

VEHICLE TRACKING

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LT COL V S VELAN,
FOUNDER

ELENA GEO SYSTEMS

BUILDING INTELLIGENT

VEHICLE
TRACKING
SYSTEMS

USING

NavIC
MODULE

IN MY OPINION

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COVER
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BY JANIFHA EVANGELINE

The Global Navigation Satellite System (GNSS) is a constellation of satellites providing signals from space that transmit positioning and timing data to GNSS receivers, where receivers use this data to determine the location. One of the GNSS systems owned by the U.S. government and operated by the United States Air Force (USAF) is the Global Positioning System (GPS). The GPS is one of the several space-based radio navigation systems, which provides critical capabilities to military, civil, and commercial users across the globe. Since the day of its invention until today, GPS has been freely available to companies, countries, and any individual with a GPS receiver. Owing to one of the numerous advantages that GPS offers, the airlines, trucking companies, shipping companies, and vehicle owners use GPS systems to accurately track and monitor the navigation route and location of flights, trucks, vessels, and cars in the shortest time possible. However, there are a few technological challenges associated with the use of GPS. Therefore, most of the developed countries across the globe are exploring, testing, and deploying satellites to build their positioning capabilities.

Realizing its potential and to gain self-sufficiency in this domain, India has been launching satellites from 2008. It initially launched the Geo Aided GPS Augmented Navigation (GAGAN) system to help the civil aviation sector along with the up-gradation of airports. The results of this initiative in the civil aviation sector are very visible. This was followed by the launch of satellites for the Indian Regional Navigation Satellite System (IRNSS) commencing from 2013. Both of these are integrated to provide Navigation with Indian Constellation (NavIC or Navic) since June 2019. This regional geo-positioning system has been designed in India by ISRO to provide accurate positioning in India and the Indian Ocean Region.

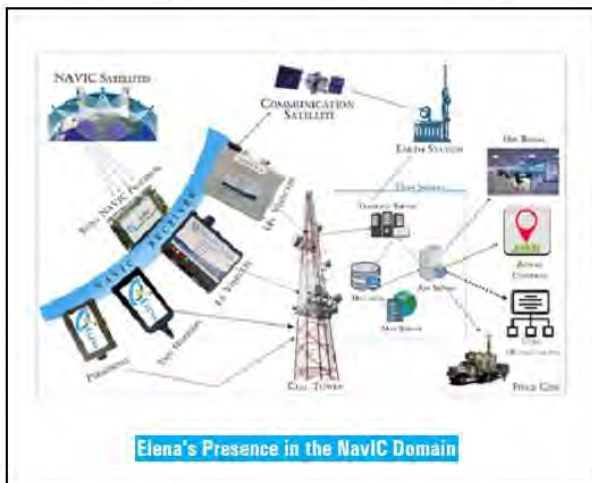
One such company that has an advantage in this sector with commercially available full NavIC processor systems is Bangalore based Elena Geo Systems. Currently, Elena is the only Indian company to operate in this domain, offering NavIC L5 and S-Band signals-based hardware. Elena has developed GNSS based monitoring solutions for the Asian region through its research and development.



The company's NavIC modules are quad-band and facilitate in bringing the full capability of the NavIC system to the user. As it is very compact it can be easily integrated into any equipment, and a range of circuits around the core processor to enable its easy adoption into any solution. Not just that, its low power requirement makes it suitable for handheld devices.

HARNESSING THE POWER OF GNSS

Elena GeoSystems was established in 2012 with a vision to develop monitoring solutions using NavIC, GPS, and GAGAN by Lt Col V S Velan, an Indian army veteran. The company has been specializing only in the niche segment which involves the creation of an entire downstream ecosystem from the Multi GNSS processor to a complicated intelligent system that could harness the full power of GNSS for use by the armed forces, paramilitary forces, police organizations, and the country.



“Elena and NavIC are interrelated just as how democratic government is created for the people, by the people, and of the people,” says Lt Col V S Velan, Founder, Elena Geo Systems. Elena was established for NavIC, by a NavIC officer and consists of NavIC professionals. “We work only in this niche segment unlike other electronics or IT companies that have migrated into this domain,” adds Velan.

ELENA'S NavIC MODULE

Through indigenous research and development, Elena now has the best-suited GNSS solution for India, and the Elena NavIC module being the core of it. This module is a low-cost, Multi-GNSS (IRNSS, GPS, GLONASS, GAGAN), Multi-band (S, L5, L2, L1) receiver which can be integrated into any circuit through the interface board, specially created for OEMs. What makes it



future-proof with very low life-cycle costs is the modular design, firmware upgrade, L2 band, and S-band features. The NavIC module uses algorithms created by ISRO specifically for use over the Indian region.

BEST-SUITED GNSS SOLUTION FOR INDIA

GNSS solution for India needs to be made for India through indigenous research and each component needs to be optimised carefully. Perfectly understanding these needs, Elena has created an end to end solution with all components optimised for India and around NavIC. The entire solution can be installed in standalone mode to work inside a corporate IT solution. Moreover, these have been designed and developed by Elena, each of the component of the solution can be installed independently after customization or as an integrated chain.

EASY TO INSTALL INTELLIGENT VEHICLE TRACKING SYSTEM

Over the past decade, the vehicle tracking system has been proven to be a boon to the Vehicle Industry as it offers a plethora of advantages such as providing real-time updates, preventing theft, reduction in insurance cost, and weather updates for paramount customer satisfaction.

Elena offers a unique Indian monitoring system conforming to Indian standards called IVTS (Intelligent Vehicle Tracking System), which uses NavIC, Indian GPS satellites. The system is specifically made for security

forces and data is being stored locally within India. This easy to install system is waterproof and includes a compact tracking device. It enables users to have better control of their vehicles by helping them monitor numerous vehicles from one place. IVTS not only possesses features such as correct routing and theft detection but it also provides benefits such as saving fuel cost and controlling speed limits of the vehicles.

BEYOND TRACKING REPORTS

The expectations of organizations vary greatly when it comes to Vehicle Tracking System. While some need only hardware for obtaining the Fitness Certificate (FC) from their Regional Transport Office (RTO), others need a daily report mechanism that is integrated into their ERP solutions.

Elena's system goes beyond providing normal tracking reports. This system can track personal vehicles, men, and other equipment in a common platform, which provides a comprehensive view to the manager about the state of things in an area. Elena provides reports that are analyzed by the system that contribute to better fleet management, which helps in reducing loss and increase efficiency. For one of its clients, the company had reduced the cost of operation by up to 80 percent in a single implementation.



ELENA NOW HAS THE BEST-SUITED GNSS SOLUTION FOR INDIA, AND THE ELENA NavIC MODULE BEING THE CORE OF IT

While other solution providers use components from various other vendors and integrate these components to provide a complete solution, the error in one system is carried forward to the other, resulting in numerous errors in the end product. Also, these solution providers generally use Google maps which makes the system heavy and unwieldy, making it unusable in case the connection to the Google server is lost. Furthermore, the data bandwidth is very high, when it comes to using Google servers.

Therefore, catering to solve the aforementioned issues, Elena has come up with this unique solution by conducting the dedicated long-term research that it initiated from 2012 until its launch in April 2019. One of the most astonishing facts about this system is it can be

used over areas that are not mapped by Google or other systems. Moreover, it can import the maps held with the corporate survey teams to enhance the perception.

ACCURATE LOCATION DATA USING INTELLIGENT ASSET TRACKING DEVICE

Elena also offers a very versatile tracking device that can be used for tracking of very varied types of assets by the corporates. The range includes railway, wagons, heavy commercial vehicles, containers, etc. This Intelligent Asset Tracking Device (IATD) has an in-built intelligence that can be configured for working in various environments. Elena's IATD uses the Elena NavIC module which is a multi-GNSS, Quad-band receiver which works in L and S bands. It is specifically made for NavIC – the Indian GPS to give assured, accurate, reliable location data with high integrity. It makes special use of algorithms provided by ISRO for calculating location data. The IATD can be configured to work in any part of the world using the best navigational satellites of that region, which gives MNCs a single common device for employability around the world.

WIDE RANGE OF HIGH-QUALITY SOLUTIONS

Elena offers a wide variety of products and solutions such as special Antenna, NavIC Processor, Electronic Monitoring Devices, Tracking Server, Geo-App Server, Map-Server, Android App, and Monitoring System. What makes Elena stand out from the other players in this segment is that every equipment from Elena can be installed quickly and independently. Thereby, this end-to-end presence has given Elena a very distinct advantage. Moreover, the company offers a high-quality solution since every component is optimized in the chain.

FIRST-TIME RIGHT APPROACH

Elena's dedicated team of professionals understands the importance of the technology for India and is ready to go the extra mile to deliver equipment that would make India self-sufficient. The company's advisors are from the defense, and from universities that are involved in core research in this area. Their combined inputs ensure the creation of the right solution the first time, which helps in reducing the overall time and cost of development.

"Currently, we are working on providing our third generation full NavIC enabled modules called the B2D module which is specifically made for the Indian Defence Forces. We are working with security establishments to supply our monitoring solutions and with three other defense manufacturing units to supply B2D based NavIC equipment, which will be integrated into their products," concludes Velan. CR