Re-engineering the customer relationship: leveraging knowledge assets at IBM

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Abstract

A successful knowledge management strategy identifies a firm’s key leverage points essential to achieve business results. These often reside in core business processes that may be re-engineered to capitalize on and expand organizational knowledge resources and capabilities. This case describes a 4-year initiative undertaken by IBM to re-engineer its customer relationship management process and capitalize on knowledge-based resources. The case illustrates the effective, integrated use of information technologies to improve the performance of both customers and IBM’s human experts by providing knowledge access and availability, acquiring and assembling knowledge, and disseminating knowledge to those who need to apply it.

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1. Introduction

In response to increasingly volatile and competitive environments, organizations are examining how they can better leverage knowledge assets for value creation. The field of knowledge management (KM) addresses the issues of creating, capturing, and transferring knowledge-based resources [1,8,25]. A successful KM strategy identifies a firm’s key leverage points essential to achieve business results. Often, these reside in core business processes that may be re-engineered to capitalize on and expand the organization’s knowledge resources and capabilities. The growth of the Internet, Intranets and extranets, and the rapid penetration of information technology (IT) into business processes are enabling changes that can significantly enhance productivity and performance and simultaneously enable KM [15].

In this paper, we describe a 4-year initiative undertaken by IBM to re-engineer its customer relationship management (CRM) process and capitalize on its knowledge-based resources. The changing dynamics of the global workplace, declining customer loyalty, and shrinking margins are forcing companies like IBM to rethink how they manage the customer relationship. Importantly, the network economy is
creating unprecedented opportunities (and pressure) to redefine the customer experience from a basic transactional exchange to a more partnership-oriented relationship. IT provides the mechanism through which long-term, individualized relationships with customers can be created. Internally, IT can deliver new levels of speed and effectiveness by streamlining and integrating product development, CRM, and the supply chain. In general, these business processes are highly knowledge-intensive and a firm’s long-term viability depends on the successful expansion and exploitation of its knowledge assets across business processes [32].

Drawing from the disciplines of KM and CRM, IBM’s initiative within its AS/400 computer systems division resulted in a prototype called Inside IBM. Based on lessons learned from the proof-of-concept initiative, Inside IBM was subsequently adopted as a corporate standard leading to IBM’s e-Services as it is known today. Deploying artificial intelligence, information systems, and user-centered design, the Inside IBM prototype aggregated IBM’s accumulated product support knowledge into a single system. Inside IBM also enabled collection of information about the customers’ usage context (i.e., configuration and performance data) that gave IBM the ability to understand and manage assets installed in the customer’s environment. This capability allowed for remote problem diagnosis and individualized targeted sales and marketing through an electronic channel.

Delivered via the Internet, Inside IBM allowed customers to link directly to IBM’s Intranet and backend cross-functional knowledge-based resources. From the customer’s perspective, the system provided a single point-of-contact with IBM. Historically, customers complained that there were too many “relays of information” in the current value chain. Inside IBM allowed customers to quickly access information and human knowledge-based resources consistent with their needs. The goal of the system was to provide access to integrated information, knowledge, learning experiences, advice and guidance at the moment of customer need. Customer and corporate knowledge was distributed in the fastest possible time and with minimal “relays”.

This paper describes the elements of IBM’s initiative, key challenges, the design and implementation approach taken, and lessons learned. We begin with a description of CRM and its links to KM. We then describe the problem background that led to IBM’s initiative. Next, we describe the approach taken to design Inside IBM and the results of a pilot study undertaken with a select group 58 customers. We conclude with a summary of the impacts of this initiative and the implications of IBM’s experience.

2. CRM and KM background and theory

As the dynamics of the global marketplace and the requirements for competition success have changed, the need for managing the customer relationship has grown. Customer relationship management (CRM) involves attracting, developing, and maintaining successful customer relationships over time [3,10]. It is not enough to attract new customers. Too many companies suffer from high customer churn, or customer turnover [18]. Acquiring new customers can cost five times more than satisfying and retaining current customers [31]. CRM centers on gaining a steady or increasing “share of customer”, i.e., getting a constant stream of new business from current customers, not a constant stream of new customers. To accomplish this, the firm must understand what makes a specific customer unique, and then tailor services to accommodate that uniqueness [12,22]. The objective is to continually build customer satisfaction and value, which in turn builds loyalty and long-term profits [26,27]. Effective CRM hinges on using real-time, customer-level information and interaction to create long-term profitable customer relationships.

At the core of CRM is the development of a “learning relationship” that engages customers in a two-way dialogue that is effective and efficient for both customers and the firm [29]. For the customer and the firm, the relationship gets smarter and deeper through every interaction. Interactions are no longer discrete transactions; rather, they reflect an ongoing knowledge-based process [9,12]. CRM has its roots in relationship marketing. Relationship marketing has moved to the forefront of academic marketing research and marketing practice [2,30]. Relational marketing theory holds that social and structural ties between businesses and customers can be established
and leveraged to stimulate mutually beneficial economic exchanges [11,14]. Historically, relationship marketing has focused on the business-to-business buyer and seller where closely coupled relationships between key suppliers and their major business customers are commonplace (see Ref. [5] for a review). The advent of IT has made it feasible to expand the scope of the notion of CRM beyond key accounts to a point where one-to-one individual customer-level marketing can be implemented in large scale.

Directly related to and underlying CRM is the emerging discipline of knowledge management (KM). In a business context, knowledge is defined as information that is relevant, actionable, and based at least partially on experience [19]. In essence, knowledge is what employees know about customers, products, processes, and past successes and failures. Knowledge creates value in use [13]. A key challenge in the application of knowledge is transferring it from where it was created or captured to where it is needed and should be used [24]. For example, cross-selling among divisions can only be effectively implemented if knowledge about customers is shared and leveraged across divisions [17,23,34]. Learning about how customers use products can generate information and knowledge that informs the design of new product solutions or the management of customer services such as maintenance [32]. Responding to customer-level feedback requires that that firm be able to flexibly customize its service or product offering. This often means that the firm must achieve a high degree of internal, backend integration. If the manufacturing, R&D and service organizations are going to be able to deliver what sales and marketing identify as the customer needs, then these disparate groups will have to cooperate and coordinate their efforts. A KM strategy can help tear down traditional cross-functional boundaries. KM entails helping people share and put knowledge into action by creating access, context, infrastructure, and simultaneously reducing learning cycles [7,8,25].

Today, advanced IT, network-centric environments, and the Internet are leading to the increased use of multiple media (Web, EDI, etc.) to interact with customers [4,28]. Compared to traditional forms of media (face-to-face, telephone, mail), the new media are highly cost-effective mechanisms for individualized interactions. The simultaneous distribution and acquisition of customer information through varied media enables highly targeted and efficient marketing efforts. Companies are using their customer databases and new communication media to create customer profiles, anticipate customer’s needs, conduct market research, and prompt customer purchase. From this, companies can differentiate their customers in terms of core needs and value to the firm [21,29,32]. This type of detailed customer-level knowledge provides a basis for prioritizing effort to gain the most advantage with the most valuable customers.

Three key technological aspects of CRM can enable the creation, capture, and transfer of knowledge-based resources: (1) customer interaction systems deployed to reduce internal costs while providing easy access to knowledge resources (e.g., product information, human experts); (2) integrated channel management intended to make the customer experience is consistent across all media while simultaneously capturing and using relevant data-information-knowledge to maximize revenues; and (3) analytical tools (e.g., online transaction and analytic processing), allowing for the analysis, distribution of customer information and profiles within and between functional areas to support and enable proactive marketing and sales [28,33].

Popular press reports, conferences, books, the growing number of CRM and KM systems, vendors, and consultants, all indicate a surge in interest and emphasis on both CRM and the management of organizational knowledge. However, a recent (1999) industry study by the International Data Corporation (IDC) and Cap Gemini found that only 12% of large European and North American companies have operational CRM systems, the majority of these first-generation systems that focus primarily on call centers. Second-generation CRM systems that enable market-sensing and customer-linking activities are just emerging [28,33]. Achieving the true benefits of leveraging knowledge-based resources into CRM systems requires cross-functional integration with related core business processes, like product development and supply chain management [21,32]. However, a review of the literature reveals little guiding theory or empirical research that meaningfully addresses issues of how firms can capitalize on knowledge resources and evolve from a transactional focus
to a market-driven, relational customer focus [16,21]. Many unanswered questions arise, including: What organizational and cultural challenges need to be addressed and managed for change to take place? What role can new technologies like the Internet and Intranets play? How can organizations build, deploy, and manage the technical architecture while ensuring the coherence of processes, systems, and people?

In the following sections, we report on our case study with IBM in which we explore IBM’s first effort to re-engineer the CRM process by leveraging technology and its knowledge-based resources. The effort, led by a senior executive and task force, represented the first strategic attempt by IBM to exploit the Internet as a new channel to “touch the customer”. As a methodology, a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context. According to Yin [35], case study methodology is particularly appropriate when examining “how” and “why” questions that deal with complex links that need to be traced over time and in context. Data collected through a case study methodology “are a source of well-grounded, rich descriptions and explanations of processes” [[20], p. 1].

3. Problem background

Over the past four decades, the approach IBM has taken to selling products and serving customers has evolved. With its commanding market share of mainframe computers in the 1960s and 1970s, IBM’s renowned product support generated a steady stream of revenues. By the 1980s, however, the rise of smaller, cheaper, networked computers led to increasing competition and choices for customers. During the early 1990s, IBM deployed a geographically based sales organization that was increasingly unable to serve customers. As one IBM executive put it: “We were a mile wide, but only an inch deep in understanding and supporting our customer’s needs. R&D focused on product functionality versus [usability] and serviceability”. In a competitive marketplace with decreasing product differentiation, functionality alone can be a hard sell.

From 1986 to 1992, IBM’s market share dropped from 30% to 19%, with each percentage point representing US$3 billion in revenues. In response, rather than paying attention to customer needs, IBM focused on its own financial needs and tried reducing costs by cutting customer service staff and levels of support. In the end, customers were driven away. Thus, by the mid-1990s, the changing market environment and downsizing necessitated that IBM rethink the basic way they service customers. In late 1994, an IBM executive from Corporate Strategy was charged with the task of addressing the problem of declining market share and customer defection. The executive put together a cross-functional task force consisting of system development experts and representatives from business, marketing, and product development.

The task force was guided by five key IBM strategic initiatives: (1) exploit IBM’s technology; (2) deliver on the promise of client/server technology; (3) achieve leadership in network-centric computing; (4) be the best at delivering value to customer; and (5) leverage IBM’s size and scale to achieve cost and market advantage. Fundamentally, the task force was faced with two significant challenges. The first was how to use technology to make knowledge resources readily accessible and available to easily acquire and assemble customer information and apply knowledge to support and enhance the customer relationship. As a senior IBM executive put it, “Knowledge management in its true application leads back to the customer”. The second challenge was convincing customers and IBM itself that this new way of conducting business would, in fact, enhance performance.

Through the 1980s and early 1990s, IBM’s primary points of contact with customers were the business partners, the direct catalog, and the traditional “Blue suits”. The task force recognized that advanced IT, the burgeoning Internet, and the emerging network-centric environment presented great opportunities for improving IBM’s CRM process and leveraging its knowledge assets. The first hurdle facing the task force was convincing senior divisional executives that technology, in particular the Internet, could be leveraged as a source of competitive advantage. After presentations to 12 corporate divisions, the Product Support Services group, Midwest Marketing region, and the AS/400 computer systems division agreed to sponsor the initial project.
This combination of products, services, and customers would provide the context for the initial pilot.

4. Understanding the customer

The first step for the task force was to identify and understand the customers’ current “points of pain” in their interactions with IBM. This step was essential before undertaking any design effort intended to leverage the new electronic channel opportunity. Preliminary market research was conducted with a select sample of 58 AS/400 customers. The customers were geographically distributed and represented eight diverse industries (i.e., manufacturing, service/distribution, finance, utilities, agriculture, medical, K-12 and higher education, and government). The volume of business conducted with IBM ranged from US$7 thousand to over US$2 million annually. Given the traditional means of interacting with IBM, 32% of these customers interfaced directly with IBM, 40% used a mix of direct contact and business partner, and 28% interfaced solely through IBM business partners. Preliminary assessments of these customers revealed that as the amount of their network connectivity increased, so too did the complexity of their computing environments (i.e., integration of AS/400s, PCs, Unix-based and mainframe hosts). However, in terms of the technical sophistication of these customers, only 37% reported strong internal technical expertise. While customers often knew what technology they wanted to purchase, what they were really looking for was “guidance on how to use technology to solve their business problem”, that is, customers emphasized solutions over technology.

Using a combination of qualitative research (i.e., interviews, focus groups) and quantitative research (i.e., structured, semi-structured surveys), the task force sought to understand the drivers of satisfaction for various customers in addition to their current “points of pain”. Customers defined satisfaction in four ways: (1) the overall responsiveness of IBM, i.e., a “holistic” view of responding to customer needs and not just “selling” technology, 39%; (2) ease of access to and ease of conducting business with IBM, 35%; (3) trust in continuing future product development, i.e., customers wanted assurance that IBM would remain current in meeting their technology needs, 18%; and, (4) product-to-price value ratio, i.e., IBM would continue to be competitively priced, 8%. Initial interviews revealed that overall customer satisfaction was not trending in a positive direction. When asked, “In the past 2 years, has your satisfaction with IBM increased, stayed the same, or decreased?”, only 21% reported an increase, while 40% reported a decrease.

Interviews revealed several frustrations or “points of pain” for customers. These included the inability to easily access IBM information and human expertise, a lack of responsiveness by IBM in addressing customer’s specific needs, and the concern that they were losing (in some cases had already lost) all contact and any type of relationship with IBM. Customers also stated frustrations with ordering (including determining the right product configuration), contract implementation, and billing processes. Customers stated that these “fractured” communications with IBM resulted in a loss in their own productivity, made them less responsive to their own customers, and led to an inability to leverage their current investments due to a lack of knowledge about IBM products or services. The following is a sample of comments from customers:

- “I can’t be truly satisfied, if I don’t know what you offer.”
- “IBM used to be credible. Now when I have a problem I don’t even know who to call.”
- “We used to have people call on us to give us advice or help. Now everything has to be solicited.”

The task force concluded that while customers perceived that knowledge-based resources existed within IBM, there was no way for customers to easily utilize those resources. Current communication methods (announcements, pricing information, education, seminars, etc.) and sources (current contacts with IBMers, business partners) were deemed unreliable and largely inaccessible. IBM would need to improve marketing support and be more proactive on behalf of the customers in order to improve satisfaction and performance.
5. Re-engineering of the customer relationship: objectives of Inside IBM

With a deeper understanding of the AS/400 customers, the task force set forth to design a new CRM process and electronic system for implementation, called Inside IBM. The CRM process and system was to be organized around customer needs, not IBM products. Driven by IBM’s strategic initiatives and principles of KM, the task force considered how to leverage IT, the Internet (as the delivery mechanism), and IBM’s growing Intranet in support of the customer relationship. To accomplish this, the task force conducted extensive external benchmarking to gain a better understanding of best-in-class CRM processes. The team conducted case studies with such companies as Federal Express, American Airlines, and American Hospital Supply. These companies had set the standard within their own industries and were able to gain significant competitive advantage using an electronic interface with their customers. At the same time, the task force was keenly aware that IBM’s competitors (e.g., Hewlett-Packard, Microsoft, Packard Bell) were all reported to be working on similar initiatives. This exacerbated the need to move quickly and capitalize on IBM’s resources so that the effort would produce a competitive advantage.

After careful study of best practices, the task force identified several general system design requirements:

1. Inside IBM should provide a common and single interface, or point-of-contact, for the customer.
2. Inside IBM should be flexible in use, allowing customers to control as much of the interaction as possible according to their needs. Multiple sources of information should be accessible in a consistent way, but customizable to reflect individual customer needs.
3. Inside IBM should be intuitive and user friendly for all external and internal audiences who interface with it.
4. Inside IBM should provide easy access to IBM’s organizational knowledge-based resources and improve decision-making processes for both the customer and IBM’s workforce.
5. Inside IBM should provide a learning opportunity by facilitating knowledge exchange in the areas of business, technology, and marketing, i.e., integrate product development, CRM, and the supply chain.
6. Inside IBM should improve backend communication and cross-functional coordination.
In essence, the creation of a single, dynamic interface would be used to replace the broken or nonexistent link between IBM and its customers with the end goal of increasing profitability, sales, customer satisfaction, share of customers, and return on investment. A high-level conceptualization of Inside IBM is shown in Fig. 1. In the following section, we describe Inside IBM in more detail, illustrating how it would enhance the customer relationship and allow IBM to leverage and manage knowledge-based assets.

6. Inside IBM: enabling CRM through KM

As shown in Fig. 1, a mass customized front-end interface was presented to registered customers via an Internet connection. This interface provided a 24×7 link into IBM’s Intranet and cross-functional back-end services. Announcements, educational services, product information, order fulfillment, links to business partners, and other services were available and readily accessible, increasing customer’s awareness of IBM’s varied knowledge-based resources. Customers were provided with an interactive data, voice, and image connection to IBM and its knowledge-based resources. Ultimately, as higher speed Internet connections became available a video connection would be added.

Inside IBM was organized around customer needs with the recognition that different customers would require varying degrees of assistance. For example, some customers might prefer self-service using searchable on-line knowledge bases, “what-if” product and pricing configurations, and online ordering. Conversely, others might prefer direct interaction with IBM subject matter experts. As shown in Fig. 2, for all scenarios, Inside IBM routed requests for information or services to the appropriate knowledge-based resource. Through automation, IBM would reduce its costs by making a human expert the last option in the chain, or more specifically, the option only for those customers who really want it.

One of the most often heard complaints from the sample of 58 AS/400 customers was that, in their interactions with IBM, there were “too many relays of information”. That is, whenever a customer had a question or problem, they were forced to navigate through IBM hoping to find the expert who could clearly address the question and/or diagnosis the problem. For each point of contact, the customer would have to repeat their request. And, at each relay, the IBM employee would have to look up the customer to find relevant information (e.g., service contract, installed product configuration), enhancing the frustration of the customer by lengthening the time required to receive service and support. In response, IBM Inside provided internal support to the IBM human experts whose job it was to serve the customer.

Similar to the single point-of-entry provided to customers, Inside IBM provided IBMers a customized interface residing on a common customer database. The internal interface allowed for a ready response to customer queries by enabling the customer and IBM human expert to share customer-specific information. Customer profiles were created, updated and maintained as customers interacted with

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Fig. 2. Inside IBM: customer view.
the system, and made readily available to IBM service and support personnel instantaneously. Customer profiles included firm and industry demographics, contact names, entitlement information, and general product interests. IBM was acquiring and assembling valuable customer data, information, and knowledge while a customer was interacting with Inside IBM. This allowed IBM to maintain a unified view of each customer, regardless of who was interacting with the customer. In this way, informed requests were routed to human experts, as needed, in support of the customer. Moreover, human experts had the ability to view a customer’s screen remotely in a shared environment. In concert, these features would effectively eliminate relays of information and increase customer satisfaction. Fig. 3 provides a summary of the knowledge-based resources available to customers and IBM’s human experts via their respective Inside IBM interfaces.

Enabling comprehensive support of customers required that IBM truly understand and manage assets installed in the customer’s environment. This required an upstream link into the product development process. As an IBM task force member stated: “We couldn’t re-engineer support for AS/400 customers after the core product had been designed and shipped out the door”. Therefore, diagnostic intelligence was integrated into the fabric of the AS/400 computer. As shown in Fig. 4, whenever a customer would begin session with Inside IBM, an applet was sent to the customer’s system to trigger the diagnostic device residing in the customer’s installed AS/400 system. In addition to customer profiling information, Inside IBM provided the capability to acquire “vital product data”, i.e., system configuration and performance data. Machine types, model numbers, rack and network configurations, software and release information are examples of information which can be acquired electronically and automatically.

The technological innovation enabling capture of “vital product data” presented several benefits to both IBM and its customers. The innovation differentiated IBM’s initiative from that of its competitors (e.g., HP, Microsoft) whose initiatives were largely customer-driven, not services-driven, i.e., customers had to acquire CDs for installation or download software agents via the Internet. Armed with the ability to electronically gather consistent and customer-level data regarding a specific installation, IBM was able to collect information on every problem, diagnosis, and subsequent fix. These data were stored in a linked existing database, called RETAIN (Remote Technical Assistance and Information Network). RETAIN, with the captured expertise of many years, could heuristically diagnose problems and/or identify appropriate solutions that the human expert would immediately offer to the customer. Additionally, using sophisticated data-mining techniques on the collective data of multiple customers, RETAIN could predict hardware and software problems that were likely to occur before they actually happened. Given that the customer’s profile, current system information, diagnostic information and associated solutions were immediately available to IBM’s human expert, the customer could immediately be en-
gaged in a consulting relationship. This remote application of customer-level information to both solve and anticipate customer problems represented a fundamentally new way of managing customer relationships. This allowed for efficient and proactive targeted sales and marketing in addition to remote problem diagnosis and repair.

In summary, Inside IBM provided the means to enable active two-way interaction between IBM and its customers. This approach is in direct contrast to passive one-way Web sites or reactive responses to customer-initiated requests or complaints. The mass customized front-end interface represented a single point of access into IBM, thereby making cross-functional backend knowledge and resources readily available. By combining the disciplines of CRM and KM, and through the deployment of technological innovations and advanced IT, Inside IBM represented a full-fledged business approach to the acquisition, assembly, and application of knowledge to the CRM process. Inside IBM would collect and present data, information, and knowledge to multiple audiences (customers, service and support personnel, and other IBM functional areas) in a meaningful context. The task force believed that people, when performing work, need just enough, just-in-time, and best-represented content to apply to the required thinking, decision, or action at hand.

The next step for the task force was to implement and test the prototype system with the sample of 58 AS/400 customers. This pilot study represented an important test of concept and would be used to develop a business case to request funding for further development of Inside IBM. The following section details the results of the pilot study.

### 7. Inside IBM: proof-of-concept pilot study

A prototype of Inside IBM was installed in 58 customer sites throughout the United States. To minimize cost to the customer and to ensure 24×7 access, IBM installed a thin client (with an embedded URL to Inside IBM) on each customer’s network and, if needed, provided an Internet connection. At the time of the pilot test, 71% of participating organizations had either started using the Internet or planned to start utilizing it within 1 year. 73% had either implemented or planned to implement a means to be electronically linked to their own customers. Each installed customer “seat” cost US$317, representing a low expense, but potentially high-value pipeline to each customer. The pilot was conducted over a 6-month period in partnership with the Midwestern Marketplace, Availability Services, and the AS/400 Division. The purpose of the pilot study was to assess the feasibility of Inside IBM, as well as quantify the benefit and value of supporting the customer relationship. Fundamentally, the question was: Would Inside IBM address customer frustrations and “points of pain” and enhance satisfaction and performance? At the end of the 6-month period, a survey was distributed and follow-up interviews were conducted.
Results indicated that nearly two-thirds of customers found using Inside IBM to be beneficial (21% very beneficial, 45% beneficial, 26% somewhat beneficial, and only 8% of little or no benefit). Customers identified key benefits including easy access to information (43%), access to human experts and information for problem resolution (33%), and ease of purchasing (22%). Essentially, Inside IBM provided a painless means of accessing IBM and assured that IBM would be available and ready to meet their needs. Here is a sampling of positive and negative customer comments regarding benefits:

- “It saved me time waiting for responses to questions related to information that is needed or for problems that need to be fixed. I had a contract I wanted to act on but could not get through on the phone. With Inside IBM, I could type in the information and be assured that a quick response would be there.”
- “Having IBM services on-line so that we know what is available. Ordering on-line is the only way to go.”
- “In the past I had to go through a whole network of people to get to the information and help I wanted. Now, all I have to do is sign on to Inside IBM.”
- “Having direct access to information and IB-Mers at my fingertips made me more productive.”
- “It enabled me to know what is possible and explore ideas I had. Our IBM marketing rep doesn’t know everything about our business and would probably have to live on our site in order to do so. This will allow me to build a relationship with IBM based on the value they can provide us.”
- “Speed is an issue... it might be helpful, but it is too slow and it might help if information was easier to find. Too much time was spent learning how to navigate the tool.”
- “It seems to be just another marketing tool. Maybe it will be better when all the bugs are out.”

The follow-up survey assessed five activities that Inside IBM was designed to impact: information gathering and usage, problem resolution, implementation of contracts, ordering, and billing. Customers had identified these five activities as “points of pain” in their existing relationship with IBM. Table 1 presents a summary of selected attributes of each activity and the results of the pre- and post-pilot responses. A close examination revealed an improvement in each activity and for each attribute within each activity.

Overall, customers participating in the pilot study gave a strong endorsement of Inside IBM. Over 75% reported that it would enhance IBM’s image as a solution provider. When asked if Inside IBM would enhance the value of the customer’s relationship with IBM by addressing the “points of pain”, nearly 63% indicated that it would have a significant or very significant effect. Less than 8% reported that it would have little or no significance in enhancing the relationship. Importantly, the task force found value to be “in the eye of the beholder”. That is, customers who perceived the most value were also those customers who depended on IBM as a valued resource.

When asked if IBM should continue to invest in development of the prototype, 83% agreed or strongly agreed. If IBM did not continue these efforts, customers felt that they would be compelled to evaluate other offerings since there would continue to be a lack of knowledge about IBM products or services. Moreover, the two-way means of communicating that is essential to building a customer relationship would be lost. In essence, IBM would have lost a means of differentiating themselves to their customers. Here is a sample of comments:

- “If you don’t continue, you had better expand on the complaint department. If I have to spend 45 min on the phone again, I will go ballistic. Inside IBM will enable me to get to the right person and save me a lot of time.”
- “I will waste more time and money in getting my problems resolved.”
- “The visibility of IBM would be gone, and would only encourage us to investigate other options. I don’t know that we would drop IBM, but I could see IBM not getting much revenue from us.”
- “I will lose another avenue to communicate with IBM. Inside IBM is the one thing that offers hope in my relationship with IBM.”
Table 1

<table>
<thead>
<tr>
<th>Customer “Points of Pain”</th>
<th>Selected survey items</th>
<th>Responses Pre-pilot (%)</th>
<th>Post-pilot (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Gathering and Use</td>
<td>1. Overall satisfaction with process.</td>
<td>1.57</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td>2. I am able to rely on IBM for the information</td>
<td>2.61</td>
<td>2.79</td>
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<td></td>
<td>3. I use daily to do my job.</td>
<td>3.52</td>
<td>3.71</td>
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<tr>
<td></td>
<td>4. I am currently very satisfied with the process of getting information from IBM.</td>
<td>4.50</td>
<td>4.73</td>
</tr>
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<td></td>
<td>5. It is very easy to get information from IBM.</td>
<td>5.48</td>
<td>5.72</td>
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<td></td>
<td>6. It is not time consuming to get the information I need from IBM.</td>
<td>6.43</td>
<td>6.68</td>
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<td></td>
<td>7. I get customized information from IBM to meet my specific needs.</td>
<td>7.54</td>
<td>7.66</td>
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<td></td>
<td>8. Announcement material from IBM is easy to obtain.</td>
<td>8.60</td>
<td>8.80</td>
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<tr>
<td>Problem Resolution</td>
<td>1. Overall satisfaction with process.</td>
<td>1.65</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td>2. IBM is very responsive in fixing my problems.</td>
<td>2.73</td>
<td>2.80</td>
</tr>
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<td></td>
<td>3. IBM takes ownership of my problem.</td>
<td>3.69</td>
<td>3.80</td>
</tr>
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<td></td>
<td>4. It takes very little of my time to identify the problem.</td>
<td>4.60</td>
<td>4.69</td>
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<td></td>
<td>5. I have no difficulty in finding the right person to fix my problem.</td>
<td>5.55</td>
<td>5.64</td>
</tr>
<tr>
<td></td>
<td>6. The necessary “system configuration” information is available when I interact with IBM.</td>
<td>6.70</td>
<td>6.85</td>
</tr>
<tr>
<td>Ordering Products and Services</td>
<td>1. Overall satisfaction with process.</td>
<td>1.61</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td>2. Determining the right product configuration to order is simple.</td>
<td>2.47</td>
<td>2.47</td>
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<tr>
<td></td>
<td>3. Ordering products from IBM is easy.</td>
<td>3.63</td>
<td>3.63</td>
</tr>
<tr>
<td></td>
<td>4. Ordering service from IBM is easy.</td>
<td>4.66</td>
<td>4.66</td>
</tr>
<tr>
<td></td>
<td>5. Ordering from IBM takes very little of my time.</td>
<td>5.60</td>
<td>5.60</td>
</tr>
<tr>
<td></td>
<td>6. I know whom to contact to order something from IBM.</td>
<td>6.62</td>
<td>6.62</td>
</tr>
<tr>
<td></td>
<td>7. I have confidence that what I order will be configured properly for my environment.</td>
<td>7.65</td>
<td>7.65</td>
</tr>
<tr>
<td>Contract Implementation</td>
<td>1. Overall satisfaction with process.</td>
<td>1.63</td>
<td>1.69</td>
</tr>
<tr>
<td></td>
<td>2. IBM contracts do not take a long time to implement.</td>
<td>2.66</td>
<td>2.72</td>
</tr>
<tr>
<td></td>
<td>3. IBM contracts do not get in the way of conducting business with IBM.</td>
<td>3.64</td>
<td>3.71</td>
</tr>
<tr>
<td>Billing</td>
<td>1. Overall satisfaction with process.</td>
<td>1.63</td>
<td>1.69</td>
</tr>
<tr>
<td></td>
<td>2. IBM’s invoices are accurate.</td>
<td>2.59</td>
<td>2.65</td>
</tr>
<tr>
<td></td>
<td>3. I seldom spend time correcting invoices.</td>
<td>3.59</td>
<td>3.67</td>
</tr>
</tbody>
</table>

Finally, customers reported that they would purchase more from IBM due to Inside IBM. The potential to grow revenue was attributed to three key factors. First, for customers who already prefer IBM products and services, Inside IBM would help maintain this mindset by enhancing the customer relationship and loyalty (i.e., grow the share of customer). Second, the pilot test indicates that Inside IBM enhanced awareness of IBM’s products and services, thereby addressing the problem that “you can’t purchase products or services you are not aware of”. Third, Inside IBM increased the ease of ordering, which should support revenue growth. In fact, during the pilot study, over US$2.2 million in actual revenue was generated via Inside IBM. The task force concluded that loyalty could be significantly en-
hanced, leading to revenue growth, as service and support issues were being addressed.

In conclusion, results of the pilot study highlighted a key lesson learned regarding keeping customer’s satisfied: Consistency and accuracy of information, access to knowledge-based resources, and timely communication would prevent problems or assist in resolving them faster. Customers believed that Inside IBM provided the means to accomplish these things—the proof-of-concept had been established. Another key lesson of the pilot study was a better understanding of what effect Inside IBM might have on IBM sales representatives and business partners. Early in the project, IBM sales representatives had expressed strong concerns that Inside IBM posed a threat to them due to its potential for disintermediation; i.e., transfer of the customer relationships from the human contacts (sales reps and business partners) to Inside IBM. Interestingly, the task force engaged the sales representatives in the pilot study. At the end of the pilot study, the sales reps reported that Inside IBM provided them with more data, information, and knowledge about customers, which they believed could make the sales process more efficient and effective, and provide them with expanded reach. Conversely, three business partners involved in the pilot study were instantly disintermediated. This forced IBM to rework Inside IBM so that customers would be tracked to the “rightful owner” because IBM believes it is not in its best strategic interest to disintermediate valued business partners.

8. Impacts

Successful organizations, like IBM, are searching for ways to improve and manage the customer relationship. Inherent to these efforts is the need to distribute and acquire knowledge assets in an efficient and effective way. New product development, marketing, service and support are all key drivers of growth for sales and profitability, particularly with increasing competition and rapid technological change. However, the most successful firms will be those that can integrate customer knowledge and insight across their core business processes [16, 21,32]. These are the firms that will be responsive and market driven as necessary and yet have the foresight to be market-driving [9,10]. Viability depends upon the quality of a firm’s relationships with its customers and the successful exploitation of its knowledge-based assets. For IBM, the potential to leverage its knowledge and the new electronic channel beyond the Inside IBM prototype was tremendous.

IBM successfully combined the disciplines of CRM and KM in designing Inside IBM to improve its relationship with its customers. Consistent with IBM’s strategic initiatives, Inside IBM exploited technology to establish a knowledge-rich, interactive, multi-media connection to its customers and business partners. This case illustrates the effective, integrated use of advanced IT to improve the performance of both customers and IBM’s human experts by providing knowledge access and availability, by acquiring and assembling knowledge, and by disseminating knowledge to those individuals (internally and externally) who need to apply it. Key benefits to IBM included: (1) the leveraging of its organizational knowledge resources in the customer relationship process, (2) improvement in problem-solving processes, (3) the facilitation of rapid fire, individualized interactions with customers at increasing depth, (4) improvements in customer satisfaction via a collaborative and learning relationship, and (5) facilitation of cross-functional coordination, learning and knowledge exchange in the areas of business, technology, and marketing.

The insights gained during the design, development, and pilot test of Inside IBM created a strong appreciation among top executives, including CEO Lou Gerstner, for the value of managing knowledge and the customer relationship via technology. Following the pilot study, the task force developed a business case to request US$2.3 million of corporate funding for additional development. It was estimated that US$525 million of incremental revenue and US$50 million of productivity savings would be realized over a 3-year period as a result of the investment. More importantly, however, the task force successfully argued that Inside IBM should be adopted as a corporate standard. In the mid-to-late 1990s, several (often-competing) efforts existed within multiple divisions to create strategies for exploiting electronic channels to customers. Increasingly, for all organizations, the challenge is to
impose and coordinate control over the growing number of customer interfaces [6]. For IBM, uncoordinated approaches could lead to confusion in the marketplace and ultimately increased development costs should IBM be forced to retrofit separate solutions to create a consistent corporate standard. Establishing Inside IBM as a corporate standard would allow for a single cross-platform, cross-divisional electronic interface to customers. This standard provided a means to achieve CEO Gerstner’s objective of maintaining responsive, decentralized business units while at the same time coordinating critical resources and customer solutions across units.

Importantly, adoption of a corporate standard would begin to address an important issue that arose as a result of the success of the Inside IBM initiative: who “owns” customer knowledge. That is, since the backend database represented a source of customer knowledge, internal groups immediately sought to “own” the database. If one group (e.g., sales) owned the database, it could hurt the revenue stream of other groups such as service. For example, the database could provide information to sales representatives to help customers fix their own problems, thus bypassing the services function. The sales function could also cross-sell or up-sell, again damaging the revenue stream of the services function. As electronic interfaces continue to evolve and advances in technology increasingly enable the acquisition of deeper customer knowledge, it is likely that for IBM and other organizations the issue of knowledge monopolies will continue to be a problem [1,8].

The Inside IBM prototype continued to evolve and was expanded to include links to other existing electronic functions such as PartnerLink, IBM Direct, and Express Services. An additional US$10 million was invested in 1998 to strengthen the link between Inside IBM and the heuristic problem diagnosis capabilities of RETAIN. The expanded heuristic system would collect and store more data on customer problems and solutions. Importantly, following the lead of the AS/400 division, other divisions considered the approach of embedding diagnostic intelligence in the fabric of their network-centric offerings. Like the AS/400 division, they too would be able to gather system information and truly understand and manage assets installed in their customer’s environment. In 1999, IBM began investing US$14 million to embed intelligence in the RS/6000 systems and link it to RETAIN. In the next 2 years, IBM plans on embedding intelligence capabilities in all its customers networked systems. In the end, IBM will enhance its ability to diagnose and automatically prescribe solutions. In concert, that approach taken

Fig. 5. CRM solution architecture.
with the AS/400, RS/6000 and other network-centric offerings allows for consistent and coordinated sales and marketing efforts for all customers across all divisions. Growing from the Inside IBM proof-of-concept, today these collective efforts are known as IBM’s e-Services. IBM continues to explore new ways of efficiently and effectively supporting its customers in the context of its evolving CRM Solution Architecture, illustrated in Fig. 5.

With this architecture, customers and business partners have a single point of entry into IBM’s knowledge resources. The acquisition and distribution of data, information, and knowledge is becoming more and more important to firms like IBM. As such, the solution architecture places an emphasis on accessing and analyzing data real-time in support of the customer, rather than simply capturing transactions. Dating mining, neural networks, and other forms of online analytical processing are available to backend enterprise processes, as needed. In sum, this figure illustrates a unified CRM entity where all CRM solution segments will be integrated together beyond a silo view.

9. Conclusion

Given the changing economy, firms like IBM are facing a critical challenge: **how to leverage knowledge assets to significantly improve the customer relationship and transform the way business is conducted.** Several guidelines regarding how to successfully combine the disciplines of CRM and KM can be drawn from the IBM case.

1. **Focus efforts on critical issues that have high value and are aligned with organizational strategy.** IBM spent a substantial amount of time defining the performance problem with their current customers. Addressing these issues or “points of pain” was key in the design objectives of Inside IBM and provided a baseline comparison for assessment. Guided by corporate strategic initiatives, and by listening to their customers, IBM was able to maintain focus on the business issue at hand.

2. **Establish executive level support.** A key to the success of IBM’s initiative was the support of the AS/400 computer systems division senior management. Not only did it provide a funding source, but it also sent a clear message that this initiative was mission critical. Subsequently, adoption of Inside IBM as a corporate standard required support of top management, including IBM’s CEO.

3. **Treat knowledge as a process rather than a “product”.** IBM recognized that knowledge was meaningless when disconnected from the people (customers, business partners, and IBMers) and the processes that create and apply it. Inside IBM was designed to support the decision-making processes for all relevant audiences.

4. **Recognize that IT is the medium, not the message.** IBM deployed technology as an enabler of getting the right data, information, and knowledge to the right person at the right time. Clearly, technology was a key enabler of KM and CRM at IBM. Yet, the real challenge lay in the complex interplay between content, context, customers, and IBM. System functionality is meaningless unless it supports the performance of those using it.

5. **Prototype fast and prove the concept early.** IBM focused on urgency, execution and cooperation in pursuit of customer satisfaction. Gaining an early proof-of-concept in the marketplace far outweighed any incremental benefit of fixing all system bugs or developing full system functionality.

6. **Recognize the potential for knowledge monopolies.** IBM recognized that while technology can enable the acquisition and accumulation of knowledge, it can come at a high price to the organization if the knowledge is not accessible to and shared across functions. If one function owns knowledge that others need, the flow of knowledge will be inhibited and a knowledge monopoly will result.

7. **Use disciplined project management.** IBM carefully defined the scope of the project, including costs estimates. This is important because sufficient resources are vital to a project’s success. There were many instances where the task force was nudged in different directions and encouraged to broaden its scope. It is important to avoid “scope creep”, as the project may become prohibitively costly before the concept has been proven. This can lead to a seemingly never ending project and likely the loss of support.

In conclusion, for IBM, Inside IBM provided a means to consistently implement the customer relationship process and create a personalized, ongoing
dialogue between IBM and its customers. Leveraging the insights gained from this effort into its e-Services today, IBM believes that this initiative led to a CRM process and solution that provides their organization with a sustainable strategic competitive advantage. The re-engineering of the CRM process at IBM provides a rich example of an IT-enabled knowledge-based initiative and contributes to the emerging research on how firms are capitalizing on knowledge resources and evolving to a relational customer focus.

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