



Location in CRM: Linking Virtual Information to the Real World

An IDC White Paper

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IDC Opinion

What is the role of location-specific information in the customer relationship management (CRM) space?

IDC sees the role of location-specific information in CRM as tying the virtual world of information to the real world — customers, inventory, shipping, and the like. Location-specific information enhances CRM processes so that companies are better able to satisfy customer needs.

Location-specific information can help CRM systems satisfy customer needs to such an extent that customer relationships become a sustainable competitive advantage. However, achieving a sustainable advantage requires that underlying enterprise applications all focus on the customer.

This means that both front-office (sales, marketing, and customer support) and back-office (finance, HR, materials management, manufacturing) applications can be organized around a customer-centric viewpoint. However, the process of using location-specific information to integrate these systems presents significant business and technical challenges that we believe MapInfo is well suited to meet.

Executive Summary

Information systems support a huge range of processes — some virtual and some real. On the virtual Internet, information can be sent cheaply and easily from anywhere to anywhere. Some critical business activities such as banking can be done across the Net without physical or geographic constraint. People can collaborate on projects over the

Net regardless of where they are. The speed and efficiency of these virtual processes are changing many of the ways that we communicate and do business.

However, as illustrated in Figure 1, most processes are real and physical. Even those on the Web require some level of information about the real world to be completed. That information usually revolves around location. Similarly, most business transactions in the real world rely on information systems to be transacted successfully. Once again, capturing or linking location-specific information is important. Recording these location-specific transactions creates a history of customer information (e.g., buying habits, preferences). This history can be transformed into more effective customer relationship management programs — location is the key and can function as the link.

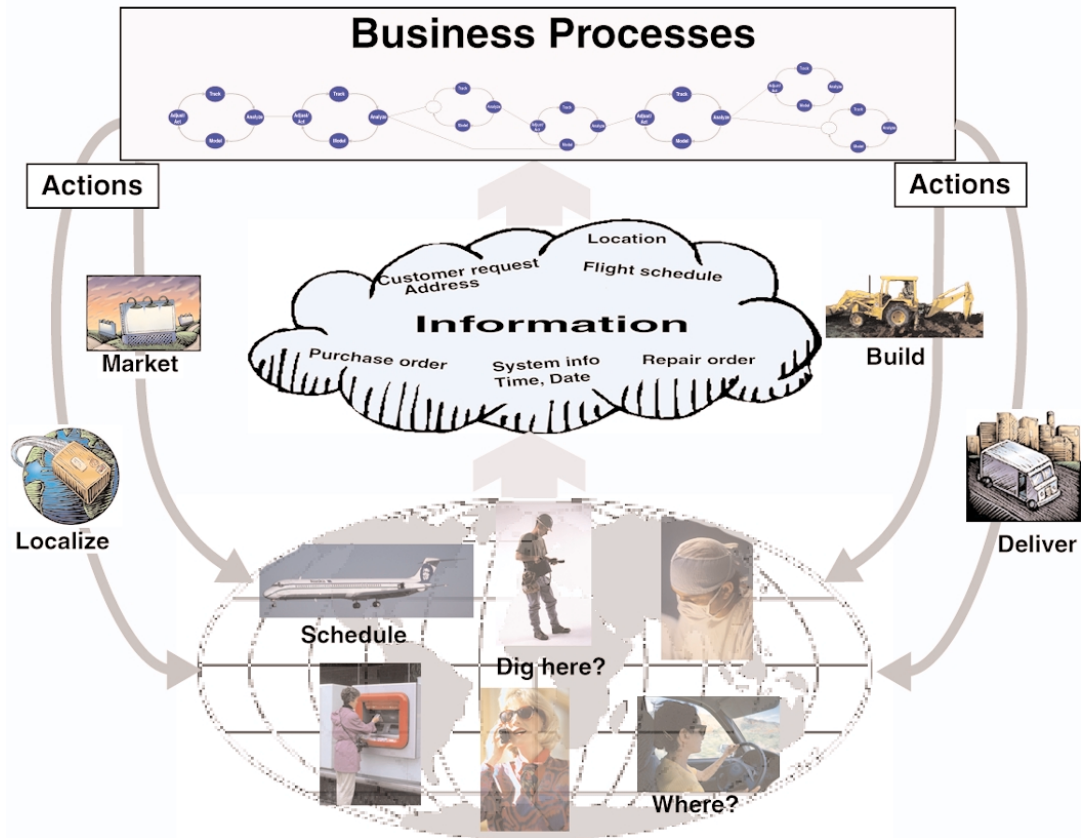
What do we mean by “linkage”? On the virtual side, people use information systems to gather and manage information about a wide range of events, transactions, and conditions that they experience in the real world. This information is about a wide range of physical realities. For example, consider the following:

- People of similar affinities and demographics live in specific neighborhoods.
- People work, shop, and enjoy recreation near their homes most of the time.
- While some purchasing is done online, most products and services are delivered to someone at a location.

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Figure 1
Flow of Location-Specific Information from Real World to Virtual and Back



Source: ISSI/IDC, 2000

- Politics and regulation enforcement are largely local matters.
- All communities and most companies have to maintain their physical infrastructures.
- Unless they can be expressed as 1s and 0s, raw materials and goods have to be physically transported to the places where they are used.

Location-specific information about these physical realities is all around us: addresses, place names, postal codes, political boundaries, phone numbers, sales districts, and on and on. Companies record this data in their information systems as an ordinary part of most business processes.

So, linkage is about tying location-specific information to the real world so we can use it to enhance our information systems and thus our business processes. Today, a

user has a wide range of technical options for creating linkages between virtual information and the real world: geocoding, digitizing, purchasing geographic information, and merging company data with location-specific data. (We discuss these options in the Technology Perspective section.)

To fully utilize location-specific information, organizations need to integrate spatial technology across both front-office (sales, marketing, and customer support) and back-office (finance, HR, supply chain, materials management, manufacturing) applications.

Once a company's information system is fully enabled to use location-specific information, the company will be able, for example, to find and develop profitable customers, assess profitability of customer transactions, analyze trade areas, deliver products and services more effectively, and comply more easily with local regulations and taxing.

In short, in the Information Age, location is still a fundamental organizing principle of the real world and consequently must be a fundamental organizing principle of information systems. What has changed in the Information Age is the way that data about location can move quickly and efficiently through business processes that include CRM.

To help explain the wide range of CRM strategies and software, IDC has created a framework for understanding it. We see CRM as a business strategy dependent on underlying enterprise applications that support an integrated approach to customer management. We believe that information about location must be an integral part of the underlying enterprise applications.

The goal of this white paper is to provide the reader with a broader understanding of CRM and how tightly integrated location information can enhance CRM processes. We discuss the role of location-specific information from the following four perspectives:

1. **Market.** A brief overview of the CRM market and the potential effects of location-specific information.
2. **Business.** This section covers customer focus and integration issues surrounding the linkage of front- and back-office applications with location-specific information. We also cover customer touchpoints in front-office applications, such as sales, marketing, and order management, and in back-office applications such as customer service, inventory, workflow, and supply chain.
3. **Technology.** We examine the critical functionality needed to integrate spatial information into CRM business processes. We also discuss the basic functionality that spatial technology can add to information systems.
4. **Emerging market.** We discuss the emerging location-specific services market and its potential impact on CRM.

In addition, we outline MapInfo's strategy for addressing the CRM market and discuss its relationship with Oracle. We then present our analysis of MapInfo's ability to participate in the location-specific CRM market.

Market Perspective: Overview of the CRM Market

IDC defines CRM applications as software applications that automate the customer-facing business processes within an organization. Specifically, these include sales, marketing, and customer service applications, collectively referred to as customer touchpoint applications. From a services perspective, IDC defines CRM as the consulting, implementation, operations management, support, and training required to design, build, and operate customer care processes and systems that help companies attract, retain, service, and expand relationships with customers.

The packaged CRM applications market, which stood at \$3.3 billion in 1999, is expected to grow to \$12.2 billion by 2004. This market represents packaged front-office applications for sales, customer support and field service, and marketing. Representative vendors in this market include Siebel, PeopleSoft (Vantive), and Oracle, as well as newer entrants such as Xchange, Vignette, and BroadVision. The opportunity for overall CRM services, which encompass services for both packaged and custom-built CRM applications, is expected to grow from \$33.4 billion in 1999 to \$125.7 billion by 2004.

We believe that the CRM analytic applications sector will be a strong market for location-specific CRM technology. In 2000, that market will generate \$454 million and will increase at a compound annual growth rate (CAGR) of 53% to \$2.38 billion in 2004.

While it is too early to measure revenue for location-specific information, IDC does expect spatial technology to have a positive effect on the overall CRM market, particularly in analytic applications. Spatially enabled data for CRM is becoming more available and more detailed from companies like MapInfo, Acxiom, and Claritas. In the near future, wireless location-specific services will begin to associate customer location with each customer transaction. As location-enabled technology becomes more pervasive, we expect companies to increasingly use location as a significant element in their information systems.

We should note that the location-specific CRM applications market is incremental to the traditional geographic information systems (GIS) market. The traditional GIS market involves applications and tools for managing and analyzing spatial data. In contrast, location-specific CRM applications involve the use of spatial information to address largely nonspatial issues. For example, a location-

specific CRM application can bring together customer history with temporal, psychographic, demographic, and competitor data to predict a customer's propensity to buy while moving through a market area.

Location-specific applications span the full range of front- and back-office applications found in most enterprise information systems. What spatially enabled CRM applications have in common is an ability to analyze location information in corporate data stores and thus produce a better relationship with individual customers.

Business Perspective: Customer Focus

In the 1940s and 1950s, mom-and-pop grocery stores had mastered customer relationships. When you went into your local grocery store, the owner knew who you were and what you generally bought. The owner would pick the items you requested from the shelf, bag them, and charge them to your account. The owner would even make suggestions based on his or her knowledge of your shopping habits. You would probably not think of shopping for groceries anywhere else.

In the 1960s and 1970s, huge supermarkets, with all their efficiencies, displaced small, family-owned grocery stores. One-to-one relationships disappeared and so did most customer loyalty. Today, customers churn from vendor to vendor looking for the best price for commodities like groceries, insurance, or phone service. As a result, companies have been forced to compete on the basis of price or other factors that can be matched by their competitors.

Companies are reacting by trying to reestablish more of a one-to-one relationship with their customers, hoping to enhance customer satisfaction and profitability — a sustainable competitive advantage. For these companies, the primary use of their information system is to gain and maintain a strategic position with their customers.

The challenge of sustainable customer relationships, and consequently CRM, is for an enterprise to respond to each customer interaction in some useful (to the customer) way. The company has to say to the customer, "I know you. Tell me what you want, and we will change the way that we deal with you, based on what you tell us." This kind of one-to-one interaction is only possible if the company has a unified view of each customer across the enterprise. This view has to include the customer's

preferences regarding location — where he or she lives, drives, works, recreates, and shops.

This unified view of customers requires customer-centric business strategy, processes, and technology — in other words, a significant commitment of effort and resources. However, if the company is successful in engaging the customer at a one-to-one level, the customer invests in the continuing benefits of the relationship. With every interaction and effective response to the customer's precisely defined requirements, the benefits to the customer of continuing the relationship increase. Soon, it is easier for the customer simply to continue the relationship than to go to the trouble and expense of trying to establish a similar relationship with someone else.

Integrating Location-Specific Information into CRM

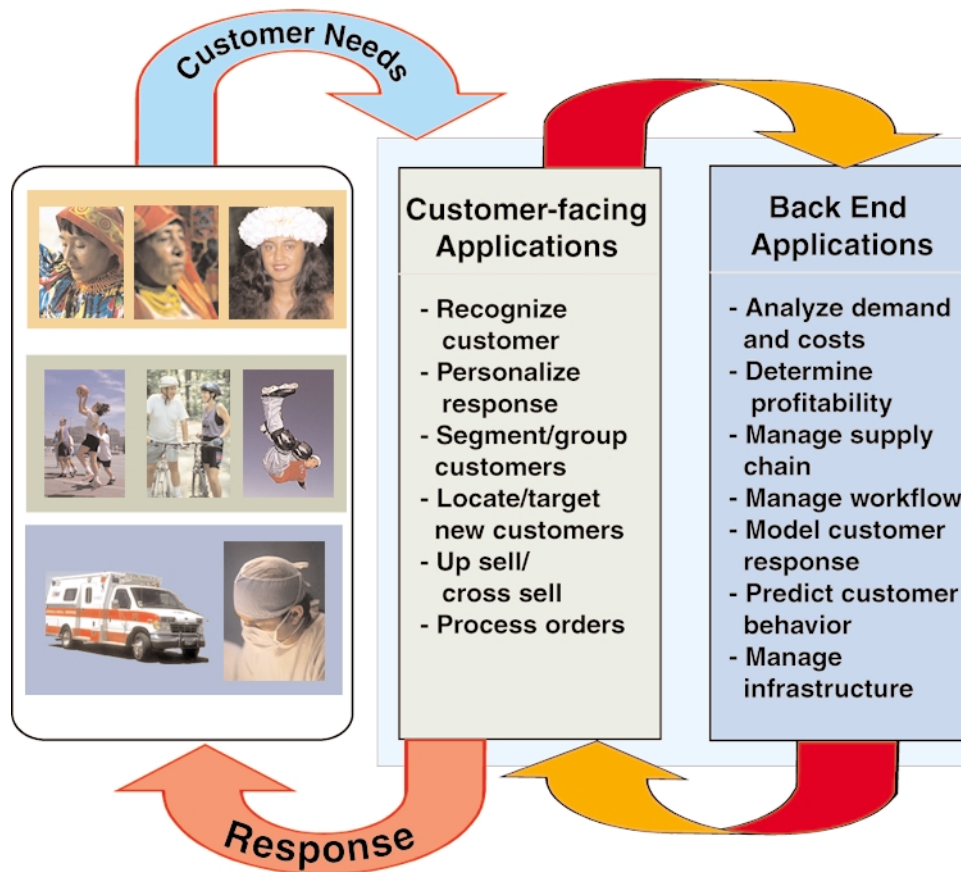
How is location-specific information integrated into CRM? The broad answer is that location is the primary tie between an information system and the customer's real world. Consequently, location-specific information can be part of most components of an information system that supports CRM.

To better understand the specific roles of location-specific information, it is helpful to consider the general flow of information through a CRM process and the role of location-specific information. Figure 2 illustrates typical front- and back-end CRM processes that a company executes in response to customer needs. As a company iterates this closed-loop process, it accumulates knowledge and, hopefully, responds increasingly well to each customer interaction.

Each application shown in Figure 2 can either use or generate location-specific information for the next. Location-enabling each application requires component-based and Internet-enabled tools — something that MapInfo has focused on for the last several years.

The examples of how location-specific information can be used in CRM are as varied as the businesses that use it. In the following sections, we will discuss examples from two major categories: front-end applications, with an example from sales and marketing, and back-end applications, with an example from customer service.

Figure 2
Value Added by Location-Specific Information Within a CRM Process



Source: ISSI/IDC, 2000

Front-End Application: Sales and Marketing

The importance of location-specific information has long been recognized within most sales and marketing activities. Sales force automation, database marketing, and demographic analysis are examples of location-specific applications that have been integrated into CRM. Now, as part of a CRM system, location information can enhance sales and marketing activities that range from measuring customer potential, to precisely targeted marketing, to matching customers to brick-and-mortar locations or infrastructure.

For example, AT&T's Growth Markets division — an \$8 billion unit of the \$25 billion Business Services division of AT&T — sells in the multibillion-dollar medium-sized business market. This market's highly competitive nature mandates that AT&T find ways to increase the capture of new revenue rather than rely primarily on recurring revenues as its source of growth. To do this, the

Growth Markets division is deploying a business intelligence, data mining, and spatial analysis solution called the Attack database.

With business customers receiving an average of three calls a day from communications service providers, AT&T recognized that each customer interaction had to be focused and meaningful. To do this, the company needed be able to present the right amount of internal and external information to account representatives (AR) in a way that illuminated individual customer solutions. The system needed to be able to identify and prioritize solutions based on revenue potential. AT&T also wanted to be able to advance its sales more quickly and increase the speed with which it gets its services to market.

To meet these business objectives, Growth Markets deployed the Attack database. Attack brings together several sources of customer and network data and allows

field forces and sales management to create reports and maps that visually highlight areas of greatest revenue potential and the customers within those areas. Attack uses MapInfo technology and the Internet to distribute mapping functionality. In addition, it uses tools, such as thematic mapping, layer control, and spatial selection, along with online analytical processing, to help sales individuals locate and prioritize opportunities in a way that makes sense to the individual AR.

As shown in Figure 3, the user interface is a simple visual metaphor that highlights AT&T's fiber and wireless infrastructure overlaid with the best potential customers.

"The mapping software really allows you visually to look at where the opportunities lie in your market," said Joe Palazola, Growth Markets application development

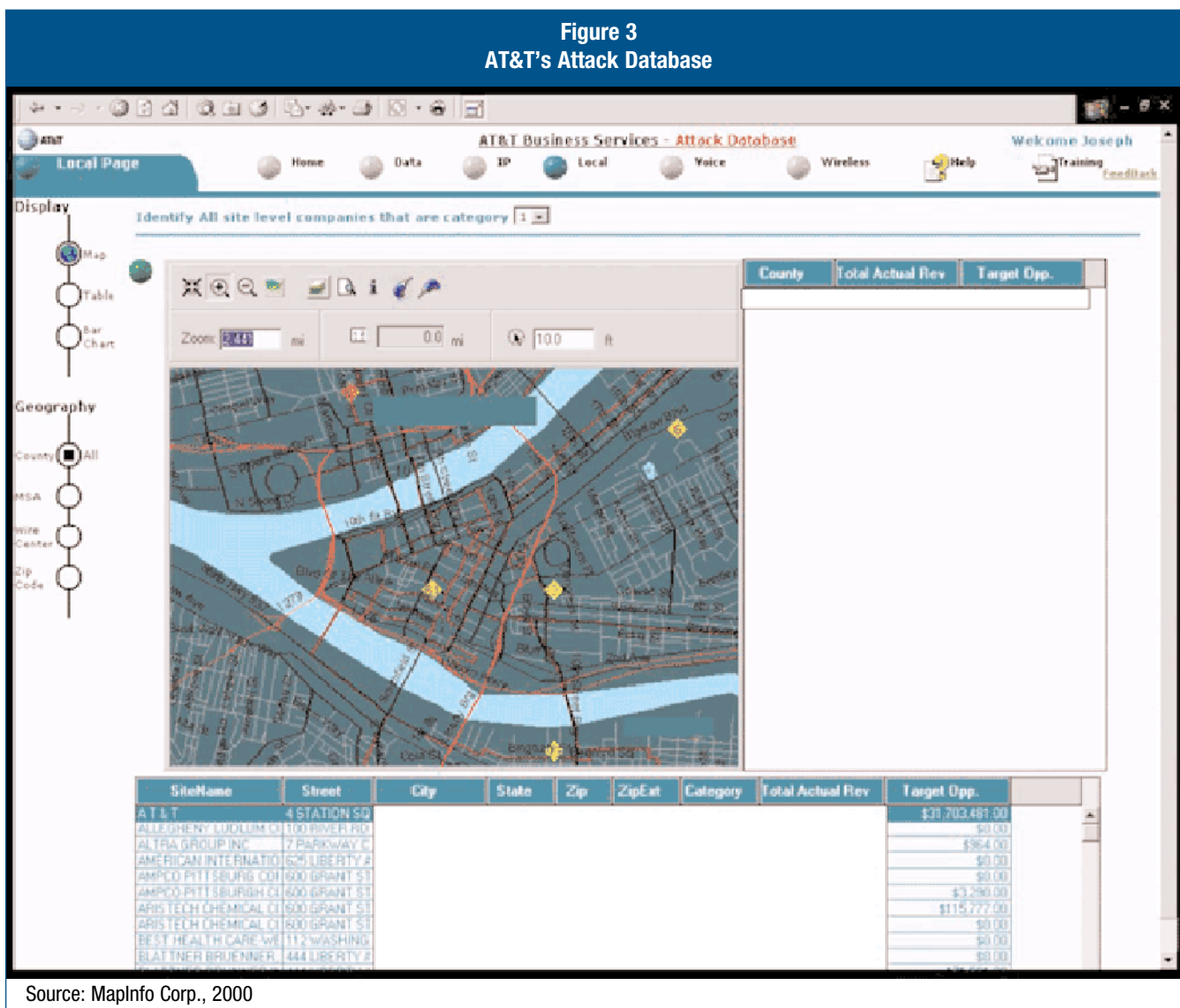
manager. "By color coding the opportunities, we are able to reference the revenue thresholds of a particular opportunity so that we're immediately giving account executives a clue as to which opportunity on the map they should work first, based on the revenue potential out at that particular customer site.

"Because the Attack database has been so successful, other AT&T business units are beginning to look at integrating Attack data into their information system," said Palazola.

Back-End Application: Customer Service

Customer service is increasingly a differentiating competitive factor in the battle to build sustainable customer relationships. Information about location of the customer

Figure 3
AT&T's Attack Database



Source: MapInfo Corp., 2000

and the company's service resources is a critical element in delivering effective customer service.

As an example, consider the problem of dealing with customer complaints about cell phone service. If a customer cannot make a call or has a call dropped, he or she wants immediate service. The phone company wants to identify the source of the customer's problem and correct it as soon as possible. The phone company has to manage this process at a regional level that involves millions of customers and thousands of cell sites.

MapInfo has developed a solution, Coverage Locator, that lets a phone company match a customer's current location within the company's cell coverage. As shown in Figure 4, each customer service representative (CSR) has an online application that shows the current customer's record, available service, and a drill-down function that accesses related customer data. The CSR can take the

customer's complaint and enter a trouble ticket for action by maintenance crews — all from one system.

This kind of one-to-one service represents a significant competitive advantage, letting companies maintain a personal relationship with each customer.

Technology Perspective

Technology is a fundamental enabler for building long-term customer relationships. This is because an organization must be able to interact with its customers where and when they want, remember them individually, understand and even anticipate their needs, and ultimately customize a solution. In addition, these capabilities must be interconnected in a closed-loop process (see Figure 5) to support continuous improvement of the relationship between the customer and the organization.

Figure 4
MapInfo Coverage Locator Application

MapInfo Coverage Locator

Find Location

Address: 41 Madison Ave

Cross Street:

City: New York State: NY

Zip: 10010 Zip4:

Find Clear Fields

Coverage Info

Coverage: Wireless Coverage Select

Enter Trouble Ticket

CustomerID: 12537

Problem: No Signal

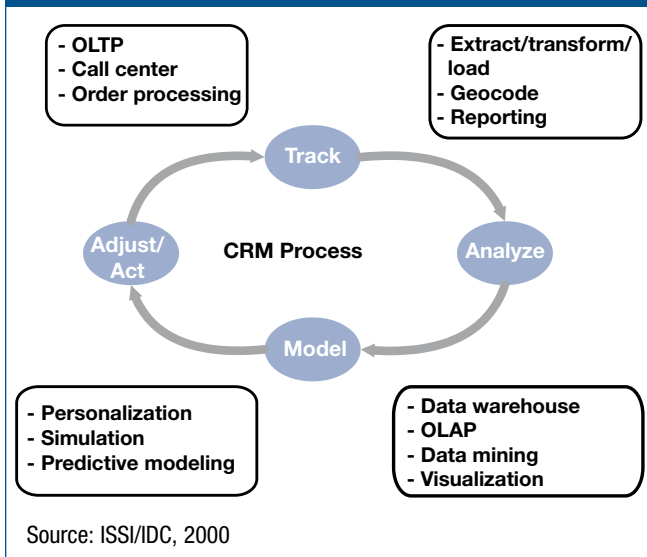
Date/Time: 05/31/2000 (mm/dd/yyyy) 10:52 AM (hh:mm AM/PM)

Comment: Battery is at full strength. No SVC on LCD in wide open area.

Enter Trouble Ticket Reset Fields

Source: MapInfo Corp., 2000

Figure 5
Location-Specific Capabilities Within
a Closed-Loop CRM Process



In a closed-loop process, information from each step provides basic information and added knowledge for the next. Ideally, as the organization cycles through the process, it builds on the knowledge from previous iterations and improves its response to each customer.

Location-Specific Functionality

All major activities in a CRM process can have a location-specific component. However, what particular functionality does location-specific technology add? These capabilities fall within the following five categories.

- **Geocoding.** Geocoding is the process of matching addresses with a geographic coordinate such as latitude/longitude. Geocoded addresses can be used for spatial operations such as calculating distance between points or finding addresses within a boundary. Generally, geocoding also requires some address cleaning and standardization. MapInfo's MapMarker is a good example of a geocoding product.
- **Visualization.** We visualize data through the combined use of points, lines, numbers, words, symbols, shading, color, and a coordinate system. In the case of geographic data, we use a coordinate system that links the data to the real, physical world. At its most basic level, spatial technology simply adds geographic coordinates to the visualization process.

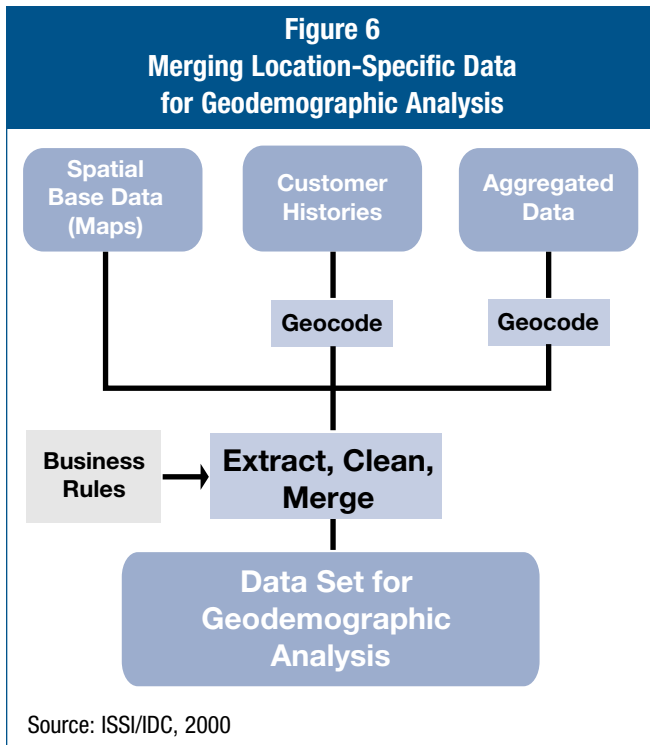
Some location-specific applications also support cartographic methods for producing maps.

- **Spatial analysis.** Location-specific information lets us perform a wide range of analysis that is difficult to achieve any other way. For example, we can answer simple questions such as "How many of my customers live within five miles of my store?" This is an example of a point in polygon analysis. Other spatial analysis methods include adjacency, line in polygon, buffering, polygon in polygon, and proximity analysis. Once the domain of specialized GIS applications, spatial analysis tools are now capabilities in tools such as MapXtreme, MapBasic, and the standard query language, SQL3.
- **Routing and address finding.** In this category, the basic questions are: "What's the quickest way to get from where I am to where I want to go?" and "Where is this address?" Routing and address-finding applications answer these questions to provide information that ranges from simple driving directions to the complex routing and scheduling for fleets of vehicles. These same capabilities are at the center of dispatching, emergency preparedness, workflow, and customer service applications.
- **Geodemographics.** Today, businesses can acquire a wide range of aggregated data including buying patterns, purchasing behavior, psychodemographics, and traffic patterns. Businesses can also collect historical data for each of their customers. As shown in Figure 6, we can combine spatial data with individual customer histories and aggregated data to create a merged data set for geodemographic analysis. This kind of analysis can be used for diverse applications that include: lead generation, sales force automation, targeted marketing, and the location of our next customer.

Emerging Market: Wireless Location-Specific Services

IDC believes that wireless location-specific services represent a new and effective way to interact with customers and to support business processes.

Today, it's hard to find a newspaper or magazine that doesn't have at least one article mentioning *wireless* and *Internet* together. Telecommunications companies are spending billions to create wireless infrastructure for access through the Net. Companies such as AOL,



Qualcomm, IBM, and Microsoft are spending billions to assemble the applications for access through the Net. AOL, for example, recently paid over \$1 billion for MapQuest.com, a company that provides location-specific information over the Net.

As issues surrounding standards, privacy, and security are resolved, the market for wireless location-specific services will grow rapidly for the following three specific reasons:

1. **Differentiation.** By adding location-specific capabilities, telecommunications companies can offer their subscribers new and attractive services. Operators that do so can compete from a more favorable strategic position, reducing churn and creating added value in the form of new services.
2. **Reduced costs.** Telco operators that introduce location-specific capabilities can optimize their systems to trace unsuccessful calls. With location-specific information, they can adapt their networks without waste or overdimensioning to match calling patterns.

Telcos can also reduce costs by reducing fraud. While telecommunications companies have a number of options for identifying fraudulent calls, they must

have location-specific information about a call to direct law enforcement people to the caller's location.

3. **Increased revenue.** We see a number of applications for location-specific information that can increase revenue for both telecommunications companies and general business. The following categories are some examples of the many kinds of applications:

- **Information services.** Information services make use of an information database in which information is filtered according to the relative position of a user and the applications he or she has selected. Examples of information services include location-based yellow pages, events, and attractions (e.g., “What is happening today in town near here?”).
- **Tracing services.** Different services can use location-based information to trace mobile devices, to provide safety, to prevent theft, to facilitate delivery, and so on. Examples of this kind of service include the tracing of a stolen car, helping paramedics to locate persons quickly in an emergency situation, and giving a towing service or automobile repair shop the location of a motorist in need (e.g., out of gas, flat tire, dead battery).
- **Resource management.** Resource management applications are used to manage the logistics of vehicle fleets, freight, and service staff (e.g., repairmen with different skills and qualifications). Examples of resource management include taxi fleet management, the administration of container goods, and the assignment and grouping of railway repairmen.
- **Navigation.** Navigation applications are used to inform subscribers how they can best move from point A to point B. Applications of this kind can be adapted to vehicle or pedestrian navigation.

We believe that innovative companies will implement all of these applications and expand location-specific technology to applications not yet imagined or conceived in practice today.

MapInfo's Business Strategy

MapInfo positions its software as complementary to mainstream database, analytic, and CRM software that seek to integrate spatial technology into their applications. This positioning allows MapInfo to focus on its core spatial competencies while letting its partners deliver spatially enabled solutions to virtually any business that deals with or uses data that includes location information.

In its corporate mission, MapInfo lays claim to the industry-leading position in customer-focused solutions that leverage location-specific information. MapInfo has been able to further its mission through a business strategy that creates a competitive advantage for its partners and customers. This strategy involves the following components:

- Partnerships.** MapInfo positions its software as complementary to mainstream database, analytic, and CRM software that deal with customer information. The company has developed significant relationships with a number of mainstream vendors that extend its reach into a wide range of markets and customers. Its partners include the leading vendors within each industry segment, including Oracle, IBM, Informix, Microsoft, and telecommunications infrastructure providers.
- Robust product line.** MapInfo has developed a deep set of solutions that encompass spatial analysis, visualization, map creation tools, and data products. Its product line specifically addresses the needs of business customers.
- Integration and technology architecture.** MapInfo has developed a consistent technology architecture across its product line. Using Java and other open technologies, MapInfo ensures that all its products work well together within business information systems.

To date, MapInfo's financial performance indicates that its strategy is working. Since early 1998, MapInfo has been able to outpace the traditional GIS market and is currently showing a 30% year-to-year growth rate. In contrast, the traditional GIS market growth rate is about 5%, well below more vigorous information technology sectors.

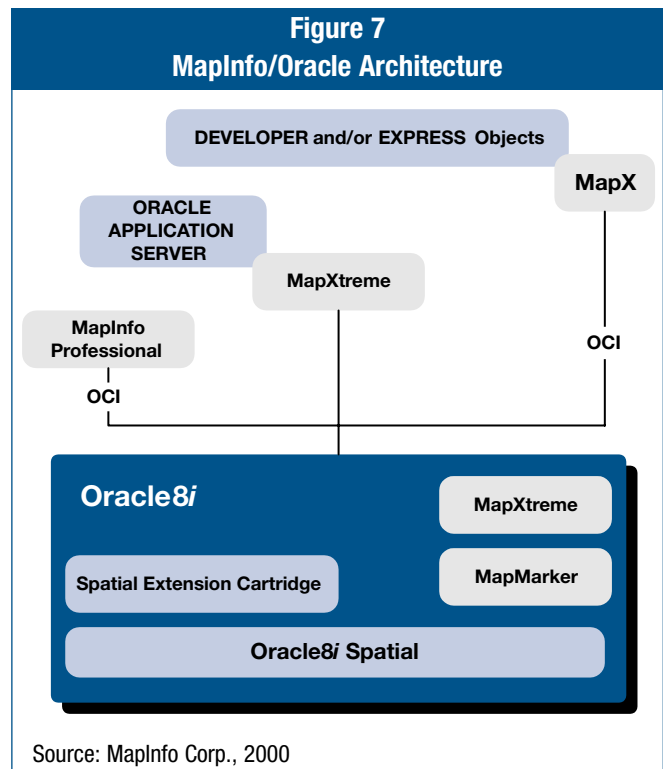
Oracle Partnership

MapInfo's relationship with Oracle is a good example of its partnering, technology, and integration strategies. MapInfo has positioned itself as complementary to Oracle. The MapInfo/Oracle alliance involves two major joint efforts: One effort is primarily technical, and the other is primarily a business relationship.

On the technical side, MapInfo and Oracle jointly developed ISO spatial data types, spatial operators for Oracle8i. Oracle will be licensing MapInfo's projection management and coordinate system technology for future versions of Oracle Spatial. Oracle is helping MapInfo optimize its products, such as MapInfo Professional and MapX, to run with Oracle databases.

Within the product architecture, illustrated in Figure 7, MapInfo and Oracle have developed a spatially enabled platform based on Oracle Spatial and the Oracle8i Internet Platform to enhance online business solutions for CRM, ecommerce, and data warehousing applications. MapInfo has tightly integrated its MapXtreme and MapMarker products into the core Oracle8i server for maximum performance.

On the sales side, the relationship between Oracle and MapInfo includes new products, delivery and consulting



services, and cooperative marketing activities as well as technology licensing and application development.

Drivers and Constraints

The following factors will tend to accelerate or constrain the use of location-specific information in CRM systems.

Factors That Will Tend to Accelerate the Use of Location-Specific Information

- **Growth of customer-oriented business processes and supporting CRM applications.** The trend toward customer-oriented information systems is well established. As a reflection of this trend, IDC expects the overall CRM applications market to grow at 37% annually through 2004. This rapid growth will drag the growth of location-specific technologies at about the same rate.
- **Availability of spatial technology within databases, analytic, and CRM applications.** About two years ago, we surveyed 15 of the top 20 analytic applications vendors to determine their acceptance of spatial technology. Three of the 15 had plans for including location-specific capabilities within at least some of their products. In November 1999, we surveyed the same group and found that all 15 now have a spatial strategy. All but 2 of the 15 either were using or planned to use MapInfo technology.

MapInfo is also driving this trend in telecommunications faster than any other spatial technology vendor. The company has built significant relationships with infrastructure providers (Lucent and Alcatel); carriers (Sprint PCS, AT&T Wireless, and Telia); and ecommerce providers (Found Inc., NearMe, Vectiv, Beyond.com).

All the major database companies either now support spatial data or will in the near future. Currently, the MapInfo/Oracle team appears to have the lead in this area. We expect other vendors, particularly ESRI, to accelerate their efforts with the database vendors. This increased activity will contribute to the overall acceptance of spatial technology in the database sector.

Based on activity among database, analytic applications, and CRM vendors, we expect the trend toward greater availability of spatial technology and location-specific information to accelerate significantly over the next 24

months. While it is too early to project revenue growth rates for spatial technology, we expect the growth to be similar to growth in the sectors that use the technology.

Factors That Will Tend to Constrain the Use of Location-Specific Information

- **Market acceptance roadblocks.** Do companies have the vision to apply spatial information for segmentation, customer retention, buyer behavior, and other types of CRM applications? MapInfo has described several scenarios in which this capability would be valuable, and it has a number of successful telecommunications customers. However, most mainstream buyers still need to be introduced to the concepts of location-specific information and convinced of its benefits in CRM — an expensive process.
- **Technological roadblocks.** IDC believes that significant technological hurdles need to be overcome before location-specific information will be widely implemented within CRM systems.

We see good progress in the integration of spatial and nonspatial data into a common database. The progress that MapInfo and Oracle have made is the leading example.

However, a number of technical obstacles must still be overcome within other technology sectors. First, integrated location/attribute data needs to be easily handled within the full range of transaction processing and analytic applications that make up CRM systems. This means common, consistent access to location-specific customer records across all CRM applications. Currently, the necessary standards and conventions for this consistent access are not adequate.

Finally, companies must implement vertical applications that use location-specific information for the company's unique problems. These problems must be well understood by vendors before the vendors can package the technology into vertical applications.

Conclusion

In concept, MapInfo's strategy is simple: The company must build on its current core competencies and its relationships with database, telecommunications, CRM, and analytic applications vendors to exploit the CRM market. In practice, MapInfo will have to execute a

complicated set of technical and marketing plans to be successful. It will also have to fight off increasing pressure from companies that see the market opportunity in location-specific CRM.

Given the high growth rates in the CRM market and the powerful utility of location-specific information, we believe that location-specific CRM applications represent an excellent opportunity. Given MapInfo's track record in executing its business strategy and its current situation with Oracle and other CRM technology vendors, we believe that MapInfo is the company to watch in location-specific CRM applications.