Managing "Virtual" Customers

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Introduction

The primary challenge that firms face today is not to keep up with technological change per se, but instead to respond to rapidly changing environments, often by adopting new technologies in order to cope with environments that are themselves changing under the impulsion of new technologies. The customer environment is an excellent example of such rapid change. The proliferation of interactive communication channels and product varieties has rendered it extremely dynamic, complex, and ambiguous. Firms are attempting to cope with this complex customer environment by adopting Customer Relationship Management (CRM) tools and business practices. Observers of these initiatives recognize that the technological factors are more tractable than the cultural and organizational factors. Still, the problem tends to be framed as one of organizational difficulties of adoption of complex software-based technologies, when the diffusion of IT-intensive CRM tools and business practices might be more usefully interpreted as attempts to respond to a radically altered customer environment in which ability to properly match business routines with fine distinctions among customers is regarded as a key to survival.

Customers typically interact with the firm through as many as two dozen electronic channels at various points throughout the transaction cycle. Data about interactions and purchasing history are collected and constructed into a representation of the customer, who otherwise would appear as "virtual" – dispersed in space and time, fragmented and disembodied. Web interfaces are currently presenting the principal technological and organizational challenges of interactivity to customer-facing parts of the firm, but computer-mediated communication of all forms with customers is increasing exponentially. To be customer-centric frequently means that a firm must be able to cope with customer virtualness. CRM aims to provide the knowledge base, the communication capability, and the business processes that allow understanding and management of complex computer-mediated relationships with customers. IT-supported customer relationship management assembles knowledge of customers within the firm and flexibly deploys a variety of business processes to allow firms to learn to distinguish between more and less desirable customers and act accordingly. In this, the locus of innovation is primarily in the firm's Front Office and secondarily in its analytical support services. In a classic illustration of Ashby's Law of Requisite Variety, firms are responding to customer virtualness by building IT-enabled interfaces with rich sensing capability that provides discrimination and behavioral variety according to detailed characteristics of customers. Enabled by internetworked computing and driven by competition and proliferation of external electronic communication channels, the firm's "customer-facing edge" is evolving into an interactive, integrated, intelligent, distributed sense organ.

IT-enablement of the Front Office must employ a complex, variable mix of automation, personalization, and human communication. Management of "virtual" customers requires development of three sets of competencies within the firm: ability to select and master complex technology tools, ability to develop and maintain a customer-centric organizational configuration, and ability to manage information and knowledge about

the customer relationship. This paper describes ways that current Customer Relationship Management practice responds to customer virtualness and reviews the challenges involved in developing this new area of technology-enabled, knowledge-intensive business practice within the firm.

The Meanings of Virtual

A distinguishing feature of information-age organizations is the frequent shifting and blurring of organizational boundaries, resulting in the proliferation of internal and external relationships of varying degrees of permanency, intimacy, scope, and business significance. Networked enterprise is the paradigmatic form of post-industrial economic organization (Castells, 1996). In order to occupy a position in a value chain, firms must entertain a complex and dynamic set of relationships with suppliers, customers, employees, and stakeholders within the firm's "value web" or business ecosystem (Bovet and Martha, 2000). Information and communication technologies (ICTs) reduce internal and external transaction and communication costs, thereby increasing the spectrum of viable organizational relationships and configurations. The use of the term "virtual" to refer to networked organizations reflects the current transition from a world of relatively stable vertical hierarchies to one of more fluid and interactive horizontal social and organizational relationships.

Writers on virtual organizations have given the term "virtual" four related meanings (Su and Becheikh, 2000). Virtual organizations are ones in which employees are distributed in time and space. In particular, virtual organizations arise from the intensive use of ICTs for the coordination of spatially and temporally distributed production activities. In a second meaning, virtual organizations are externalized production systems transcending conventional organizational boundaries, in which ICT-enabled outsourcing and subcontracting relationships result in groupings or networks of firms that collaborate to produce value for end users. A third meaning of virtual focuses on the use of ICTs by "cyberfirms" for purposes of coordination and support of transactions and communication of production and distribution activities without regard to geography or time. A fourth meaning of virtual is that of a temporary network of independent firms that come together to accomplish something and then disband. Thus, the four key dimensions of virtualness are spatial and temporal dispersion, externalization of relationships, IT enablement of communication and coordination, and temporariness. Put somewhat differently, virtualness may be conceptualized in terms of combinations of four kinds "spaces" that are opened up by internetworked computing and communication technologies: an information space, a communication space, a transaction space, and a distribution space (Angehrn n.d.).   Finally, virtualness may be regarded not as a particular kind of organizational configuration, but as a strategic characteristic reflecting three vectors: a knowledge leverage vector, which permits firms to leverage knowledge and expertise across organizational boundaries; an asset configuration vector, which permits firms to source requirements across an entire business network; and a customer interaction vector, which "allows customers to remotely experience products and services, actively participate in dynamic customization, and create mutually

reinforcing customer communities" (Venkatraman and Henderson 1998). The customer interaction vector is the aspect of virtualness addressed in this paper.

The Virtualness of Customers

Firms and customers increasingly experience each other as virtual actors in the senses described above: they interact with each other over distances synchronously and asynchronously, their exchanges with each other are part of a distributed production system, their interactions are increasingly ICT-mediated or supported, and they can maintain a range of relationships, many of them of a temporary nature. The concept of virtual customer has an affinity with the root meaning of virtual from the Latin *virts* ("excellence" or "virtue" or 'worthiness") in that a principal objective of CRM enablement is to identify the most "worthy" customers (usually the most loyal ones or those with the greatest projected lifetime profitability) and provide them with superior services in order to retain them.

Key drivers of the virtualization of the customer are the proliferation of ICT-mediated customer touch points (telephone, fax, e-mail, kiosks, call centers, websites, handhelds, POS checkout stands, smart cards, credit cards, peer-to-peer technologies, smart products, etc.), the geographic dispersion of customers and company units, and the proliferation of product variety through mass customization. Companies with tens or hundreds of thousands of customers, each of whom may interact with company over any of two dozen channels regarding any one of a wide range of products or services, face a major information and coordination challenge.

Currently, interactive "e-channels" account for only a small percentage of firm revenues, while traditional selling channels (face-to-face, telechannels, business partners) account for the rest (Meta Group 1999). However, the proliferation of internetworked customer touch points is radically increasing the interactivity between firms and customers (Kenny and Marshall, 2000). In 1997, 97% of customer contacts with firms took place by telephone; its is projected that by 2003, 56% of contacts will be through a Web interface, 30% by e-mail, 9% across channels, and only 5% by telephone.[2] The Internet will eventually become ubiquitous and customers will practically never leave a digital interactive environment. The Gartner Group estimates that in ten years, time spent in e-interactions will exceed time spent in physical interactions by a factor of ten. Firms will have to urgently develop intelligent interfaces, effective customer-facing business processes, information integration, and routines for dealing with many varieties of customer contact.

Customer loyalty and long term customer relationships are major kinds of intangible assets (Fernández, Montes, and Vásquez, 2000; Tapscott, Ticoll, and Lowy, 2000). They are among the most difficult assets to develop and among the easiest to lose. They are at the top of many executives' lists of concerns about competitive advantage. Integrated enterprise applications, which absorbed such huge quantities of IT-related

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[2] CINCOM 2000, citing research results by Forrester Research and *Information Week*.

time and energy in many firms in the 1990s, addressed primarily bottom-line concerns by seeking to increase operational efficiencies. In contrast, CRM applications are intended to respond to many top-line (revenue growth) concerns. An American Management Association survey of executives' perceived e-business opportunities for 2000 found that "improvement of customer service and support", "gaining access to new customers", "enhancing brand awareness", and "creating new revenue sources" were the top four anticipated benefits of e-business enablement (AMA 2000). Other recent surveys confirm the apparently widespread belief among executives that the primary source of competitive advantage must be sought in the establishment and maintenance of appropriate relationships with customers and in the transformation of customer information into actionable knowledge.[3]

e-nabling CRM

Current CRM encompasses the range of Front Office functions: sales, marketing, and service delivery, including all business activities that have to do with customer content, contact information, interactions with customers at every point in the transaction cycle, and customer care throughout the extended enterprise: sales force automation, contact centers, service centers, help desks, customer interaction centers, product and price configuration software tools, and decision support tools. CRM therefore focuses on the entire cycle of customer recruitment, development, and retention, and integrates the disparate business processes and competencies that support customer acquisition, profitability enhancement, and identification and retention of profitable customers. This capability requires coordinated actions within the Front Office and between the Front and Back Office. Internet-enabled interactive interfaces and integrated applications throughout the Front Office are the two drivers of "e-nabled" CRM.

CRM currently has executive mindshare because in many businesses, customer service centers have become profit centers that are vital to the survival of the firm. In 1996, direct sales and marketing accounted for about 45% of business-to-business sales. As companies realize that "investing in state-of-the-art call center capabilities can be their single best competitive differentiator" (Sevcik and Forbath 1998), the market for CRM applications has grown quickly. Worth US$ 3.3 billion in 1999, the CRM applications market is expected to grow to US$ 12 billion by 2004 (Menzigian 2000).

Traditional Customer Relationship Management is a well-established field of business practice with roots in service management, the quality movement, and especially relationship marketing, which itself is an extension of traditional marketing (Bretherton 2000). The field possesses basic rules of thumb concerning lifetime customer profitability, cost of customer loss, ratio of profitable to unprofitable customers, communication behavior by dissatisfied customers, and effects of small increases of customer retention rates on company profitability.[4] These rules of thumb have been part of the

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[3] Mercer Marketplace 2000 Survey. The other factors of competitive advantage in declining importance are: agility, speed, innovativeness, quality, cost, investment in HR, relationship with suppliers, and brand image.
[4] See for example Anton (1996).

field's knowledge base for two or three decades. Traditional call centers, which have existed for several decades, also possess performance metrics and benchmarks, especially average time to live answer, time to voice response menu choices, and time queued for live answer.[5]

On the surface, the overall objectives and theoretical underpinnings of CRM are not controversial, and the most challenging parts of CRM are considered to be implementation and bringing theory to bear on practice. Practically every recent writer on managing customer relationships in interactive environments advocates the development of a "market of one" characterized by one-to-one customer centricity.[6] Technology-enabled CRM seeks to create a complex, intelligent, distributed, multi-channel interface for the firm and the customer to communicate with each other. The firm must capture and integrate all interactions with the customer in order to achieve "zero-loss learning" about the customer throughout the entire transaction cycle. In zero-loss learning, the firm develops a "360-degree view" of the customer and learns to create what the customer wants, to remember what the customer wants, to anticipate what the customer wants, and to change what the customer wants (Kelly 1998). This learning is intended to permit the establishment of a unique relationship between the firm and the customer, a relationship in which the firm provides singular value to the customer. The customer value paradigm, a core idea of marketing thought, posits that firms exist because they provide value to customers for whom it is neither efficient nor effective to create the value themselves. Competing views exist about the nature and characteristics of customer value.[7] It is clear, nevertheless, that in order to deliver value to customers on an ongoing basis, firms must be capable of discovering and fulfilling consumer needs with customized products and services, produced and delivered in real time by a network of firms in a "sense and respond" arrangement (Bradley and Nolan 1998; Haeckel 1999). The use of ICTs to support CRM generally has the following objectives: reducing customer service transaction costs through automation; selling more to existing customers; turning service requests into revenue opportunities; finding new customers by integrating sales and service delivery directly into marketing activities; maximizing customer retention; and increasing lifetime customer value (Silver 1998).

Financial services, banking, and telecommunications are the three industries that are leading CRM spending (Nelson 2000). However, firms regarded by industry observers as CRM practice leaders are distributed across industries. They display superior performance in the areas of smoothness and rapidity of contact management, mastery of metrics, ability to segment customers, ability to create and maintain trust, delivery of self-

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[5] See Anton (2000).
[6] For example: Peppers and Rogers 1997; Seybold 1998; Newell 2000; Gillmore 2000.
[7] Research has identified four types of customer value (Smith 2000): functional/instrumental value, which derives from performances and outcomes; experiential/hedonistic value, which is yielded by products and services that provide sensory, emotional, relational, or epistemic experiences; symbolic/expressive value, which is derived from products and services that provide personal or social meaning; and cost/sacrifice value, the features of products and services that make them easier or more convenient to use.

service functionality to customers, navigability, personalization, and online service quality.[8]

Because ICT-enabled CRM is a complex business practice that is based upon complex, rapidly evolving technologies, new organizational routines, new competencies, and unprecedented information-intensity, it is regarded a very challenging area of contemporary business practice. CRM projects reportedly have a high failure rate – by some accounts, 60% to 80% "fail to live up to expectations" and between 30% and 50% are regarded as "abject failures" (Adtrack 2000). The relatively high failure rate of CRM projects reflects the steepness of the CRM learning curve. It suggests that significant improvement of productivity in the Front Office may take years of investment and experimentation in the creation of new business processes in a new orgnaizational and technological environment. Managing virtual customers through CRM possesses several similarities with other cases in which firms have had to learn to use complex IT-based systems to produce value (ERP systems are a good example). In this sense, IT-enabled CRM may be regarded as a familiar "people-process-technology" business problem, although by most accounts the technological issues in CRM are more tractable than the "people" and "process" issues. More precisely, managing virtual customers requires development of three sets of competencies within the firm: ability to select and master complex technology tools, ability to develop and maintain a customer-centric organizational configuration, and the skills and wisdom to effectively manage information and knowledge within the customer relationship. The remainder of this paper briefly reviews the management challenges arising from these new areas of technology-enabled, knowledge-intensive business practice.

Selecting and mastering complex technology tools

CRM is presently transitioning from stand-alone service and sales operations supported by proprietary hardware platforms and software applications to integrated, multimedia, multichannel operations supported by standard hardware platforms and packaged software solutions. Frequently this involves the web-enablement of a call center and its evolution into a virtual customer contact center.[9] In terms of functionality, it implies a traditional emphasis on management of customer information as well as a newer emphasis on management of customer interactions. Ultimately, it involves customer-centric reconfiguration of the firm.

The nomenclature of CRM can be confusing. Vendors with web-enabled CRM applications sometimes refer to them as eCRM applications. Other acronyms that refer to CRM are Enterprise Relationship Management (ERM) and Technology-Enabled Relationship Management (TERM). The historical core of CRM was a group of employee-facing technologies to support sales and customer service. More recent groups of applications

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[8] For two recent surveys see ZDNet 2000 and Blodgett 2000.
[9] The principal virtual feature of these customer care centers is the routing of calls to agents who are outside the operational facility, either to provide second-tier support for complex products from experts in engineering groups, or to provide low-cost occasional support by contingent workers or subcontractors.

provide services to customers and partners: Partnership Relationship Management (PRM), e-service, and e-sales. A fifth component, a knowledge/analytic infrastructure, supports personalization, knowledge exchange, and analysis (Selland 2000).

The core functionality of a CRM product is its ability to maintain a single, coherent view of the customer for the customer-facing functions of sales, service and marketing. The product must support sales processes, opportunity management and pipeline management through forecasting, sales territory management, and team-selling, and provide sales productivity tools such as sales configuration and quote generation. The product must support marketing campaign management and prospect generation. Finally, the product must have the ability to support a customer service operation, including capability to record interaction with the customer and to provide differentiated service, tiered support operations, self-service, and Web-based services. The building blocks of customer contact centers are:

- computer-telephony integration, usually to provide "screen pops" displaying customer information to customer service representatives;
- CRM software;
- Enterprise Interaction Management (EIM) software to route messages to the best available agent, according to agent skills and business objectives;
- a variety of software-based business processes that are automated and provided with intelligence to analyze message content and provide automated answers, or to enable handling of multiple customers concurrently;
- a website providing self-service and self-help functionality, human-assisted help, automated interactive assistance, and customer contact history
- software tools to provide proactive support and cross-selling based on an understanding of the customer's needs;
- Internet-based communication channels (text conferencing, voice over IP, co-browsing and application sharing, e-mail, and videoconferencing), the mix depending on the capabilities of the customers;
- Emerging customer-to-firm communication channels such as handheld wireless applications or navigational systems (Genesys, 1998).

Construction of a complete CRM solution typically requires the involvement of software, hardware, services, and strategic business consulting firms. More than five hundred vendors are active in the CRM market, with hundreds more in the call center market. But few vendors can deliver a complete CRM solution. The two principal products are customer information platforms and customer interaction platforms. Moreover, the CRM landscape is characterized by a high rate of introduction of new software products that address specific aspects of CRM solutions to enable and optimize specific communication channels (for example, e-mail management and routing) or specific occupational activities (for example, for example, marketing automation or customer analysis). Many of these products are not yet incorporated into complete solutions and they can be very complex to integrate and implement.

Purchasers of CRM or call center solutions must assess, first and foremost, the reliability of the service providers and the viability of vendors in a market that is sure to consolidate. The evaluation of CRM solutions must consider the ability of the product to support each communication channel, especially the Web; how well the application works in multiple locations; how suitable it is for use in customer contact centers and by teleworkers; how well it synchronizes with commonly used messaging systems; the usability of each interface from the perspective of the user: marketing, sales, support, or customer; the product's likely effects on individual productivity; the ease and risks involved in customizing the product; the ease with which it can be integrated with other systems; and the reliability of the vendor.

The arrival on the market of integrated CRM suites is helping to reduce the complexity of CRM purchasing and implementation decisions, and the cost per seat of CRM solutions is expected to decline by a factor of ten in the next few years. However, the range of available solutions and add-on functionalities remain great, and system integration, data integration, and business process design and integration are major considerations in managing the technological transformation of the customer-facing parts of the firm. Noted Drury and Van Doren in a 1999 review of call center solutions, "nothing available today provides the level of integration and performance that will be mandatory in a few years" (p. 61). Moreover, as firms' call centers begin the migration toward multimedia customer contact centers, organizational and relationship issues gain a great deal of salience.

Customer-Centric Organizational Focus

Many firms have decided to develop a customer-centric focus; often this implies migration from a product-centric to a customer-centric organizational configuration. Half of the executives interviewed in a recent survey said their companies would organize around customer type by 2002, compared to 18% in 2000 (Manasco, Hopkins, and Lusher 2000). But the transition to a more customer-centric focus involves complex cultural and organizational challenges.[10]

Even in large firms, until the end of 1999 most CRM projects were relatively small initiatives (<$3M [Pétrissans 1999]) focusing on rapid implementation of capability to service existing customers through improvement of call centers, addition of Internet channels, and implementation of Front-Office solutions, with deeper and more extensive CRM capability slated for later phase-in. The highly localized, tactical nature of CRM implementation patterns to date contrasts sharply with the holistic, integrative, strategic objectives that most writers advocate for CRM enablement. The principal causes of failure of CRM projects are attributed to a range of strategic and operational deficiencies: inadequate strategic focus, weak conceptualization, insufficient executive commitment to redesign sales processes, treatment of CRM initiatives as part time projects, attempting to use technology to automate conventional Front Office business

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[10] These are described in the literature on market-driven organizations; see Day (1999) and Haeckel (1999).

processes, insufficient budgetary resources, inadequate management of relationships with vendors, failure to secure user ownership of the new system, rolling out the system without proper prototyping and testing, and insufficient training of employees (Sims 2000).

The reportedly high rate of CRM projects failures is not surprising. Organizational innovation to harness advanced CRM systems involves new configurations of human-computer interaction that must be understood and effectively managed if the transformation to interactive business is to succeed. The repertoire of Front Office business processes and organizational routines has a variability and variety not found in most other parts of the firm, and so "automation" does not well describe the context, issues, and processes of integrated IT deployment in this part of the firm. The customer-facing part of the firm is necessarily complex because of the variety of interfaces with a range of external users and because of internal task variety. Using some combination of human and machine intelligence, it must properly interact with the external user and trigger the performance of tasks, some of which can be performed by machines while others have cognitive content that can only be delivered by humans.

The organization's customer-facing routines and business processes must be more variable than in previous generations of IT-enabled business transformation. Inevitably, the experience of IT deployment in the Front Office is compared to the experience of IT application in the Back Office, where usually adoption of integrated ERP systems has required that organizations learn to function with business processes that were selected and configured from among those provided in the software by the vendor. Front Office software allows for a much higher degree of configurability and customization of business processes than ERP software, practically obliging firms to redesign business processes and routines during configuration (Fisher 1998). Thus, the organizational impacts of such Front Office software applications such as Sales Force Automation (SFA) are complex and unpredictable because "even the most basic system does more than simply automate existing tasks" (Rivers and Dart 1999). The business processes, organizational routines, configurations of technology platforms, and management practices of customer-facing parts of the firm are not highly standardized across firms. The Front Office must be capable of flexibly configuring automated and human intelligence and deploying human empathy to provide the right combination of automation, customer self-service, remote and local direct contact with a live representative, and peer-to-peer communication among customers. The IT-enablement of the Front Office therefore requires a large degree of firm-specific customization, involving relatively greater investment in learning than would be the case in the adoption of standardized organizational templates and business processes.

Service work is the fastest-growing occupational sector, and the "customer care" process is central to it. Customer-facing work is of strategic importance because it represents the interface between the firm and the customer. Frequently it is a source of revenue generation and observations and insights that are crucial for product innovation (Frenkel et al. 1999). The infusion of advanced CRM tools into the Front Office has profound effects on the organization of work and the characteristics of jobs in this part

of the firm. Front-office (or front-line) work is unlike work in production or in the Back Office. It is traditionally people-oriented, and because front-line workers must constantly interact with customers, their work is not completely scripted. Front Office workers have some discretion to vary their behavior in accordance with customer needs. There is a positive and a negative aspect to this discretion. The positive aspect is the enjoyableness of the relative task variety and the social interaction. The negative aspect is the expectation that the worker present an empathic persona to the customer even when the worker may not feel like it. This is why writers on customer-facing work have sometimes said that it consists of "acting" to provide "emotional labor" on the "stage" of the firm. Even in fairly highly routinized face-to-face service work settings, workers are recruited partly on the basis of their ability to empathize with customers; in sales workflows, ability to provide empathy is of important instrumental value (Frenkel et al. 1999). Empathy is one of the interactional competencies of customer-facing workers that is not satisfactorily substituted for by technology, no matter how interactive or rich the media are. Hughes et al. (1999) have shown that successful adoption of new IT tools in customer-facing work owes much to "the skilful adaptation of pre-existing interactional competencies such as those embodied in things like demeanour work, handling the unpredictable, and the relevant use of local knowledge". This is not unlike examples of workers' use of prior craft skills in the process of organizational adoption and adaptation of new IT tools that Zuboff (1988) and others have observed.

More than 60,000 call centers exist in the United States alone. Call centers have proliferated in response to the increasing complexity of the customer environment. Most have followed a cost-minimizing, high-throughput business model that contradicts the ostensible strategic value provided by customer care. Firms say that they want agents who can exercise critical judgment when responding to customers, and it can take between 6 and 10 months for call center agents to become proficient. However, the average job tenure is less than two years: call center work is said to be among the ten most stressful occupations. The high rate of turnover of call center agents is attributable to the relatively low remuneration and truncated career progression that call centers offer, stress from work intensity, the concentrated handling of complaints and problems, conflict between work schedule and social life, and the surveillance performed by management for performance purposes. However, it is not difficult to make a business case for relationship-oriented call centers, and accounts of competition for workers in the call center industry suggest that improvement in working conditions in these institutions may be occurring.

Mass customization of products is becoming standard business practice in manufacturing. Mass customization capability can be characterized by the point in the production cycle at which customers become involved in providing product specifications, and the type of product modularity employed by the manufacturer: earlier customer involvement and finer-grained product modularity are deeper forms of customization (Duray et al. 2000).

An analogous issue exists in the service sector. Internetworked computing radically increases the scope, frequency, and volume of customer interactions with firms, requiring flexible customization of the firm's responses. Configurations of IT-supported services clearly involve tradeoffs between a structure that embraces all possible diversity among customers and the firm's needs for efficiency and speed in task performance. Buzacott (2000) has proposed a structure for mass customization of services based on Ashby's Law of Requisite Variety that can cope with the uncertainty about timing and level of customer demands and the range and complexity of customer requirements. The two dimensions of the taxonomy of service responses are the range and complexity of customer demands, and the complexity of the response system. The middle range is where responses are neither too simple nor too complex.

Service firms can be classified in terms of the degree of routinization of their processes and the degree of integration of business processes and service delivery (Davis 1999). The mix of low cost, automated services and high cost personalized services is traditionally part of the strategic determination of how a firm chooses to compete. This is no longer a simple high-tech versus high-touch tradeoff because, as Evans and Wurster have shown in *Blown to Bits* (2000), the connectivity explosion pushes the envelope of the richness-reach tradeoff and allows new levels of richness and reach to be attained. Effective high-touch services for virtual customers require high-tech enablement. Routine services can be automated and placed in the Back Office, although recent research suggests that some service firms that emphasize personalized relationships rather than efficiency choose not to minimize human contact with the Front Office.

Informating customers' interactions: managing information and knowledge in support of customer relationships

It is complex to leverage and produce business value from customer virtualness because the information, communication, transaction, and distribution spaces must be effective, efficient, congruent with the firm's strategic goals, and satisfying to the customer. The CRM community is at the beginning of its learning curve regarding the ways that differences in service organizations require different strategies in the configuration and management of interactive customer interfaces. Although customer-facing innovation involves much organizational design freedom, significant constraints are imposed by customers' habits, expectations, preferences, capabilities, and beliefs. Many of these factors are misunderstood or ignored by firms, as attested by abundant reports of disappointing encounters between customers and firms' websites.

The development of an interactive relationship between a firm and a customer also raises an old issue about the distribution of costs and benefits of applications of IT to the production system that was previously mainly confined to work situations. Zuboff (1988) points out that while automation of processes provides efficiencies within organizations, a more significant outcome of applications of information technology in organizations is "informating": the collection of data of about organizational processes and systems. This data is used to monitor and modify IT-enabled business processes. Automating removes human intervention from a business process, and informating re-

stores it. Informating represents a discontinuity in the application of machines to work, a reversal of the simplifying effects of automation. Informating generates streams of data about organizational and production activities that must be analyzed and understood, making work processes more dependent on abstract knowledge. Zuboff's insight about informating occurred just as ubiquitous internetworked computing began informating to routinely produce terabytes of data in firms.

Many of the complexities of managing relationships with "virtual" customers are crystallized in the "informating" of customer interactions. Live or automated computer-mediated interactions with customers produce enormous volumes of "data exhaust" that are stockpiled in data warehouses and mined for insights.

Viewed from the firm, "virtual customers" are data constructions that represent types of customers and their use of the firm's products, their spending history, and records of contact between the firm and the customer. The result is the "Quantified Customer" or the "customer in the machine" who is described in terms of a "calculable space" (Vaivio 1999). The picture of the customer so constructed is used by the firm as a reference point by employees in interactions with the customer, and simplified models of customers are developed to provide behavioral scripts for the firm vis-à-vis the customer or segments of customers. In principle, the finer the segmentation, the closer the data picture approximates the individual customer, and the more accurately and appropriately the firm's routines can be scripted. Profiles can also be constructed by aggregating customer information across databases or websites, as the targeted banner advertising firm DoubleClick does in conjunction with partners in the Abacus Alliance.

Informating customer interactions has different implications for employees, customers, and firms. For employees, informating customer interactions implies that tacit knowledge about customers gained from personal interactions declines in importance in the firm's customer knowledge base, and therefore plays a declining role in the firm's construction of the customer's profile, its definition and interpretation of the customer's segment, and its behavioral scripting for dealing with the customer and the customer's segment. Employees may complement or contest the data picture with tacit knowledge gained from interaction and observation, but codified knowledge about customers thus plays an increasingly important role in these areas. In financial services firms, one of the first industries to develop customer profiling capability, profile-based behavioral scripting about credit eligibility removed most of the need for contextual judgment from loan officers. Employees' new tacit knowledge develops around the use of codified customer information and information tools in planning and executing interactions with customers. Firms are looking for ways to encourage employees with tacit knowledge of customers (for example, field sales representatives) to fully share this knowledge with others in the firm. Employees must decide how much time and effort they can afford to spend inputting such information into a system, and the system design will determine how easily this information can be manipulated and interpreted.

For customers, the informating of interactions with firms can bring convenience or intrusiveness of varying degrees of seriousness. The convenience comes when a vendor remembers a customer's password, clothing size, birthday, travel preferences, etc. The intrusiveness comes when vendors traffic in customers' information, disclose private information to third parties, or fail to enforce data security. Consumers are deeply concerned about the privacy of their online personal information. A 1999 survey in the United States found that eighty-seven percent of respondents who were experienced Internet users were somewhat or very concerned about online threats to their privacy (Cranor, Reagle, and Ackerman, 1999). Consumers specifically object to "automatic data transfer" or informating and unsolicited communications. Consumers remain uncomfortable about providing personal information to businesses online. This distrust is regarded as one of the principal reasons that consumers use the Internet to gather information about a product or service and then purchase offline.

Informating customer interactions underscores the potential commercial or political or law enforcement value of information about the customer. A number of software tools such as cookie blockers, advertisement filters, anonymizers, site excluders, web bug detectors, and third party proxy sites are available to consumers to preserve anonymity or prevent web marketers from surreptitiously collecting this information.

But the larger business issue is how and why and with whom individuals exchange information in ubiquitous interactive environments. Popular scenarios of future digital life such as Nicholas Negroponte's *Being Digital* depict individuals with personal software robots that filter and dispatch messages, order dinner, check on the kids, buy and sell stocks, negotiate meeting times, and monitor the master's health. The data exhaust generated by exponentially increasing interactivity will be enormous. Hagel and Singer in their bestselling *Net Worth* emphasize the economic value of personal information and argue that an emerging need exists for trustworthy "infomediaries" to broker personal information on behalf of the owner. In fact, a number of infomediary initiatives have already been launched, including W3C's Platform for Privacy Preferences (P3P) project, Novell's digitalme, the Open Profiling Standard project, and several infomediary startups such as Lumeria, which constructs a "SuperProfile" of each participant - a copyrighted private collection of information owned and controlled by the participant that can be exchanged for offers by marketers.

The customer data issue is linked to several unresolved questions about privacy rights, customer knowledge and consumer behavior that could determine the future directions of CRM. In the first place, consumer data are important information assets. What are the rules of engagement in the development of a market for these assets? How should the market for personal information be organized? Legally enforceable privacy rights would seem to be a necessary condition to create consumer confidence in a personal data market. Trust is the foundation of relationships and is required to some degree in even the most perfunctory of transactions. Trust is regarded as a form of social capital, along with gratitude, respect, shared understanding, and friendship. Consumers, when they make an online purchase, must assume almost entirely on the basis of trust that the information provided on the website is accurate, that any personal informa-

tion provided will be held in confidence, and that products ordered will be delivered (Urban, Sultan, and Qualls, 2000).

Processes of trust formation, perception of quality, and customer satisfaction in interactive environments are not well understood at present. Many unanswered questions remain regarding relationships between service quality and profitability, the offensive and defensive effects of service quality, relationships between service quality and customer behavioral intentions, and the impacts on the firm of selecting profitable customers (Zeithaml 2000). Furthermore, development of customer equity (manifested as customer loyalty) requires the creation of a sense of fair treatment in the customer. Personalization and customization techniques, however, offer firms attractive opportunities to practice price discrimination, thereby effectively raising the customer's costs of loyalty.

Ubiquitous interactivity means that individuals interacting among themselves or in communities through peer-to-peer computing will create huge volumes of data exhaust signaling new needs and new market opportunities. Firms that are privileged enough to have access to these communication networks and the data in them will be able to evolve along with their customers and will find themselves in an accelerated learning situation with customers as their teachers. Says Kelly (1998), "In reward for the firm's effort at being taught, the firm and the customer develop a committed relationship" because the firm will be able to deliver singular value to customers. One consequence is that "whoever has the smartest customers wins" because as customers form affinity groups and communicate with each other, the best product expertise lies with the most experienced customers.

Conclusion

This paper has discussed the transformation of the business practice of Customer Relationship Management as firm-customer interactivity accelerates and becomes commonplace. Successful management of virtual customers is the key to accumulation of customer equity. In some respects firms' experiences in bringing advanced information and communication technologies to bear on matters of customer relationship management resemble the learning and innovation they expended when mastering supply chain or integrated enterprise application software. However, in many other respects the new hyper-interactive CRM raises new challenges. Of these, the properly technological challenges, while considerable, are not the most difficult. The internal organizational challenges involved in becoming customer-centric are considerable, and the larger issues of how to bring value to customers in a highly interactive-intensive environment are central strategic and operational issues that will shape the evolution of business in coming years.

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