customer data collection and analysis: how do firms develop competence in customer intelligence management?

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Executive Summary

Customer Intelligence Management (CrIM) is a member of the intelligence management family, sharing a variety concerns and practices with business intelligence (BI) and competitive intelligence (CI). Its origins can be traced to practices of customer relationship management and marketing and advertising science. It is especially associated with Customer Relationship Management and its purpose is to support the development and deployment of effective customer knowledge management. CrIM focuses primarily on the interactions between the firm and its customers. Data from these interactions are supplemented by remote observation of potential customers and internal metrics provided by the firm's reporting business intelligence systems. Customer intelligence is increasingly embedded in the customer interface to support service workers or automate responses to customers. Technology selection and implementation and business process design are thus critical issues in CrIM. Since many actors within the firm have requirements for customer information and customer knowledge competence, users of CrIM solutions range from analysts to customer support personnel. In effect, the greater the integration of CrIM capability in the firm, the greater the range of users will be. For this reason CrIM effectiveness is sensitive to a greater number of factors than other forms of intelligence management.

Introduction

Customer intelligence management (in this chapter called CrIM) is a domain of practices and tools belonging to the family of business intelligence (BI) and particularly associated with Customer Relationship Management (CRM). It shares with BI and competitive intelligence (CI) practices the cyclical business process of planning, data collection, analysis, dissemination, and use. Like BI and CI management practices, its quality and utility are determined by data quality, analytical acumen, and effectiveness of organizational processes. Customer intelligence and BI/CI management both increasingly rely on complex observational and analytical techniques and data manipulation and visualization technologies that can be difficult to master.

Customer intelligence management "focuses on gathering and analyzing information about customers to deliver a better customer experience and to increase customer yield" (Harvey, 2000a). CrIM is a proactive, IT-enabled, outward-looking form of customer knowledge management. It is becoming a necessary competence as firms endeavor to move from product-oriented to customer-oriented business models and as customer relationships increasingly take place via electronic channels.

This chapter contributes to current discussions about effective customer intelligence management by identifying and analyzing the issues and challenges it raises as firms endeavor to develop competence in it. The complexity of the customer environment is already significant and is set to increase exponentially. Customers have become virtual – they are everywhere and nowhere, communicating for various motives with different units within the firm through a proliferating set of channels. In order to know who they're dealing with, for what reason, and with what strategic and tactical goals in view, firms have to assemble the information puzzle – increasingly, in real time. But the tools and technological solutions that make this kind of coherent integrated interaction possible are complex and volatile, and therefore risky. Selection of technology and affiliation with its vendor require lots of consideration. Further-

more, these technologies do not plug and play well. They usually require organizational and business process reconfiguration that is complex to implement and learn. But since there's no simple alternative in the journey toward technology-enabled customer-centricity, firms must manage the new forms of technological and business learning as best they can.

Customer intelligence in the framework of business/competitive intelligence

Customer intelligence management differs from business and competitive intelligence practice in four important respects. In the first place, its pedigree is different: its origins are in craft practices of customer relationship management, marketing and advertising science, and more recently in IT-supported business process automation in front-office environments. Contemporary CrIM practice and its underlying tools and technologies are a recent innovation in a long line of "market feedback technologies" developed to control and manage processes of mass consumption (Beniger, 1986).

Second, observation at a distance is not the principal feature of customer intelligence management. Instead, CrIM is grounded in data generated when the firm interacts, communicates, and transacts with customers. Firm-customer relationships are "informated" (Zuboff, 1988) and IT-supported feed-forward loops provide the data as inputs to decision making.

Third, the theoretical underpinnings of contemporary customer intelligence management practice have come largely from the Customer Relationship Management (CRM) movement, which has developed a simple, clear foundation paradigm with no equivalent in the BI or CI communities. Most writers on managing customer relationships in interactive environments advocate the development of a "market of one" characterized by one-to-one customer centricity (i.e. Peppers and Rogers, 1997; Seybold, 2001; Newell, 2000; Gillmore and Pine, 2000; Liautaud, 2001). The goal of the firm is to achieve "zero-loss learning" about the customer across all interactions. To do so, the firm must develop a "360-degree view" of the customer and learn 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, 1999). On the basis of this learning the firm establishes a unique relationship with the customer, provides singular value that differentiates the firm in a crowded marketplace, and produces satisfaction. A variety of IT tools are employed to support relationships with customers: by reducing customer service transaction costs through automation; by enabling upselling and cross-selling; by finding new customers through integration of sales and service delivery directly into marketing activities; by maximizing customer retention; and by increasing lifetime customer value. At the same time, armed with intelligence about its customers, the firm distinguishes among them on the basis of their anticipated value. Metrics enabled by customer intelligence technologies are used to measure the profitability of customers, products, services, marketing initiatives, and advertisements. The firm offers premium services to premium customers and downgrades, deflects, or de-markets unprofitable customers.

Fourth, customer intelligence management is no longer a purely human activity. Firm-customer relationships are increasingly mediated by information and communication technologies. As this happens, economics and strategy converge to embed intelligence in the customer interface for use in supporting front-office workers and triggering business routines and workflows. This is nowhere clearer than in emerging multimedia customer contact centers. The automation of some business routines is a critically important factor in high quality service delivery. But not all customers want automated or self-service all the time. Nor does the firm want to lose opportunities to brand or personalize its relationships with its most profitable customers. It certainly does not want to spend valuable service personnel time on unprofitable customers. Customer intelligence plays a strategic role in the selection of the right mix of human, automated, and self-administered services offered by a firm, and a critical functional role in triggering the right response at the right moment.

Complexity of customer environments

The complexity of the customer environment is increasingly rapidly. Ever finer distinctions can be made among customers in order to characterize them, and electronic touch points, indirect channels, and products are proliferating. Firm-customer interactions are distributed in space and time throughout the transaction cycle, and firms and customers experience each other as virtual actors: 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, they maintain a range of relationships, many of them of a temporary nature (Davis, 2001).

Customers can be characterized by many kinds of economic, demographic, sociographic, or psychographic features. The profitability and net potential profitability of the customer are, of course, key metrics. The firm must be able to identify the customer on contact and detect his/her significant characteristics, enabling the call-up of routines that target, question, interact, propose, and inform (Jutla et al., 2001).

The customer's needs for information and communication differ according to the moment in the customer transaction cycle. Most frameworks recognize four to six steps, such as need identification, location of source, negotiation of terms, and use-maintenance-disposal of the product (Bloch et al., 1996). Each step has its own business logic and each one typically involves interaction with the firm through a different touch point and channel.

The location of the customer's interlocutor within the value network varies according to the moment of the transaction cycle (as when the customer interacts sequentially with marketing, sales, or service). The interlocutors may be within a single firm in one geographic location, within a single firm in several geographic locations, or within several related firms within a value delivery network (alliance partners, franchisees)

depending on how the value network is organized. Information from each interaction must be captured, stored, and retrieved at the right moment.

Touch points are the mechanisms through which firms and customers communicate with each other. Interactive IT-mediated touch points are proliferating. They include telephone, web, fax, kiosk, e-mail, face-to-face, paper, chat, VoIP, PDA, ATM, POS, credit card, smart card, and the coming explosion of networked devices in smart products and smart environments. The proliferation of touch points is radically increasing interactivity between firms and customers. Soon, contacts between customers and firms that do *not* take place through electronic channels and interfaces will either be quaint anachronisms or expressions of very high-value-added business relationships.

Channels are the ways that firms go to market or the "business relationships set up by companies to make it easier to get products, services, and information to their customers" (Seybold, 2001: 171). Channels are either direct or indirect. They range from low-touch to high-touch and lower-cost to higher-cost: the Internet, telemarketing, retail stores, distributors, value-added partners, and sales forces.

New products are proliferating, especially in the consumer sector. The number of new consumer packaged goods products introduced annually doubled to 24,000 between 1987 and 1997. The number of products carried by grocery stores grew from 3,000 in the 1950s to 30,000 today. This proliferation arises from advances in manufacturing, which allow increases in the variety of products without increasing unit production costs. Flexible manufacturing capability has allowed an expansion of product variety far beyond what the market needs, increasing the pressures for performance improvements in advertising, marketing, and sales. Mass customization technologies relying on accurate customer intelligence are a solution to product proliferation as well as a cause of it.

A simple measure of the complexity of the customer environment from a relationship management perspective consists of multiplying together the number of customers, characteristics tracked, moments in the transaction cycle, touch points, channels, locations, and products. For example, the customer environment complexity factor throughout the transaction cycle for even a relatively small firm with only 1,000 customers, ten products, five channels, ten touch points, five locations, and ten categories of customer characteristics is 25 million. Of course, these 25 million units of interaction are not of equal business significance nor do they occur with equal frequency. Their optimization would improve the firm's efficiency *and* its effectiveness, the competitive position with the lowest cost production of the most value.[1]

The amount of information that the environment produces increases its complexity. Internetworked communication is expected to become so ubiquitous that customers will practically never leave a digital interactive environment. Data will be produced by ubiquitous interactions in staggering quantities. To compete in this kind of information- and communication-intensive customer environment, firms will need to have intelligent interfaces, effective customer-facing business processes, integrated information, and routines for dealing with many varieties of customer contact.

The customer intelligence industry and the solutions it provides

Business intelligence (BI) systems "are defined by the collection of decision support systems, case-based reasoning systems, and contextual information retrieval systems which provide the needed historical base from past experience that help make decisions rapidly and accurately" (Tiwana, 2001). The (BI) industry emerged to provide analytical tools and services to firms needing to understand their internal functioning. These tools include data warehouses, data mining, document management systems, a variety of artificial intelligence tools (Tiwana, 2001). BI systems are extending their reach from their historical origins in executive information systems and decision sup-

[1] Hunt and Duhan (2002).

port systems to play enhanced roles in analysis of corporate data, personalized corporate information portals, groupware, and e-commerce analytics (Kara, 2000).

Customer intelligence solutions are BI solutions specifically intended to support customer knowledge management processes. These processes are being transformed and made more complex by rapid development and deployment of software-based customer intelligence applications that generate or collect data, transform it into information, organize it for users, permit analysis and exploration of it, and in some cases feed forward to guide the firm's response to the customer. Customer relationship management (CRM) is the principal area of analytic application of business intelligence solutions at present (Tanler, 2001). CRM solutions typically include applications for sales force automation, marketing automation, service support, and analytics. Frequently vendors of business intelligence solutions or CRM software vendors supply customer intelligence solutions as well. Interactive marketing companies and vendors of Web usage data are also active in the customer intelligence space, adding analytical capability to their products and partnering with traditional BI solutions vendors.

A typology of the customer intelligence industry is shown in Table 1. It is based on about seventy firms operating in the customer intelligence space (i.e. identifiable with the search term "customer intelligence") in mid 2001. About fifteen of these firms provide relatively integrated suites and platforms for customer intelligence management. The others provide products and services for data capture, analytics, systems integration, hosted solutions, navigation, content management, competitor and market intelligence, customer behavior intelligence, and management consulting.

The overall market for business intelligence tools is projected to reach five to six billion dollars by 2002-2003 (Kara, 2000). No reliable estimates of the size of the customer intelligence industry are available. However, customer intelligence is quite small compared to knowledge management, customer relationship management, or business intelligence, representing less than 1.5% of the space occupied by these do-

mains as measured by frequency of word use on web pages.[2] However, we have seen that an overlap exists among the BI, CRM, and CrIM domains. Hundreds of firms that have not explicitly identified themselves as customer intelligence product or service providers are providing specialized products or services in neighboring areas such as customer relationship management analytics, business intelligence, database marketing, data mining, personalization, and knowledge management. Many of these firms could add a customer intelligence label and move into the customer intelligence segment, or bring customer intelligence functions or technologies into their own products and services if they so choose. The customer intelligence solutions industry could become larger and more complex as it expands to meet firms' needs regarding CRM and management of interactive customer interfaces, management of business network-based intelligence (Sawhney and Parikh, 2001), and contextual marketing (Kenny and Marshall, 2001).

Customer Intelligence Management Issues

Knowledge about effective business practices in the area of customer intelligence management resides largely in the hands of practitioners who are not a homogeneous group of people. A modest research and trade literature on customer intelligence management is available, often in the context of analyses of CRM or customer knowledge management. The following section reviews customer intelligence management issues.

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[2] The current saliency of customer intelligence compared to adjoining areas can be gauged from the number of pages on the Web, as measured by Google, containing specific search terms: "customer intelligence" (6,870 pages), "customer knowledge" (11,300), "customer knowledge management" (540), "business intelligence" (473,000) "business intelligence solutions" (24,500), "data mining" (331,00), "data mining solutions" (3,310), "customer relationship management" (518,000), "CRM solutions" (44,400), "knowledge management" (691,000), "knowledge management solutions" (20,200), "database marketing" (72,100), and "database marketing solutions" (724) *[in July, 2001].*

As mentioned earlier, the purpose of customer intelligence practices is to improve and support customer knowledge management. Customer knowledge management practices precede the recent widespread growth in interest in knowledge management, CRM, or CrIM. Practitioners have developed a "model for focused, high-payback knowledge management in many of their organizations" in which "knowledge capture, sharing, and reuse have become widespread and common-place within customer support organizations" (Davenport and Klahr, 1998). Knowledge management practices applied to customer support have enabled these firms "to become more productive and allowed them to get closer to their customers. The high costs of support have … been reduced, and solutions to complex support problems are already at least partially implemented" (ibid.).

Four generic customer intelligence management strategies exist: market focus, collaboration, experimentation, and repetitive experience (Slater and Narver, 2000). A *market focus strategy* uses information about customer's expressed and latent needs and competitors' capabilities and strategies. It enables the business to develop strong relationships with key customers and provides insights into opportunities for market development. Techniques used are focus groups, market surveys, benchmarking, and visits or close work with lead customers. A *collaboration strategy* generates customer intelligence within a network of organizations (e.g. alliances with suppliers) and disseminates the intelligence throughout the network. An *experimentation strategy* generates customer intelligence by trying out ideas about how to create superior customer value with novel products or processes that are not part of the organization's normal routines. Finally, customer intelligence is generated from *repetitive experience* (routines) when there is a conscious and sustained effort to understand the nature of the business process and to identify opportunities for improvement. Firms are advised to use a mix of customer intelligence generation strategies because each strategy contributes differently to value generation (ibid.). Practices associated with market-focused generation of customer intelligence, which identify customer's expressed and latent needs, are positively associated with superior sales growth, while collaborative customer intelligence strategies contribute to product quality, ex-

perimentation strategies contribute to new product success, and production process improvement through repetitive experience contributes to customer satisfaction.[3]

The effectiveness of each of these strategies stands to be vastly enhanced by the learnings generated by use of business and customer intelligence technologies and management practices. Most normative accounts of intelligence processes emphasize stages such as planning, collecting, analyzing, and disseminating (Kahaner 1996). It is possible to identify specific customer intelligence management practices and processes, but it is not yet possible to identify best practices (Davenport, Harris, and Kohli, 2001). However, firms that have implemented customer-centric business processes appear to be the best positioned to develop effective customer intelligence management processes (Davenport et al., 2001).

Managing complexity requires ability to produce understanding from *deep* analysis as well as ability to make sense of relationships *among* a broad range of apparently unrelated factors (Wang and von Tunzelmann, 2000). Customer intelligence must provide analysis that is "multi-faceted" and also "broad and deep" (Davenport and Klahr, 1998). Best practice in intelligence management is beginning to emphasize ability to accurately predict behavior of actors and systems. This requires modeling and simulation capability (Powell and Bradford, 2000). Modeling and simulation capability is also critical to the development of intelligent customer interaction systems, which automate some interactions and provide intelligent support to human operators for other interactions. IT-supported intelligent systems make "industrialized intimacy" (Kolesar, Van Ryzin, and Cutler, 1998) or mass customized service automation possible, simultaneously offering lower costs and increased service quality and convenience.

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[3] Slater and Narver (2000), with reference to firms in the electronics industry.

Firms face four major challenges when they attempt to leverage their customer information for intelligence purposes.

The first challenge is to find value in accumulated data. Many firms have accumulated massive amounts of transactional data through enterprise, CRM, point-of-sale, and e-commerce systems. These data can be analyzed for discovery of patterns or monitoring of metrics (Murphy, Hofacker, and Bennett, 2001; Sforna, 2000; Swift, 2001). However, most firms do not have the technological infrastructure or human analytical capability to turn their data into knowledge. Most firms are able to use only a very small percentage of their accumulated customer data (Davenport et al., 2001).

The second challenge is that the transactional data collected automatically by IT-enabled business processes is not appropriate data for many purposes of customer knowledge management. Davenport, Harris, and Kohli (2001) distinguish between "transaction data" and "human data". The latter is tacit knowledge possessed by sales and service personnel and customers. Its formal extraction is costly and its manipulation with IT tools is still cumbersome. Yet it potentially provides the most insightful knowledge about how customers think and feel. Firms must develop capability to manage customer intelligence based on tacit as well as explicit data. Davenport, Harris, and Kohli (2001) recommend a hybrid knowledge management strategy in which both types of data are valued.

The third challenge is the lack of data integration regarding customer interactions across all touchpoints and throughout the entire transaction cycle. This integration is required if the firm's relationship with the customer is to reflect and take into account the customer's entire experience. However, practically no firms have integrated all their transaction data, let alone their human data. In other words, "the fully integrated customer-knowledge environment seems to be more of an intriguing idea than a practical reality" (Davenport et al., 2001: 67). Until data integration be-

comes practical, "firms need to pursue multiple types of customer information" and live with separate databases (ibid.).

The fourth challenge is that to develop customer knowledge competence, CRM systems have to be used as more than devices for data collection and analysis (Campbell, 2001). Instead, ways have to be found to use the technology to learn from customer interactions and translate these learnings into improvements in overall efficiency and effectiveness. Too often, firms invest in technology without making the larger and more complex investments in development of business processes that allow the firm to exploit the technology. Managers of firms adopting CRM systems recognize that these systems do not automatically build customer loyalty but in practice they rely "on CRM technology to replace sound business practices" (ibid.). Firms need to understand the factors and variables that can be manipulated to create an enabling environment for adoption of complex IT tools. For example, sales force automation (SFA) systems implementations frequently fail, depriving the firm of the abundance of information about customers and competitors that salespeople accumulate. Successful implementation requires "training, encouragement, facilitative leadership, and organizational support" and cultural change management to create shared values including "customer orientation, adaptive cultural norms, information-sharing norms, entrepreneurial values, and trust among organizational members" (Pullig, Maxham, and Hair, 2002).

The selection of CrIM solutions and vendors presents risk. Typically, before a dominant design emerges to provide some stability and uniformity, a new industry is full of fragmentary, incompatible, and ephemeral solutions, and standard reference business practices are unavailable. The level of uncertainty and risk is therefore relatively high. CRM is currently "a swamp – a complete morass of technologies and business practices that many people (including analysts) find confusing" (Harvey, 2000c). Customer intelligence is just as unsettled: "the number of solutions, buzzwords, and approaches change as often as you blink" (ibid.). Business users of CRM and CrIM solutions have become skeptical about "the fantasy of providing a 360-degree customer

view and marketing hype about being the leader in 'e-CRM'" (Smith, 2001). Moreover, the present business downturn is forcing consolidation of the customer intelligence industry. The advice of an industry observer to potential users: "only acquire software that is absolutely necessary" (ibid.)

Harvey (2000b) provides an evaluation framework for customer intelligence technology solutions. It poses questions concerning the technical characteristics and functionality of customer intelligence solutions with respect to gathering, storing, and accessing customer information, building customer profiles and segmentation models, reporting, online data modeling and analysis, and generation of business rules. It also provides guidelines regarding pricing, the reliability of the solution provider, and compatibility of the solution with CRM solutions.

More research is required to better understand the circumstances under which customer intelligence is used within the firm. Analysts, product development teams, senior managers, marketing and sales teams, and front-line service personnel are all users of customer intelligence. When customer intelligence is embedded in the customer interface, customers are users of it as well. Furthermore, IT groups are not users of CrIM systems but their involvement in the selection and implementation of solutions is crucial. The organizationally distributed features of customer intelligence system design, deployment, and use make adoption of of integrated CrIM systems that much more complex.

CrIM raises several unresolved questions about proper use of customer knowledge that could determine the future directions of information-based CRM. Customer data is potentially valuable. Trust, the foundation of relationships, is required to some degree even in perfunctory transactions. What are the rules of engagement in the development of a market for customer intelligence? How should the market for personal information be organized? Permission-based intelligence gathering is not part of normal military or business intelligence practice and so intelligence tools and management paradigms imported from these realms have little to contribute in this respect.

Legally enforceable privacy rights may be a necessary condition to create consumer confidence in a personal data market. Moreover, much of the discussion about ownership and proper use of customer intelligence assumes that invasiveness would be the primary form of abuse. However, the potential for exclusion through "demarketing" or denial of service, based upon an evaluation of the potential profitability of the customer, also raises thorny policy issues.

Conclusions

The outlines of emerging customer intelligence management practice are visible today. They point to a business discipline that is becoming tremendously important. Customer intelligence management is a form of technology-based competition with its own mix of risks and rewards. Like other new fields, customer intelligence management is unsettled, with uncertain rules, volatile technologies, and unproven practices. Firms wishing to master this discipline must incur significant learning costs. The decision to compete on the basis of rapid adoption of complex technology tools is a strategic one, and firms that choose to compete in this manner must configure themselves properly and provide the right internal incentives and facilitation to enable very rapid organizational learning. The greater the integration of CrIM capability in the firm, the greater the range of users will be. For this reason CrIM effectiveness is affected by a greater number of factors than other forms of intelligence management. Practitioners in this field will need to become technologically savvy and deftly juggle the holistic and comprehensive paradigms found in the business literature with the pragmatic, incremental change management-oriented approaches that users are presently seeking.

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Table 1: customer intelligence industry segments*

Systems integration (Accurate Business Solutions, Computer Sciences Corporation, eNiklas, EDS, FutureNext , infinis, Painted Word, Quaero, Siemens e-services, White Cross)

Analytics (Analytical Solutions Inc., Bits and Pixels, Cognos, Computer Associates, DataZen, Gentia/ThinkAnalytics, Ithena/Business Objects, MetaEdge, NetGenesis, Neural Innovation, Norkom, Personify, Quadstone, SAS, Unica)

Navigation and content management (Ask Jeeves, ClientLogic, EchoMail, Primus)

Suites and platforms (Blue Martini, Broadbase, Business Objects, Delano, Data4s Solutions, e-Customers, e.Piphany, informatica, Interelate, Message Media, Narus, NCR, NovuWeb, Oracle, Primal Systems, Sagent, Vignette)

Marketing/profiling/marketing automation and optimization (Annuncio, Cogit, Cyber Dialogue, Engage, Group 1 Software, Impact, Intellitracker, Jupiter Media Metrix, Marketswitch, MDB, Memetic Systems, NetRaker)

Market and competitor intelligence (Business Intelligence Source, Core Intellect, Factiva, Online Marketing Research Services)

Customer behavior intelligence (Customer Assurance, Humanvoice, NetGeo, Truis)

* July, 2001