CSIR C³

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A CSIR-developed asset and fleet management system, first developed for use in military contexts, such as above, provides a holistic view of fleet and assets. Airports, manufacturing plants, power plants and research labs are adopting these technologies for smoother, safer and more secure operations.

IF IT'S VALUABLE, PROTECT IT: 24/7 ASSET AND FLEET MONITORING

A web-based system with real-time information on asset and fleet location and condition

Addressing a problem and fulfilling a market demand

The challenging business of tracking and monitoring asset health

Fleet owners and distribution agents face a myriad of challenges. These include crimes such as cargo theft and hijackings; vehicle misuse; and high costs of fuel, insurance and maintenance, including mechanical failures and power outages affecting traffic flow.

The CSIR has developed a web-based integrative tool that is used as a virtual 'operational command centre' to provide information regarding personnel and vehicles for better management of assets, costs and delivery of services timeously and efficiently.

The tool includes a 24/7/365 live tracking and monitoring capability of fleet diagnostics, health and status. This means one can assess the readiness of an asset for deployment in terms of its availability, service history and frequency of use and wear.

The system architecture has extensibility capability to provide several situational awareness use cases beyond asset and fleet management, for example in border control and disaster support deployments.

One integrated, real-time view of multiple operations

The CSIR-developed asset and fleet management system is a decision support tool that enables effective and efficient management of operational assets and the safety of operators – around the clock.

The system architecture is multi-layered and can be customised for different use cases, such as vehicle tracking, military deployments, border control and disaster response management.

Asset information kept up to date and secure

The vehicle tracking industry has grown quite significantly over the years. However, vehicle movement data are shared across reaction teams and kept in data centres where it is vulnerable to cyber attacks.

Uniquely, the CSIR-developed solution offers users control over their data, which is only visible to those who require real-time access – and to no other third party. This eliminates eavesdropping for mission-critical deployments in military and security operations.

Also, while competing products may offer some similar capabilities, the CSIR system has unique features that employ artificial intelligence to provide extra safety features, such as driver behaviour monitoring which helps accident avoidance by alerts sent to the command node.

The system's asset management option enables the management of complex warehouses, proving the location of essential equipment as well as their useful status. Mission planners thus have exact information on the location and status of critical equipment.

The system, which includes security access control and business reporting on asset utilisation, also provides ease of integration into an organisation's existing workflow and business processes through a novel gateway.

The system provides free draw geo-fencing by customers, allowing users to dynamically select areas of interest, such as exclusion and inclusion zones for their vehicles and assets. Most products on the market have predefined geo-fences particularly defined around crime hot spots, national borders and specific road terrains.

Intelligent systems to better manage assets and operations

The use of command and control systems has long since expanded to sectors beyond defence. Asset tracking of high-value assets has benefited from self-reporting internet of things GPS modules that require low power and have a long battery life. Yet, the major players in the development and deployment of command-and-control systems remain multinationals that have a strong link to their domestic military industry.

Licensing the full solution or software-as-a-service

The CSIR-developed operational control centre asset and fleet management system is available for licensing through CSIR C^3. This will entail a value-based client deployment of the solution as well as technology transfer revenue. A technically trained small, medium and micro enterprise (SMME) will undertake the routine maintenance of the solution once deployed, while the enhancement and maintenance will remain the prerogative of the CSIR.

The solution is also available as a software-as-a-service. In this scenario, the CSIR will host the system on behalf of entities that don't wish to invest in the required infrastructure but need control of the data.

The device installation (tracking units/GPS modules) will be subcontracted to a vetted SMME, while system configuration will be undertaken by the CSIR or its supporting SMME.

Becoming a licensee or appointed entity to deliver the service to clients

Investment in the order of R30 million is required to produce a baseline scaleable and extensible asset and fleet management system. The current version has been successfully piloted in the defence space and revealed areas of improvement to address customisation needs.

The development effort is expected to span over two years and entails growing the service offering's functionalities, enhancing the machine learning analytics and refining various internet of things technologies and protocols. Third-party communication is determined by data and bandwidth costs as provided by mobile telecommunication companies.

Milestones and timeline

The minimum viable product requires additions or customised services for it to have an enhanced impact on the user community. Further experimentation with the user community is planned. These developments will take place in year one and will be followed by industrial-scale testing in year two and full-scale industrialisation and commercialisation in year three.

Experts in systems and software engineering

The team behind this technology includes experts in systems engineering and integration, and software engineering honed on integrative command and security systems.

ENQUIRIES:
>> Innocent Siziba
isiziba@csir.co.za