

Logistics Transformation With Automated Yard Management



e c o s y s t m

An automated yard management system can alleviate logistics challenges by providing full visibility of vehicles, containers, goods and people.

Author Summary

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The digitalisation of business activities is accelerating rapidly. Digital technology is driving business transformation, creating new business models, and radically changing the ways we live and work. It is also increasing efficiency and levels of automation.

Cloud technology is becoming the norm as organisations seek much greater agility to address competitive and unpredictable markets. Internet of Things (IoT) technology is digitalising the physical world and is being used in many industries that have been slower to adopt new and emerging technologies, such as Utilities, Manufacturing, and Logistics.

Artificial intelligence (AI) is being integrated into today's technology solutions and is using huge volumes of data to automate increasingly complex tasks. Voice and visual analytics are being built into many of these solutions.

The yard environment, in many distribution, logistics and manufacturing centres, remains a late adopter of new technology. Typically, data is not being leveraged fully, and processes are inefficient and often unsafe and insecure.

For yards to be competitive, processes need to be digitalised through the use of cloud, IoT and AI technologies. This digitalisation not only drives efficiency but also provides data which can be fed into other enterprise applications and used to address customer demands - and more effectively, reduce costs, optimise supply chains, and increase working capital. Toolkits such as Intel's OpenVINO offer AI, cloud and IoT functionality to yard management solutions and can be used as an efficient means of creating features such as computer vision, audio, and recommendation systems.

This whitepaper, sponsored by Alfabet in partnership with Intel, discusses the challenges faced in yard management activities, and how these challenges can be addressed by automated yard management solutions. It also describes how one of the world's largest FMCG companies has benefitted from using an automated yard management solution. The data cited in the paper, is from the global Ecosystem AI study, that is live and ongoing on the Ecosystem platform, providing real-time market insights.

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What is a Yard Management System?

A yard is a logistics hub for large volumes of goods and is a critical component of supply chains.

A yard is a logistics hub for large volumes of goods and is a critical component of supply chains. The movement, docking, storing, monitoring, authenticating, and transferring of these goods requires complex management processes, many of

which are manual and not seamlessly integrated into yard management or supply chain processes.

A yard management system enables the movement of vehicles and goods within logistics hubs. It typically includes gate management, warehouse management, transportation management, labour management, slotting, and dock scheduling systems.

Key Challenges in Yard Management:

- **Unscheduled or untimely arrivals of carriers.** This creates bottlenecks and disrupts scheduling and supply chains. It also makes delivery times unpredictable and impacts repeat business with customers.
- **Inefficient scheduling.** Long waiting times, congestion, production bottlenecks and unnecessary costs, typically caused by poor scheduling and human error.
- **Lack of shipment and trailer visibility.** This makes the shuttling of goods between plants and distribution centres less efficient
- **Inability to monitor operations for safety, security, and compliance violations.** Security and safety processes, for authenticating and checking in and out drivers, vehicles, and other operatives, are often manual, time-consuming and error prone.
- **Inconsistent processes.** It is difficult to ensure that authentication, checking in and out of drivers and vehicles, and damage are recorded in a consistent way.

Challenges of Yard Management

There are many inefficiencies in yard management processes.

Manual processes and lack of process integration create errors and do not allow execution to be as fast as possible. Yards are seeking to offer faster, more efficient, and cost-effective services to their stakeholders.

Ecosystem research shows that Manufacturing, Utilities and

Logistics companies are actively seeking to invest in AI and emerging technologies, to solve many of the business challenges – especially in inventory management, asset performance management and supply chain optimisation (Figure 1).

A specialised yard management solution can help mitigate many of these challenges in these organisations and address the priorities listed above.

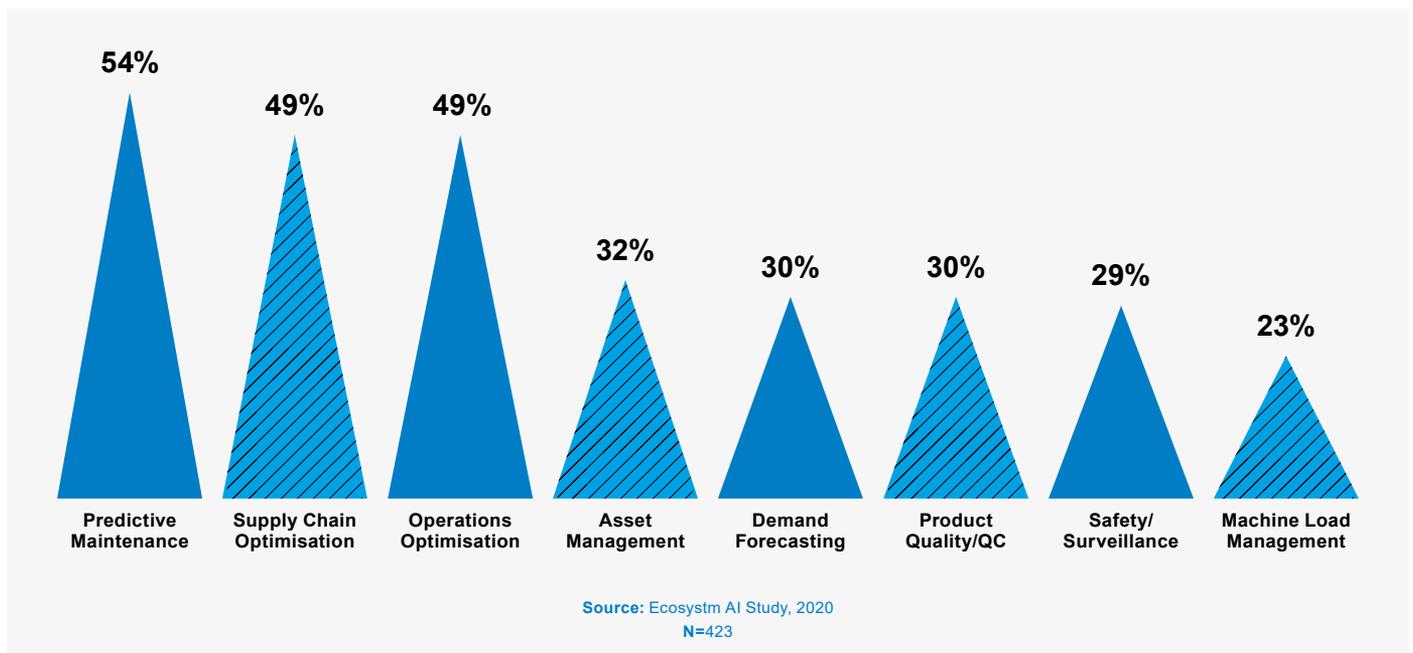


Figure 1. Top Technology Priorities - Manufacturing, Utilities & Logistics

Yard Management Solutions

One of the ways in which the issues and challenges of yard management can be addressed is by using a specialised yard management solution.

These solutions oversee the movement of vehicles, containers, goods, and people within a logistics hub.

Today's yard management solutions are designed to better synchronise yard operations, loading docks and gate check-ins. They aim to increase operational efficiency within logistics facilities - in particular, scheduling and tracking container

movements, availability, and loads.

Automated yard management solutions have emerged which offer additional functionality and eliminate some of the most cumbersome, error prone and inefficient manual tasks. They leverage cloud and IoT to offer AI, to provide agile, scalable, flexible and cost-effective ways of making yards and supply chains more efficient and competitive. Ecosystem research shows that organisations in the Manufacturing, Utilities and Logistics sectors are planning to increase their spending on AI (Figure 2).

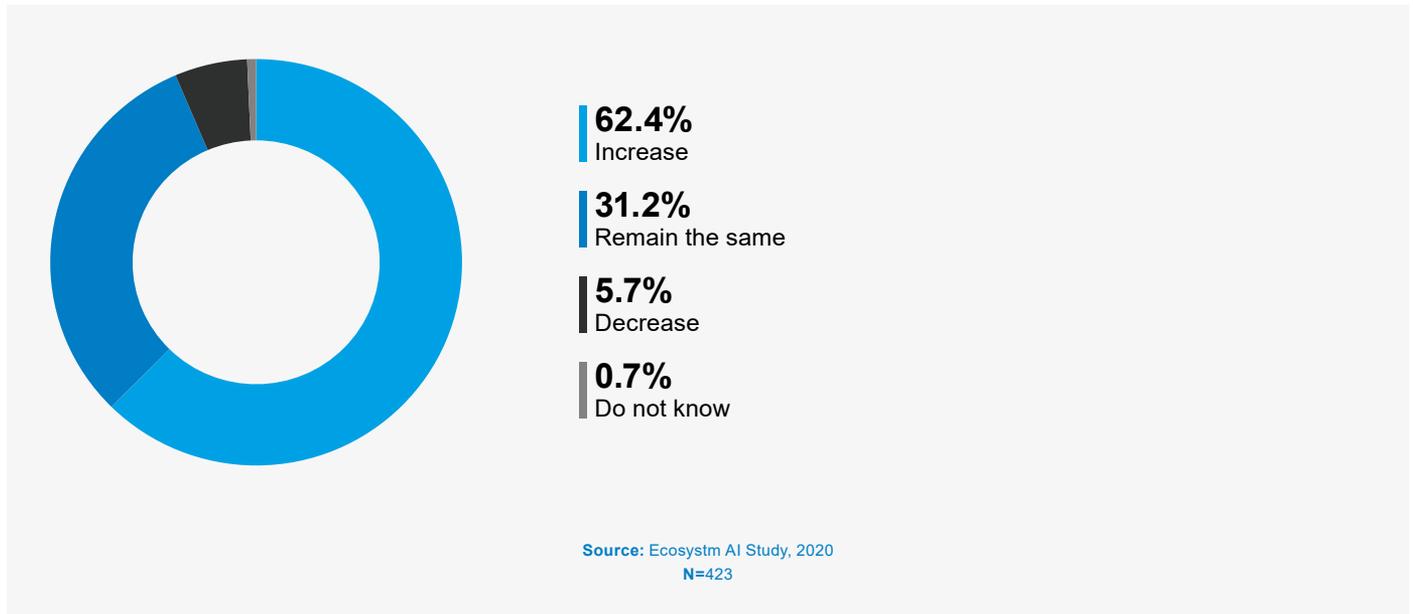


Figure 2. AI Spending Propensity in the Next 12 Months - Manufacturing, Utilities & Logistics

Automated yard management solution features include:

- **Automation of logistics** processes with limited human intervention.
- **Provision of real-time information** of all activities and movements, allowing end-to-end management of flow of goods (from staging to docks to fill orders) in an efficient manner.
- **Time slot booking**, dwelling time measurement, and automated door and parking assignment.
- **Automated number plate recognition** and facial recognition.
- **Sterile area detection.** There are some areas where no humans or even objects are permitted. This feature detects the presence of humans or any objects in those areas, and automatically triggers the warning system, when a violation is detected.
- **Full integration.** Yard management systems need to be integrated with other IT systems to create greater efficiencies. Important systems with which to integrate yard management include, supply chain management (SCM) systems, ERP systems, fleet management systems and Overall Equipment Effectiveness (OEE) systems.
- **Automated communications.** The system allocates and manages transport orders to execute goods movement decisions. As each activity is completed, notification is made which triggers subsequent decisions or provides alerts if there are any problems.

Toolkits have been developed on which automated yard management systems can run. They offer rich functionality and allow automated yard management solutions to add new features as needed. For example, Intel OpenVINO enables developers and their solutions to benefit fully from AI, cloud, edge computing and IoT technologies. It enables deep learning inference from the edge to the cloud. Importantly for yard management, it accelerates AI workloads, including computer vision, audio, speech, language, and recommendation systems.

Intel is working closely with independent software vendors (ISVs) to create IoT market-ready solutions (IMRS). Its first IMRS partner in Indonesia, Alfabeta uses OpenVINO for its solution, which is a heavy user of computer vision, for tasks such as facial and number plate recognition. Through ISVs such as Alfabeta, Intel is targeting a variety of industry segments in addition to yard management.

Benefits of Automated Yard Management

Broadly, automated yard management increases efficiency and competitive advantage, cost effectively.

It reduces shipping delays and optimises loading and unloading. It allows drivers, seafarers, and air freight professionals to spend more time transporting goods and less time being held at logistics facilities. Automated number plate and facial recognition improve and enhance security which is becoming increasingly important.

Additionally, data gathered from yard operations can be used to make enhancements and improvements to overall performance. Automated yard management tools create the opportunity to make logistics a more data-driven activity. Integrating yard management data with other enterprise data sets can enable enterprises to make better decisions throughout the supply chain.

Key Benefits of Automated Yard management include:

- **Effective control** of inbound and outbound logistics processes.
- **Transparent procedures** and real-time monitoring to ensure even utilisation of loading/unloading docks and personnel while significantly reducing vehicle wait and processing times.
- **Sales improvement** by increasing on-shelf availability.
- **Increased working capital efficiency** by improving inventory management cycle periods.
- **Operational cost savings** such as man-hour efficiency for manual work and reduction of damage cost.
- **Reduction in error rates** as manual activities are reduced.
- **Integration with other enterprise applications** such as SCM, ERP and fleet management systems.

01



Reduced Errors and Data

Automation leads to reduced errors. It also provides data which can be used to improve processes and integrate with other enterprise systems.

02



Sales Improvement

Sales improvement by speeding up inventory cycles and making goods available more rapidly.

03



Reduced Operating Costs

Operational cost savings on man hours of damage and more efficient use of assets.

04



Control and Transparency of Logistics Processes

Real-time monitoring to ensure correct usage of assets and personnel. Effective control of inbound and outbound logistics processes.

Figure 3. Leading Benefits of Automated Yard Management

Conclusion

Yard management is a critical component of supply chain management and plays a key role in overall enterprise effectiveness and efficiency. Poor scheduling, human errors, a lack of visibility, weak security, inconsistent processes, limited integration into other enterprise processes, and wasted data make many yard management systems inefficient and uncompetitive.

AI, IoT, and cloud technologies are enabling the development of highly effective automated yard management solutions. These systems can transform yard management by automating processes - using sensors and data analytics, they increase efficiency and support the digitalisation and optimisation of supply chains and other enterprise operations.

Logistics and yard management are increasingly important competitive differentiators. Speeding up inventory cycles is critical to increased working capital efficiency as well as responding to changes in customer demand swiftly. Ultimately, making goods available more rapidly, drives sales and market share.

Less damage to goods, more efficient scheduling, greater transparency, and less human error leads to lower operating costs. So, automated yard management has a positive impact on both the top and bottom lines. The solution can be used in all industries that have a high dependence on supply chains, such as Manufacturing and Transportation.

Case Study:

FMCG companies are constantly striving for ways to increase efficiency and improve inventory management cycles. They want their products to spend as little time as possible in transit or/and detained at logistics hubs.

One of the world's largest FMCG companies wants to improve efficiency in the inbound logistics area of its Skin Care factory in Indonesia. The company is working with Intel and Alfabeta to achieve its objectives. It is automating multiple business activities for performance improvement.

Processes Automated:

- The use of a time slot booking system algorithm. This enables a slot booking systems for unloading activities.
- Supplier registration and integration to time.
- Unloading time measurement.

Key Solution Features:

- Facial recognition
- License plate recognition
- Dwelling time measurement
- Sterile area surveillance and detection

Benefits Derived:

- Cost reduction
- Reduction in human error
- Cycle time reduction
- Data collection for further analysis

This white paper is sponsored by Alfabeta and Intel. It is based on the analyst's subject matter expertise on the area of coverage in addition to specific research based on interactions with technology buyers from multiple industries and technology vendors, industry events, and secondary research.

The data findings mentioned in all Ecosystem reports are drawn from Ecosystem's live and on-going studies on the Ecosystem research platform. This document refers to data from the global Ecosystem AI Study, based on participant inputs that include decisionmakers from IT and other Lines of Business, from small, medium and large enterprises.

For more information about Ecosystem studies visit www.ecosystem360.com

About the Author

Andrew Milroy is a well-known and respected thought leader and speaker in the APAC region. With more than two decades of experience in the technology sector, Andrew has worked with clients in a variety of tech domains including cybersecurity, cloud computing, IoT, blockchain, service provider strategies, and customer experience. His most recent work has been focused on the current challenges in technology markets, cybersecurity and digital transformation.

Since moving to Singapore in 2011, he has held regional leadership roles with Frost & Sullivan and Ovum (now Omdia). Prior to working in Singapore, Andrew gained invaluable technology knowledge and insights while working in Europe, the United States, and Australia.

Andrew is frequently invited to speak, chair and moderate at major technology events. He is also widely quoted on the global broadcast media, including BBC, CNBC, Bloomberg and Channel News Asia.

Andrew has a BSc from Newcastle University (UK), an MA from Middlesex University (UK) and an MBA from MGSM (Australia). Andrew is a long suffering Sheffield United supporter and enjoys hiking and running in his spare time.

About Alfabeta

[Alfabeta](#) is an artificial intelligence company that focuses on creating tailored artificial intelligence solutions using computer vision and Internet of Things.

Alfabeta has proven experiences in powering clients ranging from multinational and national enterprises, as well as the government institutions.

Its AI solutions can be implemented by companies in various business sectors (such as manufacturing, logistic, mining & energy, healthcare, traffic management, retail, advertising, building & property management, and banking) as well as in modern society to resolve complex issues.

About Intel

The [Intel® Solutions Marketplace](#) is a new online platform to drive collaboration in a new data-centric landscape. You can explore offerings and network with Intel partners. For partners who have posting access, the Intel Solutions Marketplace enables you to network and co-create with industry providers, differentiate your offerings, and showcase them to enterprise end customers.

For information on Intel OpenVino, go to:

<https://software.intel.com/content/www/us/en/develop/tools/opencvino-toolkit.html>

About Ecosystem

[Ecosystem](#) is a private equity backed Digital Research and Advisory Platform with global headquarters in Singapore. As a global first, Ecosystem brings together tech buyers, tech vendors and analysts into one integrated platform to enable the best decision making in the evolving digital economy. The firm moves away from the highly inefficient business models of traditional research firms and instead focuses on research democratisation, with an emphasis on accessibility, transparency and autonomy.

Ecosystem's research originates from its custom designed "Peer2-Peer" platform which allows Tech Buyers to benchmark their organisation in "real-time" against their industry or market. This bold new research paradigm enables Ecosystem to provide Tech Vendors access to ongoing and real time Market Insights in an affordable "as-a-Service" subscription model.



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