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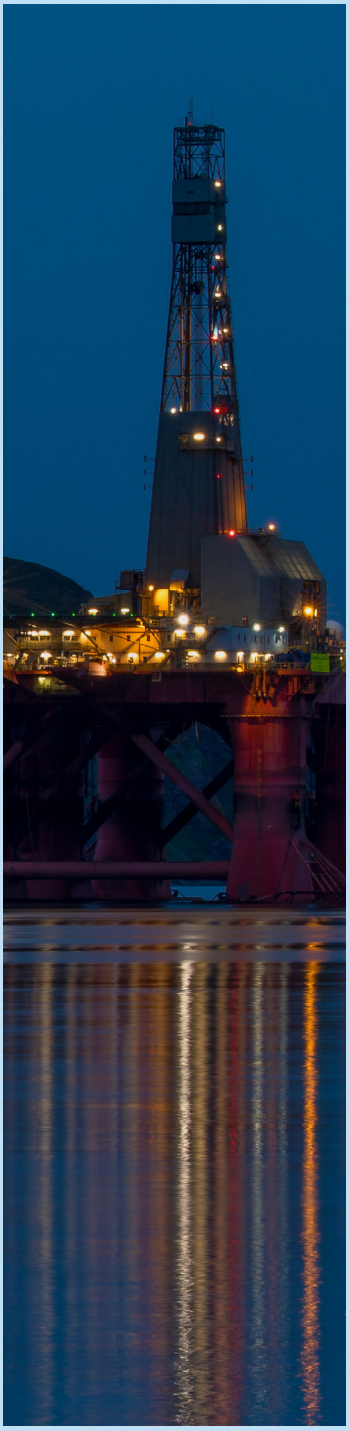

SAFETY AND ANALYTICS CAPABILITIES OF INDOOR MAPPING IN OIL, GAS, AND MINING SECTORS

Abstract

The divide between the physical and digital world in the oil & gas sector is getting smaller every day. Location-based information has always played an important role in the oil, gas, and mining industry for years. But this is just a drop in the ocean in terms of its potential role in the industry going forward. Nearly every aspect of operations and initiatives in the above-mentioned sectors will be impacted by the kind of insights now possible from location data.

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Why indoor mapping?

Indoor mapping is a cutting-edge tool revolutionizing the way the oil, gas, and mining industry operates. It provides real-time information on the location of personnel and equipment, enabling companies to optimize their operations and improve safety.

No longer will you have to struggle to find a coffee shop at the railway station before rushing to catch your train; nor you will not be embarrassed to ask for the toilet location when you are at the bus stop. There won't be any need to struggle during an emergency evacuation. Indoor mapping places all the solutions to these in the palm of your hand.

How indoor mapping helps businesses?

Indoor mapping is a rapidly developing emerging technology. Experts estimate that the global market is worth up to $10 billion USD. Future smart location-based services, through indoor mapping and smart customer services, will be the gateway to increased productivity, social inclusion, and safety.

MarketsandMarkets published a study on this. Based on that study, the market size of global location analytics across various industries was $18 billion in 2022. It's projected to grow to $33.2 billion by the year 2027. Growth in the adoption of IoT and increased availability of location data are fueling this growth.

Real-time location intelligence helps companies identify potential safety risks and optimize operations by providing real-time visibility into personnel and equipment locations. Additionally, location intelligence can be deployed to track the movement of materials and equipment, reducing the risk of theft and ensuring their efficient use.

Enhanced data & analytics capabilities in indoor mapping

With the help of a geospatial system for creating, managing, analyzing, and mapping indoor data, indoor mapping will enable shared awareness of your facility operations and increases engagement and efficiency.

Indoor mapping technology delivers a complete geospatial picture of all building assets and spaces, providing insights into how you use the physical space you occupy. It also provides visibility and analytics into asset locations and patterns of use to understand spaces and find smarter ways to interact with man-made structures. This enables make confident and well-informed decisions to be made regarding operations and overhead costs.

Indoor mapping enhances safety

Public and private safety is a market segment worth investigating. There is a need for operators to be present in high-risk areas, including underground locations, where high-pressure gas gauges, oil tanks, and pipes are installed. In such cases, access control and monitoring are critical for worker safety.

Indoor localization and mapping technologies are used to detect the presence of unauthorized persons in critical areas, indicating the need for assistance or rescue. Indoor wayfinding provides the ability to employees, safety personnel, and service technicians to route themselves to a precise point of interest inside a refinery or a mine, using an indoor map with asset locations. This allows staff to be directed to areas that require attention without wasting time and resources, as is often the case, with outdated or incomplete paper maps or flat CAD files. So, indoor wayfinding enables people to quickly identify, locate, and resolve problems.

In addition, the technology can be used to ensure that workers do not enter hazardous areas accidentally. For example, some facilities have restricted areas where only authorized personnel are allowed to enter. Location Intelligence can be used to track the movement of personnel and send alerts when someone enters a restricted area.

Location intelligence can be invaluable in other ways too

Apart from improved safety, some other benefits of location analytics and digital wayfinding in the oil, gas and mining industry include:

Better productivity: Digital wayfinding technology can help workers navigate complex and large facilities with ease, saving time and minimizing disruptions. Moreover, location analytics can optimize the flow of personnel and equipment, reducing bottlenecks and improving productivity.

Efficient asset management: Location intelligence technology can provide a detailed overview of equipment and asset locations, enabling companies to track utilization rates and identify underutilized resources. This information can help companies optimize asset usage, reduce maintenance costs, and improve overall efficiency.

Navigation and Wayfinding: It can be also used to create digital maps of a facility, making it easier for workers to navigate and find their way around. Location intelligence also helps provide directions to specific locations or assets within the facility.

Improved decision-making: Location analytics and digital wayfinding can provide real-time data on personnel and equipment locations, helping companies make informed and timely decisions. For example, by identifying congestion or equipment breakdowns, companies can quickly adjust to ensure smooth operations.

Important technologies used in location intelligence

The technology involved in location intelligence and digital wayfinding includes a variety of sensors and other devices. For example, sensors paired with data analytics can help mines avoid downtime, track wastewater levels, and even track vehicles and the material they are carrying, on their way to ports. Some of these technologies include:

Wi-Fi-based: This technology uses Wi-Fi signals to determine the location of a device or object. Wi-Fi access points are installed throughout the facility, and the signal strength and timing of the signal are used to triangulate the location of the device or object.

Bluetooth-based: This technology works in a way that is similar to Wi-Fi-based wayfinding but uses Bluetooth signals instead of Wi-Fi signals. Bluetooth beacons are placed throughout the facility, and the signal strength and timing of the signal are used to determine the location of a device or object.

RFID-based location intelligence: This technology uses radio-frequency identification (RFID) tags to track the movement of objects. RFID tags are placed on equipment or assets, and RFID readers installed throughout the facility can detect the tags and track the movement of the objects in real time.

Ultrasonic waves: This technology uses ultrasonic waves to determine the location of a device or object. Ultrasonic beacons are placed throughout the facility, and the time delay between the emission of the signal and its reflection off a surface is used to calculate the location of the device or object.

Conclusion

Indoor mapping technology is transforming the oil, gas, and mining industry by improving safety, optimizing operations, and enhancing efficiency. Through seamless integration of location technologies like sensors, data analytics and existing computer systems, it is helping companies unlock new sources of energy and maximize value from their assets while ensuring safety of their personnel.

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About Infosys BPM GIS Services

In order to address the mapping needs and real-time monitoring in almost all business functions, geospatial location platform is the key to manage public utility assets.

Our GIS team is made up of experienced domain experts with spatial technological background to manage customer asset value chain, including mapping activities, data creation and migration, application development, enterprise GIS upgrade/ migration, modeling, and analytics. We have a proven GIS Centre of Excellence, delivering professional services to maintain large GIS systems and data sets, helping our clients reduce their cost of operations by 40% and improve data quality with 99% accuracy in asset operations.

* For organizations on the digital transformation journey, agility is key in responding to a rapidly changing technology and business landscape. Now more than ever, it is crucial to deliver and exceed on organizational expectations with a robust digital mindset backed by innovation. Enabling businesses to sense, learn, respond, and evolve like a living organism, will be imperative for business excellence going forward. A comprehensive, yet modular suite of services is doing exactly that. Equipping **organizations with intuitive decision**-making automatically at scale, actionable insights based on real-time solutions, anytime/ anywhere experience, and in-depth data visibility across functions leading to hyper-productivity, Live Enterprise is building connected organizations that are innovating collaboratively for the future.

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