Newsletter

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From the President's Desk

The use of location-based services or LBS has pervaded our daily lives now more than ever before. Not just businesses, but even governments across the world are leveraging location-based services to derive Geospatial insights and better understand patterns.

Cutting-edge LBS applications across sectors like health, retail and eCommerce, recreation, transport, and mobility, as well as entertainment and social networking are making these fields more intuitive and customer-centric. LBS also finds application in areas like fraud prevention and emergency management, and its integration with technologies like AI and AR/VR is paving the way for many more unprecedented use cases.

The increased prevalence of smartphones has further sparked this trend, extending the reach of LBS from enterprise models to local communities and individuals. The technology is bringing an entirely new era of mobile commerce into the picture, making customer experiences much more personalized. The fusion of wireless communications, network computing, the internet, and Geospatial technologies, coupled with the proliferation of mobile devices is steering the popularity of location-based services all over the world.

Advancements in Geospatial tools and technologies, therefore, are intrinsically linked with the development of location-based services. Further developments and integrations with fields like AI, IoT, and 5G will only accelerate innovations in LBS for governance, business, and service delivery.

As a forum for the exchange of ideas, techniques, approaches, and experiences by those who design, implement and use Geospatial technology solutions, AGI dedicates this Edition of its newsletter to the theme of Location-Based Services and the role of Geospatial technologies in their advancement.

We hope this Edition comes across as insightful and enjoyable. Stay tuned for more insights, stories, and analyses from AGI in the coming months.

Enjoy Reading,

Pramod Kaushik
President, AGI

In this Issue

Precise geo-data forms the foundation of digital infrastructure for urban and infrastructure development.

I strongly believe that anything you cannot measure, you cannot manage, notes **Sajid Malik, Chairman and Managing Director, Genesys International**

Genesys is pioneering a paradigm shift from traditional to next-generation mapping by expanding to the 3D virtual geographic environment and artificial intelligence. What benefits do you think such advancements could bring to the Indian economy?

India will be witnessing two major trends: the largest urbanization wave in the world moving ahead coupled with billions of dollars in infrastructure development.

Precise geo data forms the foundation of digital infrastructure for urban and infrastructure development. With advancements in technology - 3D and digital twins represent the most efficient way to plan, design and maintain infrastructure to help citizens and harness the best technology offers.

We have pioneered the usage of 3D in the country with our investments in LiDARand multiple sensors which we believe will come into increasing play post the new policy environment. Genesys' focus on 3D is not new but has been a specialization for many years now. We have also undertaken international projects for the same. Genesys has also filed for two patents in the fields of geocoding in 3D and AI/ML development.

You have recently partnered with Google for the launch of Google's Street View in India. Tell us more about this partnership and the anticipated impact of this offering in the country.

This partnership is a direct outcome of two things. Firstly, we have been the pioneers in street imaging in this country, having launched the same on our WoNoBo platform collaboration almost 10 years ago. Secondly, the new Guidelines and conducive policy environment have brought about an overall boost for the Geospatial landscape.

We believe that the Google Maps platform along with its massive relevance and user base will leverage the Street View offering for the benefit of thousands of small businesses. More and more MSMEs will now get to take advantage of a digital presence. Moreover, millions of Indians will benefit from improvements in last-mile connectivity due to Street View's comprehensive use cases.

Last year, Genesys International filed a patent involving the automatic extraction of street furniture from panoramic imagery and LiDARdata acquired from terrestrial mobile mapping systems. Considering the high vertical accuracy of LiDAR, what avenues could this technology open up in the future?

I strongly believe that anything you cannot measure, you cannot manage. LiDARis one technology that allows measuring features very accurately.

At Genesys, we are a pioneer in mobile mapping systems, though earlier, we used to do a lot of manual processing for identifying features
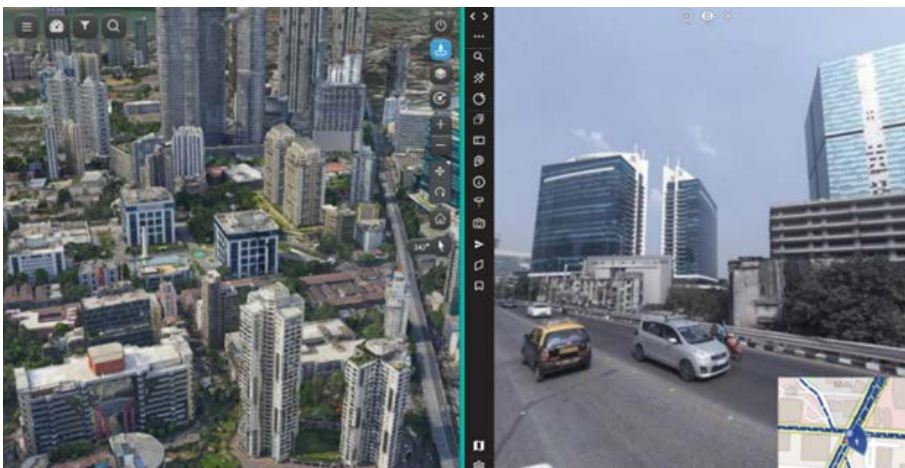
3D Digital GeoTwin technology by Genesys International; Source: Genesys International website

*AGI Members Google India, Genesys International, and Tech Mahindra have partnered for India Street View Feature
(L-R: Roli Agarwal, Sajid Malik, and CP Gurnani)*

and geo-tagging. Now we have switched to advanced ML algorithms. Genesys believes in developing innovation as a practice, and we are steadily moving toward introducing machine automation in Geospatial content generation and analytics.

Genesys has also recently launched a pan-India 3D Maps programme aimed at producing highly accurate 3D digital twins for 100 cities in the country. What are some of the use cases you are looking at from this development? What role can it play in revolutionizing location-based services in the country?

Honestly, there can be a plethora of use cases from our pan-India 3D maps program. The primary aim of content creation like this is to enable partner networks to develop applications for vertical domains. We have a rich partner ecosystem leveraging our content for various developments.

For instance, Bentley Systems is using engineering-grade LiDARcomputation for infra, road, etc. On the other hand, ESRI is using the data for the planning of different components, while Hexagon is integrating our content with data acquisition and processing to develop solutions.

In terms of location-based services, I can particularly cite one example. We are involved in the creation of 24 Airports in Saudi Arabia where location-based services are playing a huge role in airport navigation and management. This can be replicated in India too with tremendous success.

Lastly, what do you think the future holds for the new wave of analytics that Location-based

Services and Business Intelligence are bringing?

Whilst many new insights will emerge through analytics, we need to remember that none of this is possible if there is no good foundational data in the first place. This is what our company is building for our country. At Genesys, we are creating the biggest democracy of data in the biggest democracy of the world.

Mr. Amitabh Kant, CEO NITI Aayog, at the Announcement of Genesys' pan India 3D Maps Program
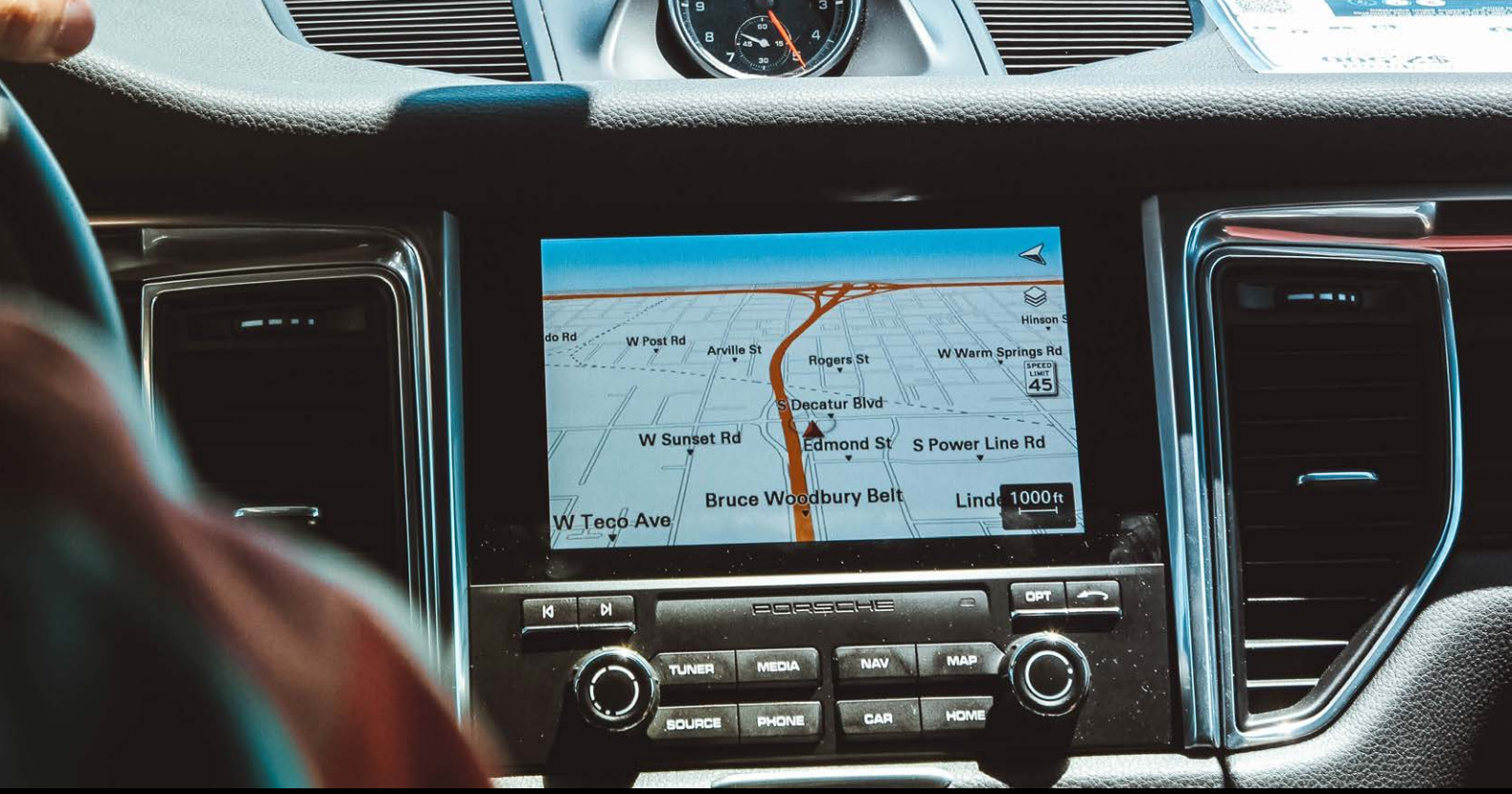
The Present and Future of Location-Based Services in the Indian Context

By Sakshi Singh

Location technology is impacting mainstream industries and experiences much more than we perceive. The need for and access to instant location information has become an urgent demand across industries and user bases.

From hunting for the right place to eat, to booking a ride to the airport in minutes, from letting friends and family know where you are, to navigating a sprawling campus without relying on strangers - more and more users are using real-time Geospatial data and optimized location-based services in their daily lives.

Considering the number and types of industries that can benefit from location-based services (LBS), it will be an understatement to say that there is tremendous scope for growth and advancement in the field. Governments and businesses in India are already leveraging LBS to revolutionize their interactions with the end user, and yet there's much more that can be done.

What are Location-Based Services?

Technically speaking, any service that uses geographic data and information to offer facilities or information to consumers can be called a Location-Based Service. Today, however, LBS is used more colloquially to refer to services based on data acquired from mobile phones, and strictly available through them.

GPS and WiFi data, cellular tower pings, QR codes, and RFID technologies are among the most common ways for location tracking for LBS. There can be many end outcomes of such LBS platforms - locating nearby points of interest, looking up travel-related information, indoor and outdoor navigation, and even social networking and entertainment. Additionally, they can be employed to deliver high-end services such as fraud prevention and emergency response and rescue.

"There is no clear-cut boundary of LBS and GIS; the boundary could be even more blurry in the future when conventional GIS advances to invisible GIS in which GIS functionalities are embedded in tiny sensors and microprocessors," notes Mr. Deepak Choksi, Chief Technical Officer, Bhugol GIS. "In the future, conventional GIS concepts may disappear, instead GIS functionalities may appear in a pervasive fashion. The critical requirements of last-mile connectivity, proximity marketing, and store locations can be effectively addressed by LBS using GIS tools like GRAM++, an indigenously developed GIS tool well poised to support the varied needs of LBS."

It would not be an exaggeration to say that LBS usage has become a significant part of the daily life of the common man. That's not all; the technology has also become popular with governmental organizations, multinational corporations, SMEs, and startups. Their popularity in India is particularly impressive.

How India Leverages Location-Based Services to Improve Citizen and Consumer Satisfaction

Ever since the Indian Government made the use of GPS mandatory in all smartphones starting January 2018, the LBS market saw an exponential boost. Today, government agencies like ISRO are undertaking multiple LBS-based projects across application areas, including Indian heritage tourism, traffic monitoring, and reporting, agricultural insurance, precision farming, and horticulture.

The **National Highway for Electric Vehicle by 2020 (NHEV)** has partnered with AGI member UNL for its TECH-Trail Run project that will allow electric vehicle fleets to run using an Anti-Theft System (ATS), powered by location technology. At the same time, drivers get access to a comprehensive location-based service that notifies them of points of interest such as EV charging stations, bus stop points, taxi pick-up, and drop-off points, road signages, accident-prone points, vehicle speed information, toll information, and emergency services.

The **Uttar Pradesh Police**, on the other hand, has partnered with AGI member Hexagon India to map various types of crime data for both citizen and departmental access. Nearest police officials are automatically detected during any incident, along with relaying the frequency at which they can reach the crime spot. All rungs of the police system, up to the DG level, can use a mobile application to access crime-related insights and analytics with a single click.

Several Indian businesses and startups are also leveraging LBS to transform the daily life of their customers. Logistics and supply chain venture **Delhivery** is using location-based services to help operate flexible, reliable, and resilient supply chains at low costs for small businesses in the country. They are offering express parcel transportation, PTL and TL freight, cross-border and supply chain services using LBS.

Online food ordering and delivery platform **Swiggy** is pioneering the era of Q(uick) Commerce in India using location-based services to maintain error-free, hassle-free, and time-bound deliveries. Swiggy has also introduced LBS-enabled offerings like cloud kitchens, instant grocery delivery, and pick-up and drop services of everyday items for users across the country.

There are many more startups of note rendering interesting location-based services across niches. HealthTech venture Visit is making healthcare more accessible for the masses using LBS. Hyper-local social networking app **Public.app** is being used by political leaders, media houses, citizen journalists, and local businesses to reach local consumers.

OLX India is using hyper-location targeting to reach second-hand automobile and mobile markets. Shared mobility platform **Revv** offers location-based car search on their website for customers, sending them city-specific notifications. TravelTech platform **Pathfndr**, earlier MeTripping, generates automated itineraries by leveraging route and weather data.

Apps like **ParkSmart**, offering location-based information and direction to the user's nearest parking spot, and **PinCarts**, connecting brands, retailers, and high-value shoppers for location-based shopping, are also leveraging advanced LBS use cases to drive user experiences.

The Future of Location-Based Services: A Lot to Explore

"Micro-location and hyperlocal data are going to be critical, as the future of location-based services and experiences is becoming hyperlocal, hyper-contextual, and hyper-connected. To date, there is still a huge lack of mapping data particularly for emerging and fast-developing economies like India where location data is dynamic and changes every day, every hour, and sometimes every minute," notes **Xander van der Heijden, Founder and CEO, UNL. "At UNL**, we give companies the tools to build hyperlocal solutions at varying scales and manage their own Virtual Private Maps and location data. Businesses can choose their own data providers at different geographic levels for an additional layer of flexibility, local context, and accuracy to location-based solutions like last-mile delivery and e-commerce."

Though already widely used, LBS should be viewed as an emerging technology that can usher in huge benefits beyond its traditional applications. Smart Cities can use LBS to collect relevant data for urban and infrastructure planning while automating and streamlining citizen experiences at reduced costs. LBS can be used to directly guarantee the safety and security of citizens and assets by combining with surveillance and emergency management platforms.

Location information can be added to health statistics to better define the area of interest and facilitate deeper analysis that results in the underlying cause's discovery. By combining location technology with various sensors, it is possible to follow an elderly individual's movements, and get a good sense of their physical condition for remote care.

By integrating with AI and IoT, LBS can ensure exceptional competitive advantage to businesses in multiple areas. Businesses can target potential customers in a particular geographic area using LBS to send them specific promotional offers and announcements, for instance, cab aggregators and food delivery platforms.

Retailers and quick-service restaurants can deliver tailored and highly relevant content to users to increase foot traffic. Businesses can also analyze and investigate data aggregated from LBS platforms, in conjunction with Big Data Analytics, to predict customer preferences and behavioural patterns. Companies employing remote workforces can use LBS to ensure that their workers are exactly where they are supposed to be. Location-based services can be deployed to match the customer's location to a credit card transaction for preventing and detecting fraud.

With time, we can anticipate further development, upgrades, and precision in both Geospatial and smartphone technologies, not to mention in AI, IoT, Data Analytics, and AR/VR. The combined impact of such technological prowess is sure to create room for many more cutting-edge applications of LBS across industries.
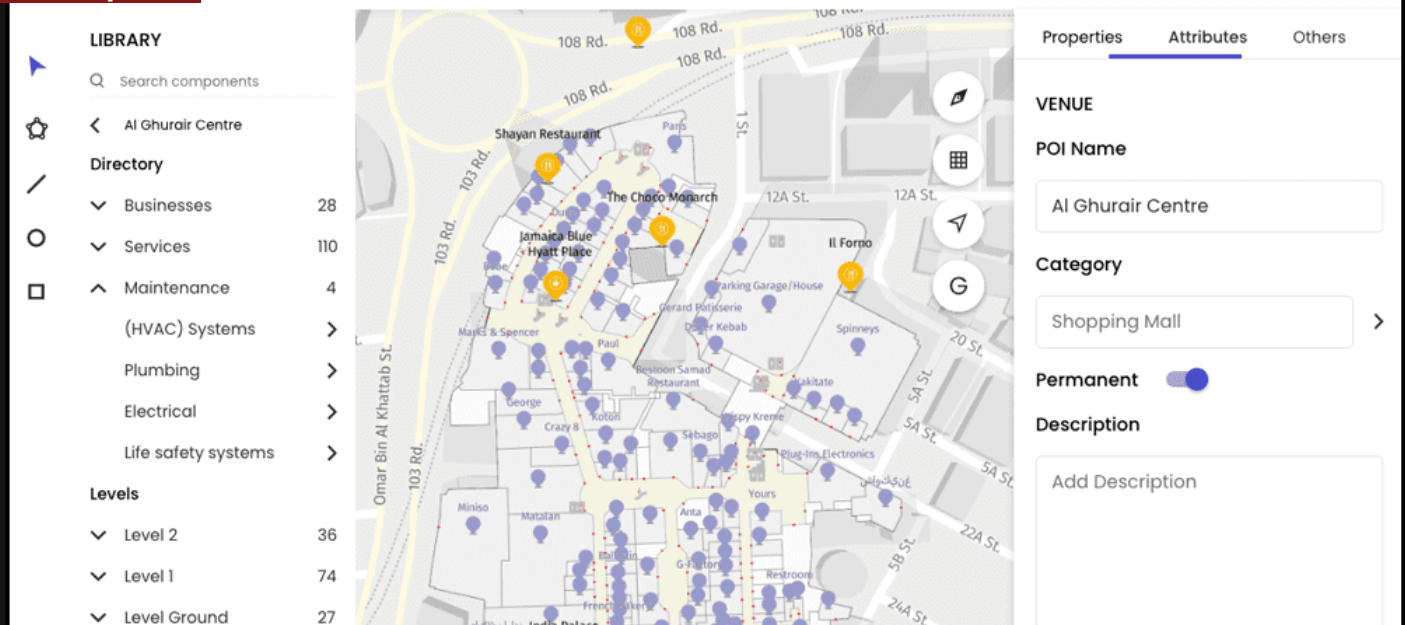
The Future of Maps is Hyperlocal, Hyper-connected and Hyper-contextual

Location-based services are taking over consumer lives and lifestyles. Ecommerce, last-mile delivery and mobility sectors are among the most prominent examples of how hyperlocal services are steadily becoming the norm, as demand over the past years has been increasing exponentially.

What is Hyperlocal?

Hyperlocal refers to information and services organized around a particular geolocation. In the context of eCommerce and last-mile delivery, hyperlocal refers to micro-local retailers and the delivery of products and services like groceries, home care, personal care, apparel, accessories, maintenance, food, etc. Quickly, seamlessly and to the customer's doorstep.

What are the Challenges that Hyperlocal Service Providers face?

From supply chains to transportation systems, every economy depends heavily on maps, addressing and routing to connect and bring people and goods from A to B. But the world is far from perfectly mapped. To date, mapping has largely focused on urban areas but there is still a huge lack of mapping data when it comes to rural areas, venues, and indoor spaces.

Accurate addresses are crucial for many services, including location searches, navigation, food and parcel deliveries and mobility solutions. Traditional mapping providers struggle to achieve more than 60-70% geocoding accuracy. This is a prominent challenge for

EVEN TODAY, 75% OF THE WORLD IS BADLY ADDRESSED, LEAVING 4 BILLION PEOPLE WITHOUT AN ADDRESS. WHERE THERE IS ADDRESSING INFRASTRUCTURE, 80% OF ADDRESSES IN DEVELOPING COUNTRIES REMAIN UNVERIFIED.

retailers, eCommerce companies and last-mile delivery providers, as we are talking about billions and billions in loss because of inaccurate addresses that result from the lack of last-mile information and data.

When the address is not accurate or is incomplete, either the deliveryman resorts to calling the customer to complete delivery or the delivery fails entirely. This costs eCommerce and delivery companies a lot of time and efficiency, which translates into a huge loss in revenue and profits.

How Big is the Problem of Inaccurate Addressing?

For centuries maps have been built from a one-map-fits-all mindset and as a global-first solution. Yet, maps still lack accuracy, context and in many regions content. Even today, 75% of the world is badly addressed, leaving 4 billion people without an address. Where there is addressing infrastructure, 80% of addresses in developing countries remain unverified.

When it comes to addresses, globally, there is a wide variance in addressing formats. In Indonesia for instance, addresses are often landmark-based and descriptive like "the store is across the yellow house." Addressing systems in India are complex and completely non-standardized, while administrative boundaries and names of localities/roads change regularly. This makes digital mapping and maintaining a reliable addressing database very challenging. Very often, residents use completely different road/locality

names from the official postal address. Moving from the first tier to second- and third-tier cities, the discrepancies become more and more prominent, increasing the challenges for retailers and last-mile providers to complete the order in time.

The Future of Maps is Hyperlocal and Hyper-contextual

The next evolution of maps moves the attention from well-known places to the unknown, unmapped, and more complex regions of the world. This, with a hyperlocal focus and capabilities to capture hyperlocal data and bind it to specific geolocations in a contextual manner.

At UNL, we think about locations differently and took a hyperlocal-first approach to solve some of the biggest challenges in the accuracy of mapping, addressing, and routing. Inspired by gaming principles, we created a next-generation mapping and micro-location technology and platform. We pixelized the world in a 3D smart grid to digitize physical locations and create an infrastructure to interact with them via unique, verifiable digital addresses – UNL geoIDs. On the ground, indoors or up in elevation, UNL geoIDs can address locations with a micro-precision of up to 1x1cm².

UNL geocells represent micro-databases that can store hyperlocal data and be enriched with context. Cells are in continuous communication with their neighbours without the need for human intervention, essentially forming a distributed database. Our distributed cell-based database allows us to establish the right semantics between cells and create space and time relationships between landmarks. All data updates are published on the map in real-time and embedded in UNL Semantic Search Engine and UNL Router.

The Future of Maps is Data Agnostic

Making maps is not the most difficult part. Keeping maps up to date is the real challenge. In emerging and fast-developing economies like India, location data is dynamic and changes every day, every hour and sometimes every minute. Aggregating big quantities of POI data is not sufficient, it is really about the quality of that data and the speed at which maps get updated.

Each market comes with its unique challenges when it comes to infrastructure, addressing systems and local standards. Achieving a hyperlocal level of accuracy and relevance of maps and location data can be too resource-, asset-, tech- and labour-heavy for a single mapping provider to guarantee. The only way to do that is to make maps distributed decentralized and hyperlocal. Establishing collaboration of all local stakeholders to contribute to these maps.

With UNL, we give companies the tools to create and manage their own Virtual Private Maps with just a click of a button and securely bring their own data and business knowledge. UNL Platform is designed to be data agnostic. This approach empowers enterprise users with a choice of data providers at different geographic levels and brings an additional layer of flexibility, local context, and accuracy to location-based solutions like last-mile delivery and eCommerce.

Data autonomy and ownership are core to UNL's philosophy and values since day 1. Any data our clients bring remains under their control and ownership and can manage data access rights.

The Future of Maps is Dynamic and Self-Healing

Due to the wide variety and ambiguity in addressing systems, a standard off-the-shelf geocoding solution is not sufficient to solve the last-mile accuracy

challenges in emerging markets. Geocoding needs to go hyperlocal and continuously learn and train itself as per the addressing standards and trends.

At UNL, we are building a "living geocoder" designed for continuous improvement, which can train itself with address and location data to derive higher coverage and accuracy on an ongoing basis. With our Virtual Private Map approach and close collaboration with the customer, we are creating a unique feedback loop mechanism to consistently improve geocoding accuracy across regions.

Accurate geocodes translate to fewer failed deliveries, fewer miles per delivery, less time needed to locate addresses, lower operational costs, and improved route optimization.

How can eCommerce and Last-Mile Companies tap into these Capabilities?

Via the UNL do-it-yourself Platform companies of various sizes of operation — SMEs and bigger businesses – can create their own Virtual Private Maps with just a click of a button and tap into the UNL suite of plug-and-play mapping, geocoding, search, routing and data management APIs, SDKs, and plug-ins.

UNL Platform supports any kind of integration scenario and companies can choose how to interact with our technology depending on their business context – build directly with or integrate with existing solutions via standardized APIs and SDKs; tap into the capabilities of our UNL Studio - which is a powerful visual private map editor; or get off-the-shelf applications (no coding to start) from the soon-to-launch UNL mAppStore.
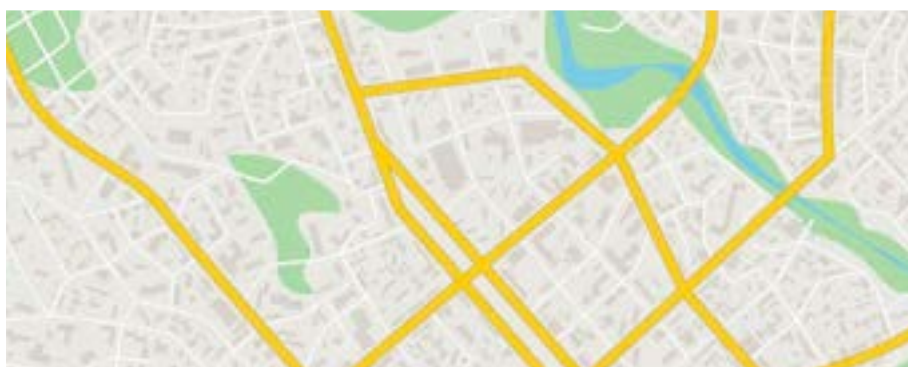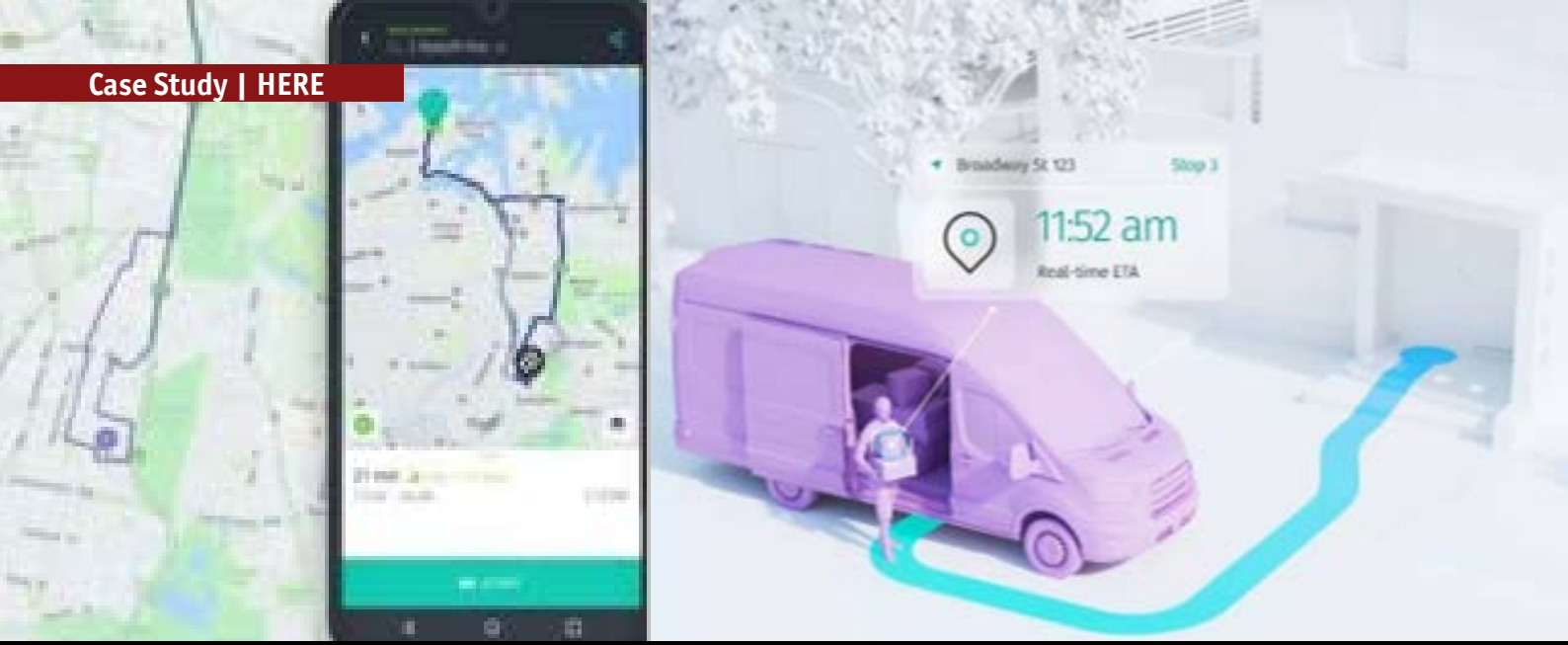
Enabling Logistics Digitalization for
Supply Chain Automation Company using Location-Based Services

The trucking and logistics industry has been long overdue for a technology overhaul. The industry demands efficiency, trust, transparency and real-time information. Different stakeholders have nuanced roles to play in the network, and these unique personas need innovative solutions that work for them.

TRANSO, an automation technology platform company for supply chain and logistics services providers reached out to HERE Technologies to co-develop a solution to reduce time spent guessing the estimated time of arrivals by monitoring the location and condition of shipments, reduce costs for logistics companies with real-time asset visibility and improve the planning process and event prediction to enhance stakeholder collaboration, risk mitigation, agility and project optimization.

HERE Location Services (HLS) helped TRANSO and end customers on delivering logistics efficiency, enabling more deliveries per vehicle which translates to a reduction in the cost of goods sold while reducing the carbon footprint, saving time, improving customer experiences, and ultimately creating more value.

Problem Statement

Long delivery times or uninformed arrival times can make a huge difference in customer satisfaction for logistics and supply chain companies. Last-mile delivery providers relied on manual inputs to drivers to orient them to the schedule of deliveries and leave the delivery routing to their best knowledge of the locations. Scheduling dispatches and providing an optimal trip sheet to drivers was one of the top challenges in the given case example.

> **THE INDUSTRY DEMANDS EFFICIENCY, TRUST, TRANSPARENCY AND REAL-TIME INFORMATION. DIFFERENT STAKEHOLDERS HAVE NUANCED ROLES TO PLAY IN THE NETWORK, AND THESE UNIQUE PERSONAS NEED INNOVATIVE SOLUTIONS THAT WORK FOR THEM.**

Solution

HERE's location-based solution offerings helped the logistics service provers to improve total delivery time and provide near real-time updates to end customers. HERE Routing and Navigation solutions helped to select routes for different modes of transportation, optimize route by using over 100 parameters, dynamically update ETAs and provide turn by turn guidance.

HERE Tour Planning solution helped to cost- or time-optimize tours for all vehicles in a fleet, incorporating vehicle type and capacity, to maximize utilization. HERE Last Mile solution Increased efficiency by using accurate geocoding and addressing for delivery locations. It defined job constraints, priorities and availability windows to help reduce idle time.

Key Outcomes

Combined with the new HERE Location Services based navigation experience to drivers, multiple end customers that include 3PL, 4PL, manufacturers, Distributors, Warehouses, Ports, Transporters, Fleet Operators that use the TRANSO application have increased the accuracy of ETAs by up to 25%, reduced fleet operating costs by up to 21%, increased stops per route by up to 30% to make fleets more productive.

Backed with HERE Location Services, the TRANSO application now has:

- Digital trip sheet on App with optimal drop sequence.
- Drop-wise map navigation to drivers, location address and receiver contact details.
- Arrival notifications with better location accuracy via HERE Maps.
- Auto trip end, manual trip end with OTP and PoD upload feature.
- Near real-time trip status updates to the users.
- Nearby points of interest data for refuelling and emergencies
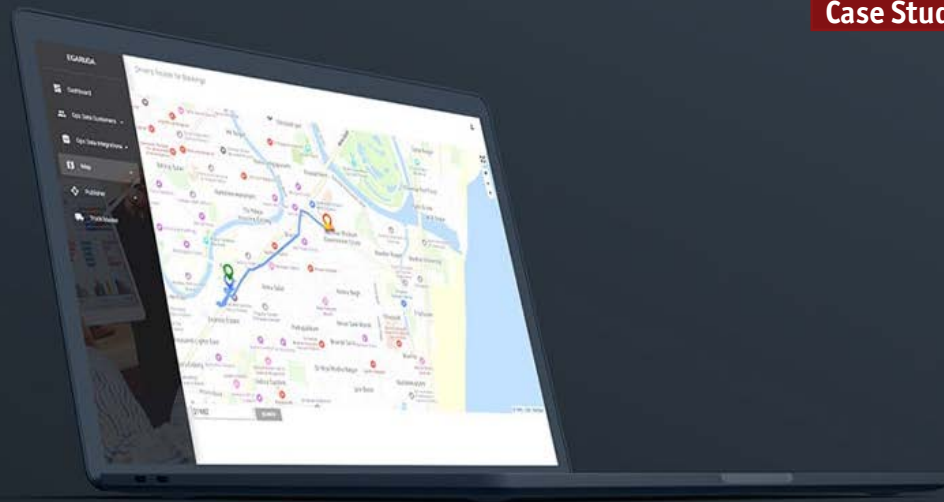
Maximizing Efficiency of Fleet Tracking and Delivery with Location-Based Services

Based in southern India, WowTruck is a logistics firm that tracks tens of thousands of vehicles. The company that delivers goods for the likes of Amazon, Unilever, Britannia, and Samsung, introduced an app to help maximize trailer loading and enhance fleet asset tracking. When deciding on a location data provider for its new app, WowTruck turned to TomTom.

Problem Statement

In the world of fleet management, there are two big jobs to accomplish. The first is to maximize the amount of time a fleet driver spends on the road with a fully loaded trailer. If a driver leaves the dock, drives 700 kilometres to make a delivery, off-loads their trailer, and then returns with an empty load, inefficiencies abound, as an empty truck is a waste of both fuel and time.

The second big job is maintaining the visibility of fleet assets. If fleets can't be monitored, drivers can take inefficient routes, spend too long idling at one location, or arrive at a depot unexpectedly, catching unloading crews unaware.

Solution

WowTruck has developed B2B and B2C solutions for the fleet management industry. In B2B, they've become known as a leader in connecting shippers (i.e., Amazon) to carriers (i.e.,

independent truck drivers), striving for a great delivery experience with maximum efficiency. They also maintain a call centre that supports the driver on their way.

In B2C, WowTruck implemented a convenient app that can be used to schedule and book a pickup. For example, an individual who's rented a new apartment wants to hire a truck to move their belongings to their new home. That individual can open the WowTruck app and enter their current and destination addresses and request a pickup.

On the backend, multiple trucks nearby can also be using the app. Each of those truck drivers sees the individual's request, and one driver accepts the job based on location and price. The app then shows the individual's location on a map. The driver is routed to the pickup point, loads the goods, and uses the WowTruck app to efficiently route to the destination.

The WowTruck app requires visibility into the location of fleet assets. To find the best location technology provider for its needs, WowTruck conducted several proof-of-concept studies on mobile and web interfaces using PHP and React JS. The company checked the accuracy of waypoints, the reverse geocoder and route efficiency. WowTruck compared various Maps APIs and found that the TomTom Routing API is more flexible and extensive in terms of parameters. This translates to superior fastest route calculations, making it more suitable for trucking applications.

Truck routing is very different from vehicle routing, where turning radius, vehicle dimension, weight, and cargo type (i.e., HAZMAT) must be considered. The TomTom Routing API is purpose-built for the specific challenges associated with routing large fleet vehicles, a true differentiator for fleet management software companies and fleet managers.

Key Outcomes

The WowTruck app uses TomTom location insights to improve driver safety, reduce CO2 emissions, and improve cost efficiency. It also aids drivers in maximizing kilometres driven with a full trailer load, while providing the back office with full fleet asset visibility.

Joseph Stervin, CTO at WowTruck said, "The TomTom price model helped us to realize a 68% reduction in our costs. We also really appreciate how TomTom gave us early access to their innovative beta products so that we could test them against our various use cases. Their pricing and flexibility are a true differentiator for us." Stervin added, "Their APIs are extensive, robust and easy to implement".

Using TomTom's technology, WowTruck has found ways to develop its business and overcome the two main challenges of logistics and excel at each. They are moving tens of thousands of vehicles throughout southern India and tracking them safely and efficiently every step of the way.

Location-Based Services Success Stories

Location-based Service (LBS) is a software service for mobile device applications that requires knowledge about where the mobile device is geographically located in real-time. The technology persistently identifies the user's physical and geographical location, which is then used to perform services and functions.

For location-based services to operate successfully, the following four basic components are required:

1. An application that uses LBS
2. A positioning mechanism to collect geo-data
3. A mobile network to transmit or receive data
4. An analytics software running on a remote server to compute and deliver relevant data to the user based on geographic location.

Location-based services are transforming into powerful applications across sectors like healthcare, logistics, manufacturing, real estate, marketing, transport, tourism, etc. What LBS applications so valuable is the ability to collect data and track the routes and times of people and goods.

For instance, advertising and marketing agencies find that using location data helps companies and organizations run more successful campaigns. Location marketing insights help companies get more leads and increase customer engagement and response. They also understand their customers better, enabling them to deliver need-based solutions.

Premier advertising agencies use LBS through web and desktop applications to plan, monitor, and manage proximity-based ad campaigns. Data picked up by field workers from mobile survey applications can be used to decide the best areas for placing advertisements. Geospatial data can also be leveraged to create spatial density maps that can be visualized using dashboards to predict and analyze best-suited locations for business expansion.

Listed below are few examples where Garudalytics has developed location-based GIS applications and derived brilliant outcomes using mobile location analytics.

Location-Based Services for Digital Advertising Campaigns

The era of location-focused marketing and advertising services using the latest technologies is also helping enhance the productivity and organization of online ad campaigns.

The collected real-time ground data can be easily plotted on maps irrespective of file format and extensions. Further analysis based on available geospatial functionalities such as marker clustering, heatmaps, 3D analysis, etc can help identify hotspots where the probability of ad campaign success could be the highest.

The location-based web GIS application so developed acts like an online monitoring system for managers and clients to achieve targeted advertisements and review ad campaigns based on location insights.

Location-Based Services for Real Estate Sector

Real estate is another major application domain where location-based services can be used. Property development planning can be based on a data-driven strategy using LBS for assessing a site in terms of value, market conditions, and surrounding context. Area-wise estimates of market rates can be pulled up based on historical data of the region. This provides entrepreneurs, dealers, and sellers the flexibility and convenience of on-demand data for strategic investments or sales.

Location-based services provide a multitude of interactive insights to customers for property research when purchasing residential or commercial real estate. For instance, a prospective buyer can analyze and identify the proximity of markets, hospitals, and other important amenities of a property, based on their need.

Garudalytics has developed an interactive dashboard for the transactions of real estate rentals and sales using location-based services. The dashboard helps people check details of area-wise property sales, rent, and mortgage transactions and derive quick insights on sales velocity, resale price trends, and rental activity in figures. The dashboard allows the user to choose micro-markets depending on their area, and enter specific time ranges, deal sizes, and rates to view transaction details on area-wise maps and figures.

In this light, our voice-based mapping product, the Garudalytics Smart Mapping (GSM) has the potential to cater to millions of users worldwide daily using location-based services across sectors. The GIS application uses a combination of location intelligence and artificial intelligence and is enabled to handle voice commands to perform multiple operations.

It can prove useful in analysing hotspots of road accidents, creating land use cover maps, and issuing route maps using only voice commands within seconds. GSM can directly publish location data to perform various analytical operations that can generate quick insights for effective decision-making and is set to take location-based services in India to the next level.
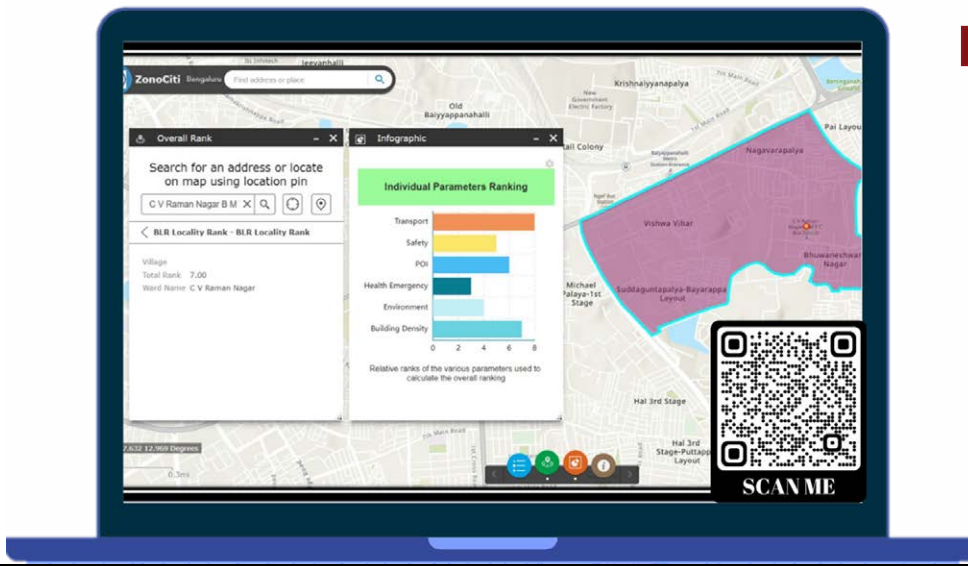
ZonoCiti: Facilitating Strategic Governance, Investments, and Grassroots Development

Regional assessments of liveability and development are commonly done at a citywide scale in countries. However, irrespective of the city's overall ranking, a finer look at its individual localities reveals that many are left unplanned, with lower liveability conditions and mismanaged utility and infrastructure systems at the ground level. For improved governance and well-integrated development in the Smart Cities of the future, we need to understand a city's actual requirements at the local level.

When it comes to property investments or moving to a new location, the data shared by consultants and developers about the immediate neighbourhood is usually insufficient. The location, surrounding context, and development patterns around the property or location of interest can give key insights on property investments, be it renting, leasing, or buying the property for use or expected returns.

Most real estate consultants give only partial information on the locality of concern due to their vested interest in the sale of the property, while other feedback could be based on biases or personal priorities. The need of the hour is readily available information to assess a locality on an intracity scale so that users get a basic idea of the immediate surrounding locality, which could vary every 3-5 km within the city limits.

The Solution: ZonoCiti

ZonoCiti can help bridge this information gap by providing a data-driven relative ranking of localities in a city. Localities are compared on various parameters using GIS-integrated information analyses. Different stakeholders may use these rankings in different ways, the crux being well-integrated planning and decision-making at a local scale.

ZonoCiti will be made available as a web application with access to information on a subscription/one-time use basis for individual users and as a shareable API for PropTech companies enabling easy integration of locality information with their property listings. The product will be fully developed and launched for multiple cities across the country by the end of the current financial year.

Working and Application

The application ranks the relative liveability for each neighbourhood zone in the city from 1 - 10 based on the presence and individual ranks of surrounding green cover, noise and AQI levels, safety, and accessibility to public transport, business centres, healthcare facilities, and general and recreational amenities.

The product offers the scope of adding many more parameters such as local property market trends and demography, infrastructure development trends, utility maintenance, etc., leveraging spatial data and GIS technology. Such insights can be quickly referred to when looking for areas within the city requiring rejuvenation activities or health infrastructures, etc. by city administrators; and even by real estate investors to assess the condition and the surrounding urban environment of the property of interest.

Key Benefits

- Quantitative monitoring of development across the city.
- Highlighting unacknowledged and unaddressed urbanisation issues.
- More uniformity and judicious use of resources in development planning.
- Ensuring accountability and coordination for achieving local governance objectives.
- Data-driven investment decisions and better returns on investments.
- Potential for enhanced community participation in a healthy competitive spirit.

Beneficiaries

- Proptech websites
- Intercity and interstate migrants and NRIs
- Urban Planners
- Government development authorities

Conclusion

ZonoCiti by Prakhoj was selected by the India Accelerator and ESRI India's GeoInnovation programmes and received superior mentorship, access to business operations tools, and software support to build the prototype. Prakhoj is also an ESRI Global startup partner with access to their platform and developer support for the project. Recently, ZonoCiti has also been selected for the AWS-MoHUA Innovation Pod 2022 in partnership with AGI, where Prakhoj will receive technical support from the Amazon Web Services team, along with a chance to conduct a pilot with city administrators once the official formalities are completed.

The availability of rich local-level insights using Geospatial technologies is going to be a game changer in the real estate and urban development industries. Prakhoj is open to partnering with various PropTech websites looking to integrate such information with their property listings to help their users make better decisions.

Contact Information

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Updates from AGI

REPORT ON INDIAN EXPERIENCE IN ALIGNMENT WITH THE UNITED NATIONS – INTEGRATED GEOSPATIAL INFORMATION FRAMEWORK

The Report on the "Indian Experience in Alignment with United Nations - Integrated Geospatial Information Framework" was unveiled by Hon'ble Minister Dr. Jitendra Singh, Minister of Science and Technology, Earth Sciences and Space, Govt of India during the official opening ceremony of the 2nd UN-WGIC.

It gives a glimpse of the kind of work, innovation, and benchmarks that Indian public and private sector organizations are establishing using Geospatial information, and how well they are aligned with various UN-GGIM Integrated Geospatial Information Framework (IGIF) pathways at the experience level. The Report also features several examples to substantiate the vast potential that Geospatial information has to offer in the country.

The AGI Secretariat was instrumental in the making of the report, having mobilized case studies from the Indian Geospatial industry and mapping case studies with the Nine Strategic Pathways of the UN-IGIF, along with writing, editing, and reviewing the entire report.

To download and read the full report, CLICK HERE

AGI MoU WITH SPA DELHI FOR GEOSPATIAL CAPACITY DEVELOPMENT

India's premier educational institute for the built environment – the School of Planning and Architecture Delhi (SPA-D), and the country's Geospatial Industry body – the Association of Geospatial Industries (AGI), signed a Memorandum of Understanding for Geospatial Capacity Development on Friday, November 18, 2022.

Under this MoU, SPA-D and AGI with its countrywide member ecosystem, will work towards bridging the gap between current learning outcomes and industry requirements concerning Geospatial technologies. Addressing the need for skill-based, industry-ready training for students and professionals, the MoU aims at inculcating a tech-forward mindset, improving employability, and increasing the availability of trained manpower for industrial and social development.