Remote monitoring of multi-terminal sites is increasingly important to operators.
Terminal automation systems have reached a new level of importance globally, as industry recognises the strategic role that terminals play vis-a-vis business efficiency and profitability, regulatory compliance and tempering market volatility. The result? Market growth of 7.1% per year until 2026, according to Future Market Insights.1 Operators are seeking integrated, centralised terminal management solutions that can scale to control multiple sites. The Industrial Internet of Things (IIoT), Cloud, mobility, safety, cyber security and analytics are key considerations for these buyers. Operators also want a system that has been optimised for the supply chain and is flexible enough to perform functions as diverse as remote diagnostics, capacity management, data analytics, persona-based information management and visual dashboards, mobility, back-up and restoration.

Sridhar Sankaranarayanan, Honeywell Process Solutions, USA, explains how a new era of terminal automation is contributing towards business success.
and IT capacity. In short, the expectations for terminal automation solutions have never been higher.

Trends driving growth
There are various reasons behind the market growth. Demand is rising from third-party terminal owners who are selling their capacity to oil and gas suppliers. These suppliers are attracted by the access to innovation and business agility that a third-party arrangement can offer. This outsourced model is relatively new but is rapidly catching on, and it is ushering in new thinking about how terminal automation systems can drive increased profit.

There is also increased interest from operators of multiple terminal sites. Whereas in the past, many companies took a fragmented, site-by-site approach to management, today they are looking at their terminal networks holistically. The more centralised and integrated the solution, the better the efficiencies.

Globally, the wave of investment in terminal infrastructure and automation systems is coming from geographies with a high demand for energy, such as Eastern Europe, China, India and Latin America. Meanwhile, in North America, there is interest from shale oil and gas producers that are trying to keep pace with demand.

Today’s reality
When looking at the solutions many oil and gas companies are using today, it is unsurprising that a new approach to terminal management is required. Outdated, inefficient – and routinely – manual procedures are frequently used to control terminal operations in accordance with the ebb and flow of production demands.

The organic evolution of many terminal networks has also meant that the IT infrastructure of one site is often different to the next, creating complexity and inefficiency and preventing a flow of vital information to operators and decision makers. This fragmentation has prevented many companies from exploiting powerful data analytics that would otherwise transform their businesses.

Oil and gas companies need to break down silos and fully integrate and automate their terminal networks, as well as acquire the ability to exploit unified data from which insights can be drawn to make smart, real time operating decisions.

Cloud technology is one solution to these problems. Moving terminal automation to the Cloud keeps all that is good about existing technologies and addresses the limitations in areas such as operational security, scalability, availability and serviceability.

Current challenges
Some of the common challenges faced by terminal operators today include the following:

Disparate systems
Most oil and gas companies have, over time, procured different technologies for different terminal sites. This often results in terminals having unique system architecture, software, hardware, workflows, operational and maintenance procedures, alarms and reporting mechanisms. The disparity between sites creates a wide range of issues, such as high maintenance and scalability costs, significant CAPEX investment for routine extensions such as bays and gantries, siloed terminal islands, inefficient communication between terminals, and the inability to apply best practices from one terminal to the next.

Data collection and integration
With so many technical differences between terminals, it is difficult to rationalise the information that is collected from them, and to also create a common framework for data capture. This has resulted in an industry inability to assess and benchmark terminal performance via key performance indicators (KPIs) – for example, looking at why certain terminals perform better than others. KPIs are vital because they measure a terminal’s ability to deliver against operational objectives such as safety, efficiency, inventory and asset utilisation.

Data, analytics and visualisation
The lack of integration between terminal sites makes it difficult to analyse and visualise collective data – in the form of a dashboard, for example – to make informed business decisions. This also makes it harder to identify problems and bottlenecks, predict issues and pinpoint inefficiencies within the supply chain.

IT hardware
Terminal networks create vast IT demands, which are often compounded by the need to maintain various IT infrastructures. Some sites use different servers, operating stations, networks and PCs that require regular software and security updates, patches and dedicated IT engineers to keep them running. This disparity leads to IT maintenance and headcount costs that increase year-after-year, with higher chances of downtime or delays due to IT failures, and a lack of standardisation across terminal networks.
Mobility
Many terminal management systems do not support the mobile tools and applications increasingly used by site workers, which inhibits flexibility and restricts a key source of information for analytical decision making. For example, planning for a rail wagon requires significant manual work that could be simplified by using an application for certified hand-held devices. Using this approach, the owner of multiple terminals can have a clear view of inventories and the performance of loading assets, and decide what action to take, if any.

Safety and security
The level of protection provided by many systems has not kept pace with evolving threats. Maintaining high levels of safety and security for inventory, personnel and the site is the primary concern of any liquid, bulk or distribution terminal. The rise in global cyber attacks has increased the risks to industrial infrastructure and heightened the focus on security.

It is important that terminal automation systems integrate robust cyber security defenses with measures such as emergency shutdown, grounding of carriers, arm placement and overspill protection, to achieve the highest possible levels of safety. Measures on regulating entry, exit, and loading bay access – e.g. with proximity cards, radio frequency identification (RFID), biometric and personal identification number (PIN) systems – are also key considerations.

Terminal automation solutions: key considerations
Many of these operational challenges can be resolved by migrating terminal automation to the Cloud. The Cloud makes it possible to scale up or down in a way that was never possible before. For example, a plant owner can add terminals without having to go through a process of testing new software first at a factory, then at the plant. Plant owners can also easily add gantries and bays to increase the throughput of a terminal.

Key considerations for those considering terminal automation include:

- Equip terminals for the future. With the ever-changing price of oil, the system that runs a terminal must be flexible enough to adapt to new requirements. Open, flexible systems allow terminal managers to implement workflow processes that best suit their situations at different points in time. Managers do not want to be stuck with a system that is technologically obsolete or one that is not flexible enough to accommodate change, which in turn could result in significant operational expenditure.
- Be aware of the bottlenecks that could inhibit terminal efficiency. There could be various reasons why a terminal is not performing as efficiently as it should. Identifying a system that can collect different types of data and presenting it in a holistic manner that makes decision-making easy can ensure the system keeps learning as new data gets added.
- Ensure a system is fully protected against any cyber threats. Security is a concern whether using Cloud-based solutions or not, and potential users need cutting-edge safeguards to protect their data and wider infrastructure. It is imperative to seek a solution that integrates a complete range of safety measures, from enterprise software to video-based perimeter security.
- Always ensure the system in place can deliver the data needed, how it is needed and when it is needed. The fact is, it is not always possible to be physically present to solve a problem. The rise of mobile devices ensures it is never too far from the terminal.

Conclusion
It is clear that market and technology developments are prompting operators to look at terminal automation in a new light: as a strategic asset that can help them navigate unpredictable market conditions.

The fragmentation and runaway complexity of today’s multi-terminal sites is a reality that must be addressed. Equally, operators are under pressure to support evolution within their businesses, such as the rise of worker mobility and data analytics for better decision making. At the same time, they must defend against mounting safety and security risks.

Thankfully, a new generation of terminal automation solutions have emerged that allow operators to achieve all of these tasks in a single, integrated package, delivering unmatched operational control and scalability, and the ability to drive down costs for greater profitability. Crucially, these solutions can free operators from previous administrative burdens and allow them to focus on what they do best.

Reference

To learn more about Honeywell’s Terminal Operations, please visit: http://hwll.co/TerminalOperations

For business, related inquiries, please contact: HPSmarketing@honeywell.com