

Enterprise Geocoding Module - India

ENTERPRISE LOCATION INTELLIGENCE

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Enterprise Geocoding Module - India

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ABSTRACT

THE IMPORTANCE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) IN MODERN SOCIETY IS CLEAR, GIS IS NOW TOUCHING ON ALL AREAS OF SOCIETY FROM THE ENVIRONMENT, TO TRANSPORTATION, GOVERNMENT, ENTERPRISE AND THE GENERAL PUBLIC.

70% OF BUSINESS DATA CONTAINS A GEOGRAPHIC ELEMENT AND PITNEY BOWES SOFTWARE GEOCODING TECHNOLOGY IS THE BEST OPTION FOR PROVIDING ACCURATE LOCATIONS. THE GIS MARKET IN INDIA IS ROUGHLY 6.2 BILLION USD AND IS QUICKLY GROWING. IT IS IMPERATIVE TO HAVE A PRODUCT WHICH PROVIDES ACCURATE GEOGRAPHIC LOCATION TO ENSURE CUSTOMER SUCCESS.

GEOCODING INDIAN ADDRESSES IS QUITE CHALLENGING. IN INDIA, THERE IS NO STANDARD FOR ADDRESSES; HOWEVER THERE IS A BUSINESS NEED FOR AN ENGINE WHICH CAN GEOCODE INDIAN ADDRESSES. PROVIDE LATITUDE AND LONGITUDE TO THE HIGHLY UNSTRUCTURED INDIAN ADDRESSES WITH MATCH RATES, COVERAGE, ACCURACY AND PERFORMANCE, WHILE SATISFYING THE BUSINESS NEEDS OF THE MOST DEMANDING CUSTOMERS.

SPECIFICALLY, THE FOLLOWING CHALLENGES ARE QUITE APPARENT:

- THERE IS NO GOVERNMENTAL DATA AVAILABLE FOR REFERENCE.
- THE DATA IS STILL EVOLVING IN A QUICKLY GROWING COUNTRY.
- THERE ARE NO PROPER ADMINISTRATIVE DIVISIONS IN INDIA.
- THERE IS NO STANDARDIZATION OF ADDRESS STRUCTURE ACROSS THE COUNTRY, AND EVEN WITHIN STATES.
- WITH 22 DIFFERENT LANGUAGES, AND 30 STATES, THE CHALLENGE IS SIMILAR TO CREATING 30 DIFFERENT COUNTRY GEOCODERS.

THE ENTERPRISE GEOCODING MODULE - INDIA FROM PITNEY BOWES SOFTWARE PROVIDES SOME OF THE MOST ACCURATE MATCH RATES AVAILABLE TODAY. THIS IS A UNIQUE SELLING PROPOSITION TO THE ORGANIZATIONS WHICH ARE BANKING ON THESE ATTRIBUTES TO MAKE CRITICAL BUSINESS DECISIONS.

THE GIS MARKET IN INDIA IS ROUGHLY 6.2 BILLION USD AND IS QUICKLY GROWING

INDIAN FACTS

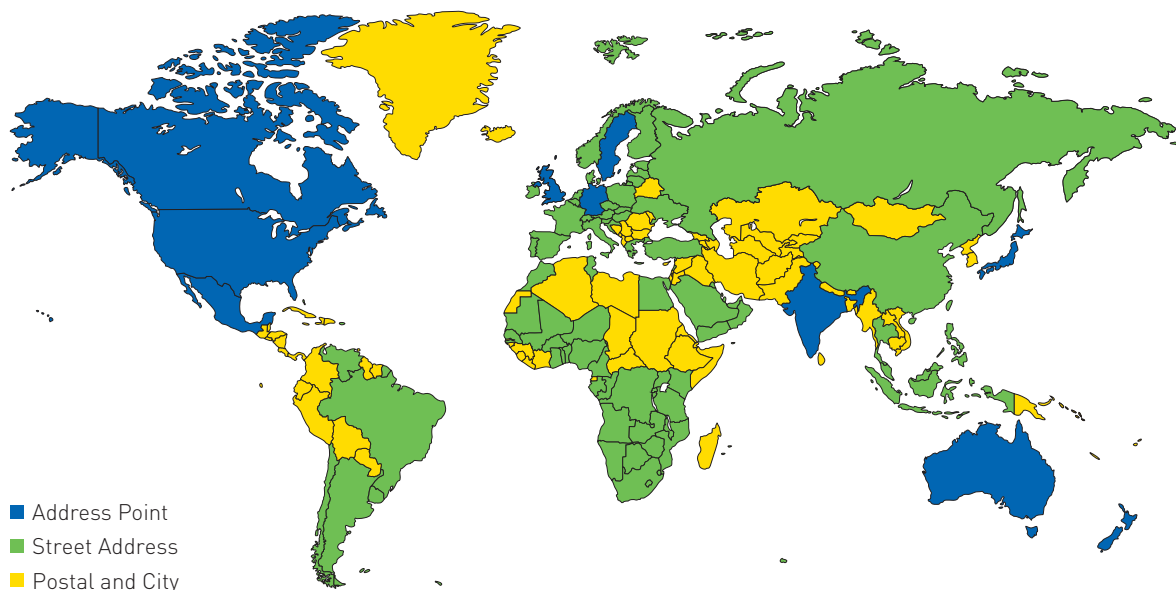
- 35 States & Union Territories, ~650 Districts, ~6,000 Tehsil/Town, more than 30,000 postcodes
- 21 regional, two official (Hindi & English) languages
- 3.2m sq. km area
- 1.2 billion population
- Administrative Hierarchy
 - State >>District>>Tehsil/Town>> Ward>>Locality/Village>> Sub locality>>Block/Pocket
- Address Format Examples
 - Near Govt. Hospital, Zirapur, District Rajgarh (MP)
 - 351 Ground Floor, Shakti khand 3, Near St. Teresa School, Indirapuram, Ghaziabad 201010 U.P.
 - 9 Mansarovar Colony Opp. 3/686, Kala kuan Housing Board Alwar 301001
 - 9/19/98/19-D Flat No. # 303 Hitech City Madhapur Hyderabad
 - 176 Devi Nagar New Sanganer Road Sodala, Jaipur Rajasthan

Product Description

The Pitney Bowes Software Enterprise Geocoding Module - India is based upon the framework which provides highly accurate match rates and performance for almost all the countries across the globe.

The Geocoder is an engine which can provide a latitude/longitude and is accessible through a web service interface (REST/ SOAP). The engine also has the capability to provide an address for a given latitude and longitude (reverse geocoding).

The product provides single and multi-line geocoding in both transactional as well as batch mode. There are certain configurations which can be used to obtain the best match rates. Configurations can be customized. The same parameters can be passed through the REST/ SOAP call and be configured through a user interface. The solution blends a rich, hybrid dataset of administrative boundaries, settlement points, postal data, street and Points of Interest (POI) datasets with high performing algorithms; together data and software provide some quite relevant features for India.



Enterprise Geocoding Module - India

Sample Geocoding Output

The output comprises of multiple attributes which have been depicted in the following diagram. The engine formats the address and provides that as an output, provides the latitude/longitude, precision codes, confidence score, etc.

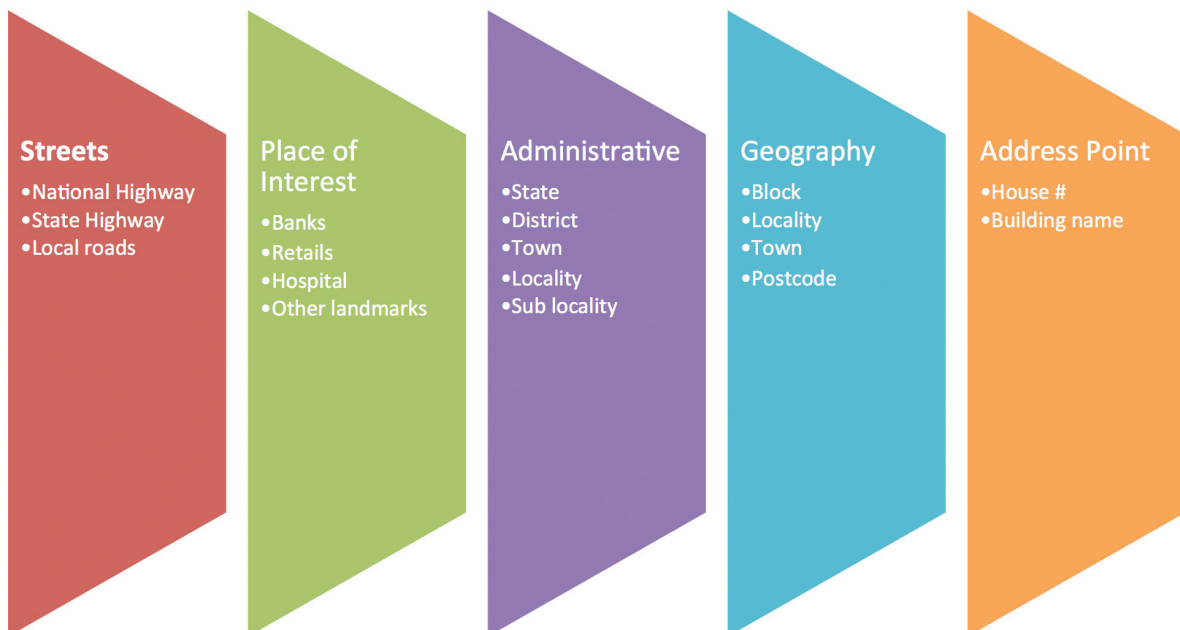
Input Addresses	Geocoding Precision Code	Confidence Level of Geocoding	Coordinates		Output Location of Address			
ADDRESS	Geocoder.MatchCode	ConfidenceCode	Latitude	Longitude	IND_SUB_LOCALITY	Locality	City	Postal Code
A-78 ABLOCK GANSH NAGAR DELHI DEL 110018 INDIA	SL-----CZA	High	28.63655	77.08747	GANESH NAGAR OLD MAHABIR NAGAR SECTOR 2	TILAK NAGAR	DELHI	110018
G FLR H NO I 5/42 SEC 16 ROHINI DELHI DEL 110085 INDIA	SL-----CZA	High	28.73288	77.1196	SECTOR 16	ROHINI	DELHI	110085
A21, Vandana Apt., Sector13, Rohini, Delhi DELHI DEL 110085 INDIA	G4	High	28.70187	77.09836		ROHINI	DELHI	
D-115 3RD FLOOR SANGAM APPTS SECTOR-9 ROHINI DELHI DEL 110084 INDIA	SL-----C-A	High	28.71486	77.12371	SECTOR 9	ROHINI	DELHI	110085
H-345,2ND FLOOR,VIKASPURI NEW DEHLI DELHI DEL 110018 INDIA	Z1	High	28.64479	77.089			NEW DELHI	110018
22/356/357 SEC 7 ROHINI DELHI DEL 110085 INDIA	SL-----CZA	High	28.70823	77.11781	SECTOR 7	ROHINI	DELHI	110085

Diagram labels pointing to the table:

- GEOCODING PRECISION CODE (points to Geocoder.MatchCode)
- GEOCODING CONFIDENCE LEVEL (points to ConfidenceCode)
- CORRECTED LOCALITY NAME (points to IND_SUB_LOCALITY)
- CORRECTED CITY NAME (points to City)
- CORRECTED POST CODE (points to Postal Code)

Data Consumed

Consuming the following data from Lepton (Local data provider) India and TomTom:

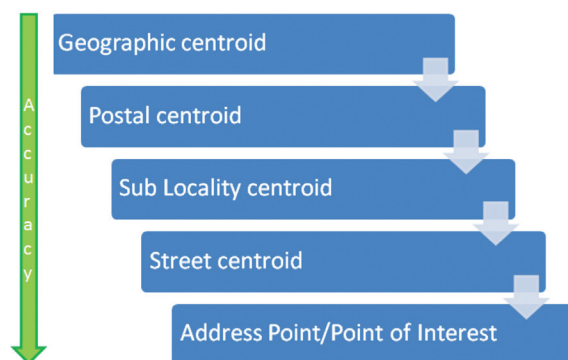


WITH SOCIAL, LOCATION AND MOBILE BECOMING THE NEW BUZZ WORDS IN THE INDUSTRY, HIGH PERFORMING GEOCODERS WILL PLAY AN IMPORTANT ROLE

Product Features

- Forward Geocoding
- Street Geocoding
- Place Name Geocoding
- Address Point Geocoding
- Sub-Locality Support
- Geographic Geocoding
- Postal Geocoding
- Reverse Geocoding
- Supports Multiple input formats

The highest level of accuracy is the Address Point. Given the address structures and patterns of India, (40% are un-named streets) Sub Locality is widely accepted by most of the customers in the Indian Market.



Sub Locality

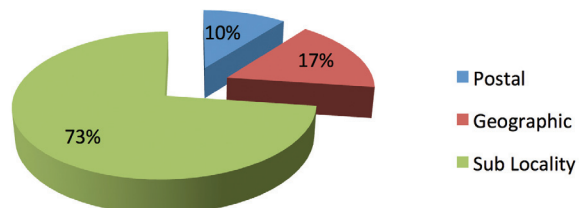
- An area which has diameter of 500 m or less is known as sub locality as per Indian administration.
- Sub locality mainly indicates block, sector and pocket and shorter area as compared to locality.

- Plays an important role in Indian geocoding in terms of accuracy and match rates.
- Sub locality is represented by 'SL' precision code.
- RSL represents the precision code for Reverse Geocoding

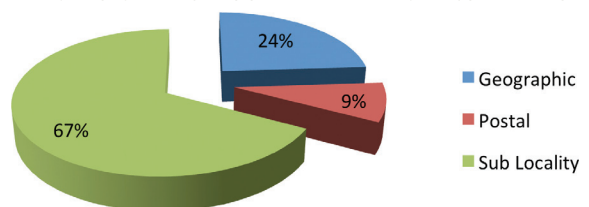
Accuracy /Match Rates and Competitive Analysis

The implementation is a PAN India implementation that has been thoroughly tested on millions of real world addresses, including records that are both clean and addresses that are ambiguous or hard to match in a geocoding environment. Considering the challenges which have been mentioned earlier, we are proud to offer one of the best geocoders on the market.

TIER 1 CITIES: HIGHLY POPULATED URBAN CITIES AND FINANCIAL HUBS OF INDIA



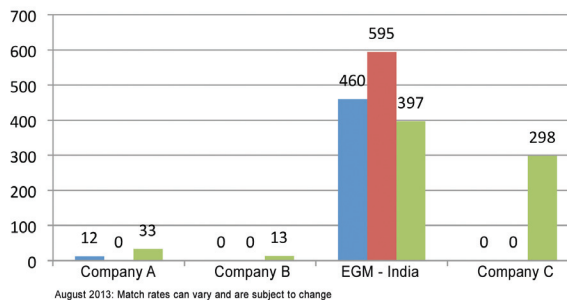
TIER 2 CITIES: MEDIUM POPULATED CITIES OF INDIA AND MEDIUM INCOME LEVELS



August 2013: Match rates can vary and are subject to change

We performed a comparative analysis, carried out with some global and local players in the market, and interestingly, the PBS Enterprise Geocoding Module - India was a strong performer. Given the complexity of the real addresses, the ability to geocode the addresses at Sub-Locality level is a good achievement. Most addresses are geocoded at the street-level or at the sub-locality level.

Enterprise Geocoding Module - India



■ ROOFTOP

ROOFTOP = POINT LEVEL MATCH, ROOFTOP INTERPOLATED = SUB LOCALITY LEVEL MATCH

■ ROOFTOP INTERPOLATED

STREET LEVEL = STREET LEVEL MATCH, GEOGRAPHIC LEVEL = GEOGRAPHIC LEVEL MATCH

■ STREET

POSTAL LEVEL = POSTAL CODE MATCH, NO MATCHES = NO MATCH/FALSE MATCH

The product is also able to geocode the addresses at the Village point level which can help in rural planning as well. The product has a strong road map and will definitely help organizations create a differentiated value proposition compared to competitors.

Business Solutions

Overall, our geocoding reliability is acceptable for typical use cases. We continue to enhance our geocoding offering based upon the evolution of data and are working to address the need for comprehensive roof top level accuracy. Once we have achieved these goals, our customers will be able to use our offering for mission critical business problems, such as risk premium calculation at the household level. We have used our product to build customized solutions for Banks, the Financial Services and Insurance segment and our Retail and Telecom customers are evaluating the technology for their vertical business problems. We believe that any business with location-enabled data will have a potential use case for this product.

As mentioned earlier, the product has helped banks make important decisions such as where to open up the next bank branch/ATM, where to deploy the agents and what is the

impact on the premiums collection due to the absence of offices in the vicinity of the customers. In this competitive world where the organizations are competing to increase their customer base and improve their customer service, exact location is playing an important role and the Enterprise Geocoding Module - India is an important component in the entire solution.

The product has the potential to solve the following needs and many more.

- Agent versus direct channel evaluation
- Agent deployment
- Demographic data overlay and customer base segmentation
- Location-based customer profiling
- Home insurance premium calculation based upon the risk of the customer base
- Online dashboard deployment of premiums to territory managers
- Real-time campaigns of the Insurance policies based upon locality and seeing the effectiveness of the same reaching out to smart phone users
- Route optimizations of the field agents – deployments
- Address validation and understanding how much revenue is lost due to missing communication
- Based upon demographic data, what is the potential of generating more revenue from a location?
- Based upon any epidemic/pandemic, the impact on the loss of premium and overall loss to the organization
- Investments required to build marketing channels
- How to build marketing collaterals specific to particular campaigns based upon location

FOR OPTIMAL INSIGHTS AND GEO-INFORMED DECISION MAKING, LOOK TO PITNEY BOWES SOFTWARE FOR THE HIGHEST QUALITY GEOCODING SOLUTIONS

- Establishing centers for premium collections
- Cross selling opportunities to the same customer based upon lifestyle segmentation of the customers

Conclusion

The market requires a product which has a high level of accuracy and coverage. This cannot be expected in a short span of time and the product will take some more time to fully mature. The data itself is in the nascent stage and will take some more time to develop. Given the diverse nature of India, data authenticity is very important. It is possible to build a geocoder on open source data such as Open Streets, but the coverage and authenticity for a country as diverse as India will be compromised and hence the decision to go with local data provider and a recognized global data provider is imperative for this product to succeed.

Different countries demand different models and India is no different; supporting transactional-based, on-demand models are imperative.

There is also no one solution to solve the geocoding needs of country like India and the models which have worked for other countries might not work here. New features have to be introduced which can really solve the business problem and this is what our PBS Enterprise Geocoding Module - India is doing. Since accuracy is of utmost importance, we have designed (and are evolving) the smartest algorithms to handle unstructured data. Our technology provides certain precision codes as a part of the response which are can be used to make decisions. Given the unique needs in India, special precision codes and confidence level are essential and that is exactly what the PBS Enterprise Geocoding Module - India is doing.

The market is ripe and is looking forward to solutions which can perform analytics based upon location. There are other freely available products in the market, but those are not good enough when there are millions of dollars at stake and companies are trying for personalized marketing, accuracy

is important. Hence a product such as the PBS Enterprise Geocoding Module - India has a decent market. With the social, location and mobile becoming the new buzz words in the industry, high performing geocoders will play an important role in that area as well.

The emerging markets, such as India, are opening up and having the largest number of Mobile users in the world will give leverage to the organizations which are trying to target their customers where ever they are with customized communication.

Pitney Bowes Software leads the market in international geocoding and reverse geocoding solutions. As a part of our modular Spectrum Technology Platform, they are easily combined with our mapping, address quality and data quality solutions for unparalleled accuracy, coverage and spatial analysis capabilities. Pitney Bowes Software's reverse geocoding coverage currently spans across 100 countries and territories around the world. Our coverage is continuously expanding into additional markets.

For more information, see the video on Pitney Bowes Software's [Enterprise Geocoding Module - India](#) or visit www.mapinfo.com.



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