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# Enterprise Location Intelligence

## Bringing Location-related Business Insight to Support Better Decision Making and More Profitable Operations

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# Enterprise Location Intelligence

Bringing Location-related Business Insight to Support Better Decision Making and More Profitable Operations



## ABSTRACT

IT IS NO LONGER A QUESTION AS TO *WHETHER* LOCATION INTELLIGENCE WILL BE INCORPORATED AS PART OF THE ENTERPRISE INFORMATION ARCHITECTURE, BUT RATHER *HOW SOON* LOCATION INTELLIGENCE WILL BECOME UBIQUITOUS ACROSS THE APPLICATION ENVIRONMENT. LOCATION INTELLIGENCE BLENDS THE ANALYSIS OF OBJECTS WITH THEIR SPATIAL ATTRIBUTES TO PROVIDE POWERFUL CAPABILITIES THAT CAN BE INTEGRATED WITH BOTH OPERATIONAL AND ANALYTICAL APPLICATIONS FOR MULTIPLE USES THROUGHOUT THE ENTERPRISE.

# LOCATION INTELLIGENCE CAPABILITIES CAN HELP INCREASE REVENUES, DECREASE COSTS, AND IMPROVE PRODUCTIVITY



## The Value of Location

The growing popularity of mapping web sites and handheld GPS (Global Positioning Satellite) devices is indicative of the continuing recognition of the value of *location*. And even with the growth of online shopping and virtual commerce, all business transactions and events still take place with the parties located at some physical location. Clearly, the nature of business transactions and events is influenced by location as well as the associated demographics of the participating parties. And as commerce transitions to the World Wide Web, the corresponding growing volume of data related to the location of events and transactions can be analysed in ways that will contribute business insight among a variety of operational and analytical dimensions, including influencing consumer behavior, analysing risk, identifying credible threats, evaluating tax dependencies, allocating relief funds, planning strategic military deployment, and many other ways of generating positive business value.

## What is Location Intelligence?

Location intelligence blends the analysis of objects (such as people, businesses, points of interest, or geographic regions) with their spatial attributes (such as average age, median income, average driving distance, or average educational attainment) to inform decision-making for operational efficiencies, revenue growth, or more effective management. These location intelligence capabilities can be integrated with both operational and analytical applications to help increase revenues, decrease costs, and improve productivity and satisfaction:

- **Geocoding** – As the fundamental location intelligence service, geocoding maps a named location (such as an address) to specific latitude, longitude (and potentially altitude) coordinates on the earth's surface. Geocoding service may extend beyond address mapping; given a data base of named locations and other points of interest, a geocoding service could map any number of places to their location coordinates, including airport or railroad station codes, named points of interest, a street intersection, or even analysing text to extract place names descriptions.
- **Reverse Geocoding** – Alternatively, the service can perform the reciprocal operation of reverse geocoding: providing the nearest address or point of interest given a set of latitude and longitude coordinates.
- **Address Cleansing and Standardisation** – parsing and standardising street, city, and state information allows an address cleansing service to match against third-party data to ensure that records meet published standards for postal addressing.
- **Geographic Data Enrichment** – Many of the business drivers for location intelligence rely on combining location information with auxiliary data sets to enable risk assessment, identification of taxing authorities, and standardised representations of regional hierarchies (such as place/township/city/county/state). Matching cleansed addresses against geographically-enriched data sets appends additional information (such as address corrections, demographic data imports, psychographic data imports, and household data) in ways that enable downstream analysis that will inform business decisions.
- **Mapping** – A mapping service essentially combines the geocoding capability with reporting and visualisation to allow identification and tracking of the locations at which business transactions occur. A mapping service relies on geocoding to transform a conceptual location (address, point of interest, etc.) to its coordinates and then locate where the position of those coordinates on a map, as well as allowing for editing, analysing, and displaying value-added associated data on a map.
- **Distance** – There are different ways of figuring out the distance between two points, with the most basic being the "straight line" (also known as Euclidean) distance. However, there are potentially many different types of distance, such as driving distance, driving

time, minimal traffic lights, most fuel-efficient, etc. Distance calculations support proximity matching and searches for close-by points of interest.

- **Routing** – Routing leverages geocoding and distance calculations and helps plan the trip among a collection of two or more points. This service looks at different distance calculations to present the most efficient paths under specific circumstances, using different weighting factors such as direct distance, driving distance, drive time, number of traffic lights, number of turns, speed limits, and even real-time traffic reports and then present the best route based on the user's specific criteria.
- **Proximity Matching** – Proximity matching searches for relevant objects and points of interest within a defined radial range. Proximity matching can find relevant points of interest near specified coordinates or even named locations, and uses a knowledge base of categorised points of interest (such as "hotels," "restaurants," or "airports") to provide a list of matches within the closest vicinity.

## Putting Location Intelligence in Place

Business applications typically use geographic data analysis functionality to pinpoint places on a map or presenting directions among a set of locations. But more and more, location intelligence techniques are used to answer questions regarding spatial relationships that go beyond just putting points or drawing lines on a map.

Fundamental location intelligence services include operational uses such as address cleansing and standardisation, mapping, distance calculations, calculating nearest points of interest, risk assessment, real-time traffic and routing updates, and emergency or accident routing. In addition location intelligence can be used for analytic purposes such as geographic targeting, fraud detection, site location, risk assessment and determination of premiums for insurance, dead zone analysis for telecommunication utilities, among others.

Some examples include:

- **Proximity Analysis** – Real-time proximity analysis builds on geocoding to benefit a variety of business processes, ranging from consumer-directed activities such as finding closest points of interest (including hotels, restaurants, or entertainment), to expediting call routing and providing emergency assistance by determining locations for emergency calls, routing to the proper authorities, and directing roadside assistance, police, or emergency medical staff, especially for locations unreachable by standard emergency vehicles.
- **Eligibility and Service Provision** – Many service providers and utilities may be limited in providing service based on the proposed service location. There may be physical limits that need to be analysed, such as a residence's distance to a central office for DSL internet service, or whether a residential area is served by public water and sewage systems or if a service location is served by existing power lines. Location intelligence also contributes to alternate operational processes with geographic dependence. Other examples include assessing residential properties to forecast investment requirements in utility infrastructures or determining which businesses are within areas that qualify for government subsidies for economic development.
- **Geographic Targeting** – Understanding the demographic characteristics of prospects within different regions enables generalised targeted marketing, which employs geocoding coupled with data enrichment to optimise targeted communication to individuals within specific locations. Web advertisers often populate their content based on the location of the IP addresses of their web site visitors, while print media, radio, and television content providers may localise their direct advertising.
- **Reducing Costs via Increasing Mailing Accuracy** – Parsing, standardising, and correcting addresses provide discrete benefits. First, when postage rates are

## LOCATION INTELLIGENCE TECHNIQUES ARE USED TO ANSWER QUESTIONS THAT GO BEYOND JUST PUTTING POINTS ON A MAP



reduced for high volume mailings with standardised addresses (including bar codes) correcting and addresses so that they meet defined postal standards usually reduces mailing costs. Simultaneously, ensuring high quality and accurate addresses eliminates the risk of expenditures on undeliverable or incorrectly delivered mail. In addition, increased mailing accuracy leads to increased opportunities, as it helps to target accurate delivery with greater precision, resulting in more pieces reaching the intended audience, thereby increasing prospect and customer response rates.

- **Site Location** – Even with a large degree of business migrating to the World Wide Web, many different industries (including retail, banking, healthcare, and hospitality, as well as public sector and social services) still rely on physical facilities. Location intelligence is used in considering how the different characteristics of proposed locations are aligned with the organisation's business needs. Retail organisations may classify site desirability based on centrality and accessibility within a region whose residents share certain demographic and behavioral attributes. Wireless communication companies must both analyse "dead zones" with interruptions in continuous service while simultaneously looking for appropriate tower sites based on zoning, local permitting constraints, and community restrictions for utility facilities.
- **Asset Allocation and Management** – Networked organisations that utilise multiple facilities (such as universities, retail chains, health care networks, and hospitality companies) must maintain the physical buildings, manage activities and operations (such as deliveries, utilities, or waste management) as well as the assets (such as desks, beds, computers, etc.) located within those buildings. Knowing the location of each facility and asset benefits the organisation when it comes to planning, maintenance, ensuring consistent rental rates and continuous occupancy, as well as optimised goods and services procurement (such as better pricing enabled by collective purchasing arrangements for locations in close proximity).

Location intelligence provides benefits within specific industries as well. Some examples include:

- **Crime Analysis and Fraud Detection** – Location is of particular interest for the purpose of analysing and preventing crime, and location intelligence is used in a number of scenarios. One example involves locating and tracking persons of interest such as terrorists, drug dealers, money launderers, and others involved in criminal or regulated activities for the purposes of observation and monitoring. Another area centers on fraud in which location data is combined with transaction data to identify unusual patterns indicative of fraudulent behavior such as identity theft, stolen credit cards, and even insurance or public assistance fraud.
- **Insurance** – High quality geographic information is critical to the insurance industry, as risk is typically tightly coupled with location. Home policy premiums are influenced by situation within natural hazard zones, while insurance companies seek diversification of both core products within the same regions as well as market distribution across different regions. Location data is necessary to complete the underwriting process and informs operational activities such as balancing exposure to aggregate risk across different areas, catastrophe management, assessing theft and damage potentials, and regulatory reporting to governmental agencies and commissions.
- **Logistics** – Two key directives within the logistics and delivery industry are improved efficiency and reduction in risk. Location intelligence addresses both of these drivers by increasing delivery speed by providing directions to high quality standardised addresses and calculating the optimised routing based on a collection of performance distance measures, such as delivery routes calculated based on shortest distance can increase fuel efficiency. Risk can be reduced by planning routes in which the delivery point is always positioned to the right of the vehicle, which reduces the risk of driver accidents.

These are but a small set of examples of how location intelligence has become a critical aspect of operational and analytical business processes.

## Location Intelligence and Trustworthy Data

There are two considerations regarding the quality of enterprise data to take advantage of location intelligence. First, the kinds of dimensional analyses provided by data warehousing and business intelligence depend on enterprise reference data that conforms to well-defined quality expectations. Standardised reference hierarchies, high quality point of interest names, locations, and addresses are critical to organising the right analysis methods. Second, applying location intelligence to guide profitable action requires organisational data sets to be of measurably high quality.

Repurposing existing data sets will introduce new data and information quality requirements that may not be met by the upstream data suppliers, requiring additional integrated data quality techniques. This means that one cannot rely on standalone tools for geographic analysis. Instead, location intelligence service must be tightly coupled with the enterprise information management architecture. In other words, anyone considering location intelligence should align that strategy with best practices in data quality management and data quality tools.

## Establishing Location Intelligence Services

It is no longer a question as to *whether* location intelligence will be incorporated as part of the enterprise information architecture, but rather *how soon* location intelligence will become ubiquitous across the application environment. One approach involves integrating vendor products that implement location intelligence using a *services-oriented approach* that is equally easy to incorporate into both operational and analytical applications.

Taking location intelligence to the next level means acquiring location intelligence services, and vendor products can be evaluated based on the degree to which they meet business application needs. Some considerations include core functionality (such as geocoding, distance calculations, mapping, routing, address standardisation, and advanced spatial analytics), ease of use, alignment with data integration and data quality tools and technologies, data enrichment, as well as functional integration and application interoperability. Encapsulating location intelligence services in a way that supports a broad capability will simplify the integration of geographic data services with analysis, reporting, and visualisation tools, which increases ease of use while reducing complexity.

FOR MORE INFORMATION ON LOCATION INTELLIGENCE SOLUTIONS, CALL PITNEY BOWES BUSINESS INSIGHT TODAY OR VISIT OUR WEBSITES.

## A LOCATION INTELLIGENCE STRATEGY SHOULD ALIGN WITH BEST PRACTICES IN DATA QUALITY MANAGEMENT AND DATA QUALITY TOOLS



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