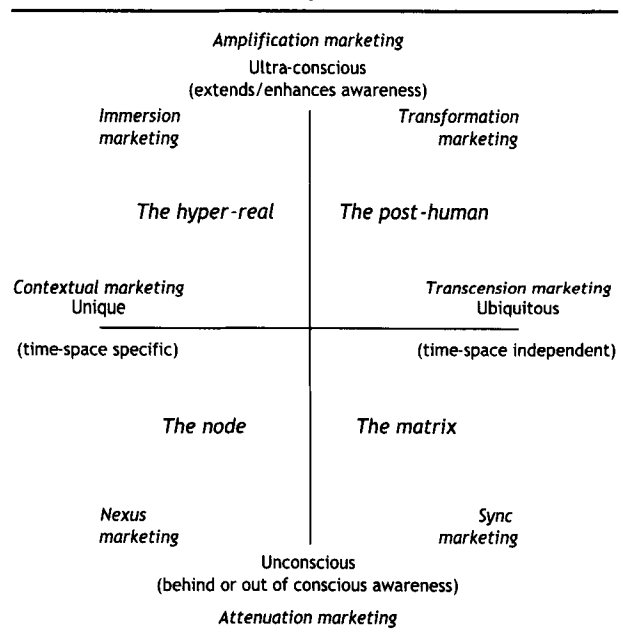
types of commerce—the hyperreal, the posthuman, the matrix, and the node (see Figure 3)—and four forms of marketing, described in Table 3.

The Hyperreal (Ultraconscious, Unique)

When technology delivers value to consumers in such a way as to extend normal conscious experience to unique contexts, we have the realm of the “hyperreal.” Such marketing processes currently include guided tours to Mount Everest supported by oxygen tanks and a team of experienced, satellite radio-connected Sherpas (Krakauer 1997); entertainment (e.g., a movie, theater, concert); and other context-specific experiences. Arnould and Price (1993) coined the term *extraordinary experience* to describe a personal, memorable experience that a consumer can have with a product or a service, and they provided the example of whitewater rafting to illustrate how consumers go through this type of time-space specific marketing performance. In the future, this quadrant will increasingly comprise manufactured experience (e.g., virtual worlds) and enhanced experience such as teleimmersion (Lanier 2001) and telepresence (Alpert 2001). By *teleimmersion*, we mean immersing a person in a computer-generated world that provides suspension of belief and transports the person to another world.

Thus, this is the domain of the *immersion marketing*, the extension of the experience economy (Pine and

FIGURE 3
U-Space



Gilmore 1999) to the network age. Immersion marketing comprises processes that combine the extension or

enhancement of an individual's or collective's conscious interaction with the phenomenal world in specific situations. Consciousness is immersed and extended into enhanced or artificial realities. Everyday experiences are enriched and expanded.

The Posthuman (Ultraconscious, Ubiquitous)

When technology is used to deliver value in such a way as to extend consumers' normal conscious experience ubiquitously (i.e., across time and space), we have the realm of the "posthuman." This comprises processes that are always "on" and always present independent of a person's location (Kleinrock 2001). This results in a permanent enhancement of human faculties. The progression is likely to be from information storage and processing enhancement (the present) to advanced prosthetics and genetic enrichment of the cyberhuman. This quadrant is the sphere of transformation marketing and currently deals with issues such as marketing body change (e.g., breast enlargement, rhinoplasty).

Transformation marketing comprises processes that combine the extension or enhancement of an individual's or collective's conscious interaction with the phenomenal world, acontextually (i.e., without context by transcending specific time-space locations). Some archetypes of this process are the contact lens (on a hardware level) and education (on a software level). Thus, teaching and learning permanently and ubiquitously (i.e., acontextually) transform the software of an individual or group independent of context. This will be greatly extended in the future, both at a human software and hardware level. On the software level, mind-machine interfaces (via neural grafting) will allow electronic implants that will facilitate the enhancement of memory, computation, and communication. Ultimately, humans' minds are likely to become permanently integrated into the matrix. On a hardware level, examples include biomachinery, advanced cybernetic prosthetics, and genetic engineering of the posthuman (e.g., Warwick 1998). In 1998, Kevin Warwick, a professor at Reading University in the United Kingdom, underwent an operation to surgically implant a silicon chip transponder in his forearm. This experiment allows a computer to monitor him, using a unique identifying signal emitted by the implanted chip. He can operate doors, lights, heaters, and other computers without lifting a finger. The technology has the capability to affect the lives of individuals in ways that have been previously thought possible only in works of science fiction. The implant could carry all sorts of information about a person—for example, credit card details, National Insurance or Social Security numbers, blood type, and medical records—with the data being updated where necessary (Project Cyberborg 2001 2001).

The Matrix (Unconscious, Ubiquitous)

In this quadrant, technology delivers value in such a way as to remove and perform tasks outside or behind awareness and ubiquitously (i.e., across time and space). This quadrant is dominated by omnipresent network infrastructure technologies (e.g., Internet, cell phone, GPS, Wi-Fi, Iridium, sensornets). From a marketing perspective, the store becomes omnipresent (Peppers et al. 1999).

Sync marketing, the focus of this quadrant, consists of the universal, acontextual processes designed to automatically perform processes on behalf of the individual or collective. This is the omnipresent, self-regulating, self-learning matrix, and the quadrant is the counterpart to the node. Value is added through *synchronous marketing*—the replication, updating, and integration of processes across time and space. Changes or additions added at any point in the network automatically propagate throughout the entire network. The network *learns*.

An early example of matrix marketing was Usenet, which automatically replicated and synchronized data or articles between Usenet servers. If an article was deleted (by accident or on purpose) on one server, the system automatically "repaired" the document. Similarly, if an article was added to one server, it was automatically distributed to and replicated on all Usenet servers. Another example is the next generation of Web services (business applications that share information with other programs across the Internet and thus replace conscious human-computer interaction with automatic computer-computer interaction) and their associated languages (SOAP, WSDL, and UDDI). A third example is the semantic Web, which encompasses the sharing of meta-level information, so that machines can comprehend semantic documents and data, thus enabling Web sites to be automatically found, linked, and integrated on a semantic or meaning level (Berners-Lee, Hendler, and Lassila 2001). Currently, the most common example is perhaps the SIM chip in GSM phones, which handles billing and roaming charges across networks and continents. In this category of experience, marketers work to relieve consumers of routine chores. For instance, in a business-to-business (B2B) setting, the buyer may cede decision-making authority to the buyer. The possibilities of such an alliance are enhanced by the judicious application of information technology.

The Node (Unconscious, Unique)

In the node quadrant, technology creates value by performing tasks outside or behind awareness in specific time-space locations. It is the market place of traditional subscription services. The purchase of the local news-

paper, cable TV, and some utilities, for example, involves unconscious, unique consumption. Consumers did make a decision at one point to initiate the consumption, and now renewal is automatic or routine. In the business-to-business sphere, for example, this manifests itself in the form of self-diagnosing, self-reporting products that interact with their original suppliers to a far greater extent than they do with their owners. In this way, the owner receives great service and backup, often without knowing it, and the vendor is able to achieve sustainable advantages (lock in) while gathering lots of information. As an illustration, wireless sensors make it possible to gather ever more information about the physical world and feed it into a company's computer systems. Turbines made by GE are equipped with sensors that allow the firm to tell its customers online how efficiently their machinery is operating (Siegele 2002). Indeed, it is even possible for GE to spot a potential problem on a GE machine and dispatch someone to deal with it before the problem actually occurs and before the customer is even aware of it.

Here, we are in the realm of automated consumption or usage. The services consumed are so routine or so trivial that the customer wants to pay the least attention possible and thus is willing to assign these tasks to technology. Smart cards and chips containing personal electronic information will automate personal consumption of service staples (Sheth and Sisodia 2000). Interestingly, consumers are quite accustomed to paying a few cents to a mobile cell phone company for an SMS message but seem reluctant to make any effort to pay small amounts online; as Schwartz 1997 put it, when it comes to the Web, "Micropayments = Microfuture."

In many advanced countries, we do not think of a consumer decision when we switch on a light or ignite a gas jet. Yet, these kinds of activities are quite significant, in terms of consumer resources. However, there are less advanced economies where these can be conscious decisions (e.g., putting another coin in the gas heater slot).

Nexus marketing comprises processes designed to reduce the necessity to consciously interact with phenomena in specific contexts (e.g., electronic toll collection) (Fischetti 2001). It is all about the use of time-space specific connections (nexuses or nodes) to perform processes on behalf of the individual or collective. This is the realm of the node, the counterpart of the matrix; the nodes comprise the matrix, and the matrix enables the node.

An example illustrates nexus marketing. While standing in Boston Common at 10 a.m., you request, via your mobile phone, advice on finding an Indian-vegetarian restaurant within walking distance. Via GPS, your position is determined, and a list of open Indian-vegetarian restaurants and their ratings, distances, and the directions from Boston Common are transferred to your phone screen. The contextual (time-space specific) processes of location finding, map reading, and distance calculation are all performed

automatically (i.e., out of the individual's conscious awareness).

Part of this quadrant is occupied by efforts such as customer relationship marketing (CRM), in which firms are trying to understand individuals so well that their offers add unique value to the prospective customer. Thus, relationship marketing is needed to capture customer information in a way that is almost invisible to the customer.

If we take this thinking to the highest level (Godin, 1999, referred to this as "transfusion marketing"), it is the ultimate form of permission marketing and probably the definitive marketing relationship. The consumer delegates decision-making authority to the supplier, and if the supplier manages this well, it gets to control the consumer's spending, not just make decisions on the consumer's behalf. An electricity bill is a simple example, but the real masters of this marketing are direct marketers who get consumers to let them choose products on their behalf and spend on them what is necessary. Members (customers) of the Wine-of-the-Month Club (WOTMC, which is really a business, not a club) in South Africa authorize the club to purchase chosen wines on their behalf each month and to debit their credit cards with the appropriate amount (up to a predetermined limit). Unless the WOTMC really upsets a member or the member dies or moves away, the WOTMC has a guaranteed mandate to provide or transfuse wine, with all the future cash flow benefits that adhere thereto.

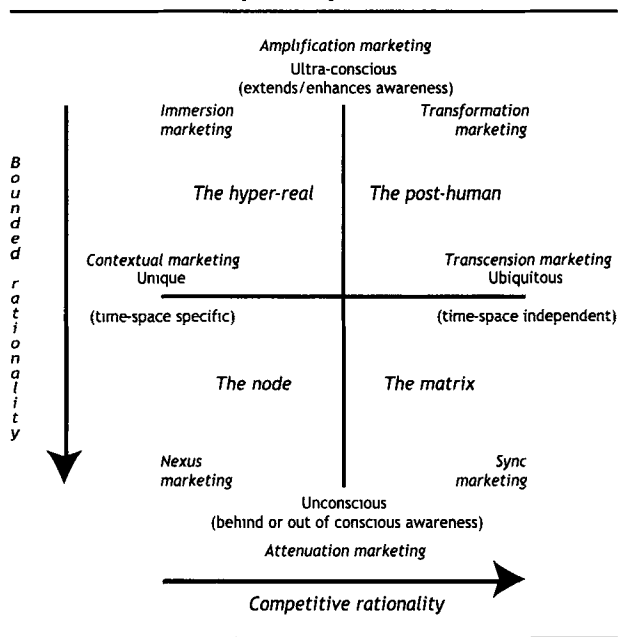
Model Dynamics

U-space is not static. The ultraconscious experience of today becomes tomorrow's ubiquitous, unconscious activity. Technology's trajectory is to turn the manually executed into the automated. The factors that drive this dynamic along the subjective and objective axes are, respectively, bounded rationality and competitive rationality, which we elaborate on in the following sections (see Figure 4).

Subjective Domain

Movement in the subjective domain results from the interaction of three elements: finite conscious attention, the complexity of the task or lived environment, and improvements in technology. Ashby (1958) contended that for an organism to prosper in a given context, its internal variety must equal or be requisite to the variety in the environment. Human organizations have to use variety attenuators and amplifiers to fulfill Ashby's law of requisite variety (Beer 1981). Simon (1990) argued that, at the level of the individual, given the complexity of even a reasonably simple and structured task such as playing chess, the complexity is such that players have to satisfy (Simon 1990) or use heuristics to attenuate and amplify variety (Kahneman, Slovic, and Tversky 1982).

FIGURE 4
U-Space Dynamics



Given the increasing complexity of the consuming environment and the fixed attentional capacity of individuals, consumers need ways of attenuating and amplifying variety. The adoption of heuristics reduces processing, maybe even to the point that certain information processing is unconscious across a range of tasks. Technology increasingly enables this shift. Once executed by a machine, these tasks become unconscious (i.e., disappear from the conscious awareness of the individual), leaving the consumer to focus his or her limited attention on other, possibly higher order tasks. Consider such an everyday transaction as paying for an item. Using cash, the consumer has to pay attention to counting out the amount and then verifying the change. Using a credit card, however, requires less attention as the consumer now has to only verify the amount written on the receipt. At the next level, the consumer does not even have to verify a receipt but simply preapproves a series of transactions that are made on the consumer's behalf and charged (e.g., billing on one's mobile phone and subscriptions to a book club or a wine club). Consumers, who once spent much time and attention gathering and comparing prices at different shops, can now use an Internet price comparison "bot" to perform the task in a few seconds (Pitt, Berthon, Watson, and Ewing 2001). The process, which once consumed much conscious attention, is now performed automatically by machine—freeing the consumer to focus attention on other activities.

In the past, information might have been the scarce resource. For example, it is estimated that a single

weekday issue of the *New York Times* contains more information than the average person in seventeenth-century England came across in a lifetime. Clearly, in today's increasingly complex society, conscious attention is becoming the scarce resource (Davenport and Beck 2001). Thus, for every new experience (attention-consuming interaction) that marketers thrust in front of consumers, there is a countervailing need to supply attention-freeing interactions (i.e., taking events or experiences out of conscious attention). If marketing is to succeed in the attention deficit society, it needs to actively seek means of giving back time to consumers so that they can attend to other stimuli. Firms may well think of conducting an *attention analysis* by means of an *attention scorecard* that tallies increases and decreases in consumer attention for their interactions and achieves some optimal balance for both buyer and seller.

Attention analysis would force a firm to recognize that consumer attention is a scarce resource, just like capital, that needs to be managed. Efforts to conserve attention (e.g., streamlining interactions with customer service) might create a willingness on the part of the customer to expend more attention elsewhere (e.g., testing a new product). A starting point for fashioning an attention scorecard might well be to benchmark typical consumer interactions to see where attention is being consumed excessively. Such an approach should result in a dual approach to efficiency, with the customary focus on internal efficiency supplemented by consideration of external efficiency (i.e., the customer's efficiency in dealing with the firm). There is a need to expedite and automate the routine to support investigation and exploration of the new.

Objective Domain

The interplay of market dynamics and competitive rationality (Dickson 1992) drives movement in the objective domain. Variety-seeking behavior by consumers and variety generation on the part of firms motivate innovations. Competitors imitate and refine the innovation helping to grow the market and increase penetration as costs fall. Soon, that which was innovative and unique becomes passé and ubiquitous. Consider today's mobile phone. The genesis of this product in military radiophones led to the exclusive car radio phone, which in the space of 15 years has been converted through the dynamics of competition into today's omnipresent mobile phone. Interestingly, uniqueness and ubiquity require distinct market strategies, respectively, of differentiation and cost leadership (Porter 1980).

The movement from the unique to the ubiquitous, driven by technology, has been well documented in the social sphere in Giddens's (1984) notion of "time-space distanciation," which comprises the stretching of social relations across time and space, a process enabled by ubiquitous telecommunications.

IMPLICATIONS FOR MARKETING

Humans are five-channel information processors (see, hear, feel, smell, touch), and it is perception, through the combination and interaction of these five senses, that determines the quality of a product or service. For example, a customer's perception of a car is based on its design, the sound of the engine, the feel of the highway, the smell of the interior, and the touch of the accelerator. We engage all of our senses in the assessment of any object or event. At its core, marketing is about the delivery of information because it is concerned with engaging the consumer's information-processing capability to create a favorable impression or encourage certain behavior.

Furthermore, one can argue that the epoch-changing events of civilization have been those that significantly altered our capacity to process information (see Table 4). Digitization, which is the driving force of the current period, started with the telegraph and Morse code in the mid-nineteenth century. Prior revolutions, such as the alphabet (Shlain 1998), have had profound effects on society. Revolutions take time to accelerate and reach their terminal speed because of the compounding effect of innovations flowing from the breakthrough invention. We are still on the upward slope of the digitization revolution. Some input channels have recently been digitized (e.g., sound). Others are already in the research labs. Cyrano is a proprietary sensing technology invented at the California Institute of Technology that provides a breakthrough capability to transform scents into digital "smellprints" via a small, low-cost NoseChip™ (Cyrano Sciences 2001). Digitization of the senses of touch and taste is probably on the drawing boards at the time of this writing.

Issues for Researchers

U-commerce represents the next step in digitization as true ubiquity has profound implications. Thus, marketing and other scholars need to be preparing for this final destination and recognize that e-commerce and m-commerce are way stations on the path. They are signposts on the road from somewhere to everywhere. To traverse this path, marketing scholars need to investigate several significant issues.

Revalidate Existing Theories

There have been a number of specific theoretical contributions to marketing in its relatively brief history as an academic discipline. At a broad level, for example, these have included Alderson and Cox's (1948) attempt to formulate a general theory of marketing, Bagozzi's (1975) expostulation of a theory of marketing as exchange, Dickson's (1992) explanations of marketing behavior at both the firm and customer levels as manifestations of competitive rationality, and Morgan and Hunt's (1994) notions of marketing

as relationships mediated by commitment and trust. At more specific levels, for example, we have seen attempts to explain narrower and more particular aspects of marketing, such as channel structure (e.g., Bucklin and University of California, Berkeley 1966). We need to revalidate our major theories and notions of best practice because these were developed during the era of traditional marketing and the industrial economy. If these and the other theories that have been expounded in the major academic marketing journals are indeed powerful theories, then they will prove constructive in explaining what u-commerce will mean to organizations, managers, customers, and individuals, as well as the ways in which to understand this. If these theories prove to be less potent for u-commerce than they have been in their explanation of other, better known marketing phenomena, then perhaps we need new theories in marketing. In addition, many of these theories are provincial because of their North American origins (Boyacigiller and Adler 1991). For example, we might need to develop a theory of electronic consumer behavior, based on our present knowledge of consumers, and extend it to cater for culturally diverse u-consumers.

Build New Theories

Over the years, thinking in marketing has evolved from a product to a service focus (e.g., Rathmell 1966) and, we might argue today, to a products-and-services (Shostack 1977, 1987) or experiences focus (e.g., Pine and Gilmore 1998; Schmitt 1999). With u-commerce, the center of attention will migrate to information because information will become the core of marketing. People's use of information is limited by the physical means of its transmission (Taleb 2001). Until very recently (about 100 years ago), humans could not travel rapidly, and most did not travel far, so information arrived from remote places in concise batches, and most humans did not know many others beyond the confines of their own city, town, or village. Just as the range of possible suspects in a robbery or murder was limited, the range of customers that a local marketer could have was small too. Life was rather simple; hence, the space of probabilities was narrow (Taleb 2001:154). Now our society is ruled by information, and information is ruled by probability. Marketing academics will need to identify or formulate theories that will aid in the explication of information and probability's impacts on the actions of organizations and the behavior of their customers. A superabundance of information and humans' limited processing capabilities are likely to exacerbate information asymmetries between parties in many forms of exchange (e.g., negotiation, buying and selling, and legal proceedings). Thus, a starting point might be the work of Nobel Prize winner Akerlof (1970).

Information will differentiate products because of its ready malleability and atomization. Questions that marketers will need to include are the following: what will be

TABLE 4
Human Information-Processing Revolutions

Symbolic thinking
Signing
Drawing/painting
Speaking
Writing
Alphabet
Arabic numerals
Printing technology
Photography
Motion pictures
Electronic sound (radio, recordings)
Electronic video (television)
Electronic computing
Digitization of sound
Digitization of pictures

the appearance and characteristics of an information-based theory of marketing? How would we reconceptualize our understanding of services if we position information at the heart of services (i.e., information is service)?

New Forms of Marketing

In this article, we have defined several new forms of marketing (e.g., attenuation marketing, matrix marketing, and transformation marketing). Further work is needed to develop these concepts. Also, both academics and practitioners alike will need to distinguish between genuinely new and useful concepts, as well as the buzzwords and hype generated by some consultants and the popular press.

Amplifying and Attenuating Consciousness

The management of conscious attention is likely to become one of the *key* challenges of u-commerce. Marketers will have to learn what *aspects* of consciousness consumers want amplified and attenuated and in what *contexts*. As a first stage, marketers will have to explore, for a given product or service (through interrogation, observation, and experimentation), what aspects of an offering (1) amplify consciousness, (2) consume attention, and (3) attenuate consciousness. Importantly, that which consumes attention may not amplify or attenuate consciousness. Thus, a second stage would be to ask, "Is the focus of attention adding value?" For example, a mobile videophone enhances the ability of a person to communicate over long distances, irrespective of location. However, its *operation* might be complex and cumbersome, consuming attention without adding value (i.e., without amplifying or attenuation attention). A third stage might be to redesign the offering to rebalance amplification, consumption, and attenuation. For example, the operation of the videophone via a complex series of keystrokes (attention

consuming) might be replaced by a single voice command (attention attenuation).

Implications for Marketing Managers

U-commerce represents a major transformation of the business and marketing landscape. A new environment is emerging in which it will be imperative for managers to adopt and hold a point of view if their organizations are to survive and prosper. We identify three questions that decision makers must ask (although there will inevitably be many more managerial concerns that will emerge over time).

What Will U-Commerce Do to a Business and Industry Over Time?

U-commerce will affect the customers served by an industry and the firms within it so that marketing decision makers will have to ask what changes it will cause in customer behavior and the nature of firms within the industry. Obviously, it also has the potential to change the products and services provided by a particular industry and, in many cases, may render them redundant. For example, the all-too-familiar home telephone may be superfluous when all members of a family have their own mobile telephones. The connectivity created by ubiquitous networks also means that the nature of communication between an organization and its stakeholders changes from a simple, unidirectional model to a complex multidirectional one in which stakeholders can more easily communicate with other stakeholders and with each other (Pitt, Berthon, Watson, and Zinkhan 2002). The nature of competition will change, and technology might enable new entrants to take up large shares of existing markets at relatively short notice. This will mean that managers have to focus not only on the behavior of existing competitors but also on those entrants exploiting ubiquitous technologies. For example, when mobile phones can store and transfer money, the mobile phone industry becomes a potential competitor to the credit card business.

In brief, u-commerce has the potential to create undreamed of opportunities in industries that, if capitalized on, will change the nature of those industries, particularly the astute firms within them. However, it may also be a significant threat to some industries, particularly those firms within them that fail to understand its nature and its impact. Obviously, its effects in some markets will be more profound than in others. Managers will need to beware of complacency and the temptation to assume that because it is difficult to envision u-commerce's effects under certain circumstances, it will have no effects. As a starting point, we advise managers to complete a competitive forces analysis of u-space for their firm and industry (Porter 1979, 2001).

How Can Firms Use the U-Space Framework?

Related to the question posed with regard to industries and firms above, the u-space framework in Figure 3 provides a tool for decision makers to consider the impacts of u-commerce and also to explore future strategic paths for u-commerce. At a simple level, the framework can be used to identify current market positions for an industry, a firm, or specific market offerings within these. Then, the appropriateness of current and proposed future strategies can be evaluated and speculated on. At higher levels, the effects of shifts from one domain (quadrant) of the matrix on market offerings, customers, and the firm itself can be explored. For example, what happens when a move occurs from posthuman to hyperreal or from posthuman to matrix? What kind of market offering does a firm provide, and what impact does this have on customers and the firm's market position?

What Will U-Commerce Do to the Structure of Firms?

U-commerce may have significant implications for the way firms are structured. This is particularly true for the marketing function within organizations. Decision makers will need to consider what the nature and requirements of u-commerce will mean to existing structures and question whether product/brand management structures will still be appropriate, whether some form of customer or market management configuration will be more suitable, or whether entirely new arrangements will be required. To a large extent, this will also be dependent on the priorities the organization places on such metrics as brand equity (Aaker 1991, 1996) and customer equity (Blattberg and Deighton 1996). It has been suggested that information technology is driving a move in organizations from product to customer management structures (Berthon, Hulbert, and Pitt 1999), but it will remain to be seen whether u-commerce accelerates this trend, reverses it, or begins to create other structures for managing marketing in organizations.

Peppers and Rogers (1993), in proposing a customer (rather than a product/brand) management approach to structuring the marketing organization, speculated on the implications that this will have for evaluation and reward systems. They added, "Rewarding customers will not be as simple, because there is no organized market for customer lifetime values" (p. 197). These issues will not only command senior executives' attention, but they should also appear on the researcher's agenda for they have to some extent been overlooked in the marketing literature. One approach for both executives and researchers to follow is to consider the financial economics literature on incentives and bonus schemes. If u-commerce promotes the idea of customer equity-based structures, thus viewing customer portfolios as investments, then rewarding and evaluating

customer portfolio managers might have much in common with rewarding and evaluating investment and bond traders in financial institutions. For example, when Salomon Brothers encountered problems with its bonus scheme in 1990, it engaged Stanford finance professor Myron Scholes to design a compensation scheme based on portfolio performance over time and into the future (Milgrom and Roberts 1992:10-11).

CONCLUSION

Major innovations in our ability to process information have been the bedrock of cultural, social, political, and economic change (Brown and Duguid 2000; Eisenstein 1979, 1993; Shlain 1998). Ubiquitous connectivity to information and computer-processing power will be a profound change that represents the ultimate consummation of the digitization revolution that started more than a century ago. Ubiquity will have major consequences for marketing because of its central role in creating wealth. After all, it is marketing's role to discover consumers' wants and persuade them to exercise these wants. Marketing's task for the near future is to discover how firms will successfully create value for consumers in the era of u-commerce.

In the bigger scheme of things, e-commerce currently has an incremental impact on marketing. If we think of e-commerce as trade that takes place over the Internet (usually through a buyer visiting a seller's Web site and making a transaction there) ("Dotty About Dot.Commerce?" 2000), then it really is not so revolutionary; the Internet is essentially just another marketing channel. Many online initiatives have evaporated as consumers have shown their unwillingness to shop using a computer interface. This may be because they want to see and touch products and deal with real people, or it may simply be that real shopping serves an important social function. The argument that e-commerce is still "very new" hardly washes any more, as it has been around for nearly 6 years and the take-off rates have slowed.

However, if we broaden the notion of e-commerce (Watson, Berthon, et al. 2000) to include whether the consumer can do something "useful" as opposed to merely purchasing, its impact on consumers' lives and marketing is more profound. People are using electronic networks to become and stay informed, perform services for themselves (such as banking, redeeming air miles, and trading stocks), interact with private and public institutions, and entertain themselves. When we extend e-commerce (or whatever we want or decide to call it) to include other devices such as PDAs and mobile phones and eventually just about every conceivable device and product, the impact on consumers' lives becomes highly significant. When consumers are using every conceivable form of computer/network-driven technology to perform just

about every task they need to as consumers, then we have real u-commerce. And marketing, as has been said, will indeed be everything (McKenna 1991).

The idea that we tend to overestimate the short-term effects of technology while underestimating the long-term effects has been variously attributed to science fiction writer Arthur C. Clark and Microsoft's Bill Gates. Taleb (2001) perhaps expressed this more effectively when he said that we "read too much into recent shallow history, with statements like 'this has never happened before' but not from history in general" (p. 93). If we see it this way, then e-commerce, when narrowly defined, has not been and is not really the "killer app" (Downes and Mui 1998) we have thought it to be. It has not changed that much in the recent short term. A killer app is not something that just performs a task better (e.g., searching and shopping for books); it changes our lives, it changes the way we live and the way the world works. In the long term, however, a more ubiquitous information technology will change marketing, and we must not underestimate the magnitude of that change. We might argue that u-commerce is the ultimate killer app for it has the potential to change everything.

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