



Building a business case for investing in a terminal operating system.

The challenge of growth

The challenge of growth confronts leaders of ports around the world. You are always looking for new ideas to improve your operation and extract more value from it.

Are huge capital investments in cranes or automation technologies the only real path to increasing your income? What are your points of leverage to achieve cost savings or increase revenue?

These are questions the leaders of ports ask us on a regular basis in relation to investing in terminal operating system (TOS) software. We think investing in TOS software can actually make a real difference to your growth prospects, in ways you may not have even considered.

This white paper looks at some of those areas and how you could make a difference to your port by investing in a TOS.

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What is a terminal operating system?

Terminal operating system (TOS) is a term used to describe a relatively broad range of software products with a broad range of capabilities used by ports. When we refer to a TOS in this white paper, we are referring to enterprise-scale software that a port would use as a key part of their supply chain to manage the movement of containers and other cargo.

By using a TOS, ports gain visibility to information that helps them make more informed and timely decisions, improving their ability to manage assets, labor, equipment and port workload.

Master Terminal is Jade Logistics' TOS product.



The leverage points with a TOS

Handling your money

Terminal handling charges (THC) levied on shippers are at the core of a port's revenue model, reflecting the major costs of a terminal loading and unloading containers and other cargo from ships. While the exact structure and level of THC can vary widely from port to port, and country to country, the common feature is that THC form a major part of a terminal operator's revenue.

In the ports we have assessed, THC revenue can make up to 80-90% of gross income. The leverage point here is reducing the cost of delivering terminal handling services. That is, by delivering these services more efficiently, a port can extract a greater surplus from the fixed income of THC. For ports we have looked at, the approximate breakdown of these costs on an annual basis is:

- 50% is the cost of labor
(which equates to 44% of total revenue)
- 25% is materials and consumables
(fuel, bunker costs and other supporting activities)
- 10% is administration
- 15% depreciation
(reflecting the large capital outlays a port makes in terms of cranes, tugs, buildings, dredges and so on).

How can a TOS contribute?

More blood from the stone

The most obvious way of achieving a return on your investment in a TOS are productivity gains. That is, increasing your efficiency in delivering the services that underlie your THC, and thereby reducing your cost of delivering services.

A TOS can help by giving you visibility to information that enables a more efficient operation, by answering key questions about how to manage the port:

- How often are we moving a container?
- What sort of utilization are we getting out of our storage areas?
- How long have we got containers sitting in different areas?
- Where are potential choke points?
- How long does it take to process a container through our yard from start to finish?
- How efficiently is equipment being utilized?

In the yard, a TOS improves planning decisions about cargo movement and provides real-time monitoring and review capabilities. You can support your labor force, a port's biggest cost, to work more efficiently, but also ensure expensive capital equipment is utilized more efficiently.

The TOS used within each port becomes critical.

It must be able to handle specialized cargo moving through the facility as well as provide accurate data for shipping companies.



Some TOS' include mixed cargo capability within the same system, adding a key productivity benefit for ports with diverse cargo types.

Other opportunities for efficiency gains include:

- Improving health and safety reporting to minimize lost productivity or expose risk of incidents.
- Interfacing automatically with other systems, especially with finance systems to reduce invoice processing time and improve accuracy.
- Improving the management of gate operations to optimize turnaround times, decrease truck queues and maximize efficiency of railway systems.

The bottom-line opportunity: plugging the leaks

A key area to achieve additional returns from investing in a TOS is improving the capture of services outside the THC—revenue opportunities that might be “leaking” because they are not being properly recorded and invoiced.

Ports are traditionally focused on delivering their core services as efficiently as possible, and less on maximizing revenue from additional services outside the standard THC. A TOS can ensure these are properly tracked and appropriately invoiced.

An effective TOS will ensure additional revenue is derived from additional cargo moves (over and above what is required to delivering on the THC), and from the provision of services outside the THC agreement, such as reefer monitoring.

Other common revenue leakage examples include empty container yard activities such as fumigation, inspection, pre-tripping, simple repair, probing and washing. Being able to measure these activities accurately and integrating them with invoicing ensures revenue is maximized.

Warehousing is another example. Some TOS enable ports to create virtual warehouse areas anywhere in their port and ensure storage charges are accurately captured and properly invoiced.

Non-THC income can represent an additional 10-20% of a port's annual income. Simply capturing “leaked” revenue with a TOS results in this additional revenue going straight to the bottom line.

The TCO of a TOS

Main cost components of a TOS:

- Upfront licensing
- Scoping and implementation
- Server and mobile computing hardware
- Ongoing support and maintenance, including infrastructure

There are clear leverage points in implementing a TOS. Efficiency gains are always realized by implementing a system, and the capture of ‘leaking’ revenue for additional services delivers income straight to the bottom line.

These gains have to be set against the total cost of ownership (TCO) for purchasing and operating a TOS. As with any technology purchase, it is important to understand this TCO, not just the upfront license costs.

A typical structure would involve an upfront software license fee (a perpetual right to use the software code) as well as a fee for implementing the system in your port (business analysis, software configuration, training and go live). Implementation may typically represent around 80% of this upfront cost.

Ongoing software support and maintenance cost is normally based on a percentage of your upfront license fee, payable on an annual, quarterly or monthly basis. Industry percentages can vary widely depending on the quality and extent of support provided.



Although less common in the TOS software sector, some providers are moving away from an upfront license and ongoing support and maintenance approach, to a flat monthly fee from purchase.

While this pro-rata approach can be beneficial in some areas of software investment, the long lifecycle of a TOS means paying an upfront fee followed by support payments usually delivers lower TCO to the port.

It's important to understand from a cost perspective what the ongoing maintenance and support fees provide you with. Most vendors will provide an agreed level of support and ongoing product enhancements for that investment. Better value is obtained when your vendor also provides full management of your back-end infrastructure (e.g. the performance and updating of the servers that host your system, the software upgrade process, keeping the underlying database current, disaster recovery (DR) management).

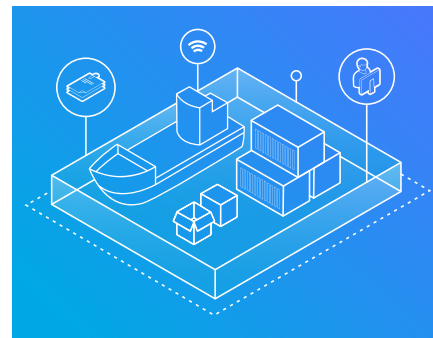
Other costs to consider in implementing and running a TOS are the computer hardware investments. Often ports require new on-premise servers or an external data center to host their TOS. Either option requires upfront and ongoing investment that needs to be factored into your investment.

Increasingly, having mobile devices to access the TOS throughout the port area is critical. Traditionally, TOS systems have required bulky proprietary handheld devices that can add considerable expense. TOS systems should now be using generic, non-proprietary commodity type mobile devices with wide commercial availability, such as iPads or Android-based tablets, that can access your TOS through browsers or apps, creating a more affordable and flexible option.

Risks to consider

No consideration of ROI would be complete without attention being paid to the possible risks of investing in a TOS. In our 25-year experience of implementing these systems, we have identified five key areas of potential risk that a port needs to consider and mitigate.

- **Process change:** there is a trade-off between having a TOS that mirrors your existing business process, and adapting your business process to match to the way a TOS is designed to manage it. The less customization required, the lower the cost and lower the risk of problems. A good TOS vendor will be able to provide as much industry experience as technical knowledge to ensure your port is using industry best practices.
- **Integration:** you need to clearly understand where integration with existing systems is required, ranging from simple interfaces to your financial systems through to more challenging EDI connections. Integration is becoming increasingly easier and smoother as technology evolves, but attention should be paid to the scope and cost of achieving it.



- **Project scope:** both process change and integration must be carefully managed to ensure your TOS project is completed on time and within your budget. A competent vendor should help you to manage this more effectively.
- **Change management:** a TOS is a significant piece of software and requires careful change management across all affected areas of your business. That means early involvement and ongoing training for your people. It is important that they understand the reasons why a TOS is being implemented and how they can use it to improve the way they work. A TOS is only as good as the skills of the people using it.
- **Commitment across the organization:** It is important that all levels of the organization support the TOS implementation. Clear commitment from the governance levels of the organization, support from management to release resource into the project, and effort from all contributors is a major component of all successful implementations.

TOS purchase risk factors

- Process change requirement
- Integration complexity
- Project scope creep
- Change management challenges
- Organizational commitment

Invest in growth and reap the rewards

Investing in growth doesn't need to be simply about buying that next mobile harbor crane or straddle carrier. 'Softer' options exist, particularly the potential of leveraging the benefits a TOS can provide to gain efficiencies, but also to ensure you are able to identify and drive revenue from all of the services you provide to your customers.

About Master Terminal from Jade Logistics Group

Designed to handle all cargo types in one integrated system, Master Terminal is the world's leading terminal operating system (TOS) for mixed cargo ports.

Master Terminal is licensed at over 120 terminals worldwide, from vehicle terminals in Italy to steel terminals in North America.

Implementation is the key to success, and our implementation record is second to none in the industry. Our proven and robust methodology, partnership approach, thorough training and unrivaled implementation timeframes deliver tangible results fast.

Jade Logistics has been designing, building, and supporting innovative logistics software since 1993. Our experienced people understand the global logistics industry and are the foundation on which we build long-term relationships with our customers.

We have offices in New Zealand, Australia, USA, the Netherlands, the United Arab Emirates, and Indonesia.

*For more information, visit us at **jadelogistics.com***