



ACTIW LOADMATIC®

INVESTIGATION ON FUTURE TRENDS IN LOGISTICS AND THE POTENTIAL OF AUTOMATED TRUCK AND CONTAINER LOADING

ACTIW Systems White Paper 2014

ABSTRACT

Logistics operations gain increased attention across industries throughout the world. Traditionally, the main focus has been on improving production efficiency when seeking sources of operational excellence and competitive edge. Today, logistics costs in certain product categories have grown to be over 50% of total costs, which necessitates a focus shift. Automation brings efficiency and scale. Still, automation adaption rates remain fairly low, even in developed markets. Automated truck loading is a low-hanging fruit that has been disregarded by many.

Read further, if you wish to:

- update your views on future megatrends and their effects on logistics
- learn where leading logistics experts see largest potential for supply chain efficiency gains
- understand where automated loading is viable and what Actiw's automated truck and container loading solutions bring to the table

This white paper is based on interviews of prominent logistics professionals across industries from around the world, who share their thoughts on future trends in logistics, supply chain development and automation.

We want to express our gratitude to the following people for offering their time and sharing their valuable insights with us:

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TRENDS

WHAT IS DRIVING CHANGE?

“THE SPOTLIGHT IS MOVING TO POST-MANUFACTURING OPERATIONS, AN AREA THAT HAS BEEN GROSSLY NEGLECTED IN THE PAST. SIGNIFICANT OPPORTUNITIES EXIST IN CUTTING COSTS, DELIVERING VALUE TO CUSTOMERS AND SPEEDING UP THE ENTIRE CASH CYCLE.”

Indeed, a clear shift in focus is underway. The main trends driving change are familiar, but focused on logistics:

- Rising costs
- Escalating demand for service
- Closer cooperation

RISING COSTS According to the latest survey by Aberdeen Group, cost cutting is still the strongest driver for logistics development, also in 2014. Costs are soaring for a multitude of reasons. Lean philosophy is, thus, steadily gaining popularity also in logistics. It is natural, as it supports continuous improvement and efficiency gains through removal of unnecessary and unproductive working steps, in other words waste. However, on medium- to long-term it is labor, or more precisely the lack thereof, which will have the greatest impact on the way logistics needs to be organized.

“Nobody graduating, especially from the Western school system, dreams of being a truck or a forklift driver anymore. In the coming 5 years, 20% of warehouse workers and truck drivers in Europe will retire. This has not hit us yet with full force, but it will. 3PLs (3rd party logistics providers) are starting to feel the pain already.”

Deutsche Post AG (DHL) envisions the future of logistics in their recent study. The study outlines 5 possible scenarios driven by different mega trends; they range

from consolidated mega city environments to paralyzing protectionism and high need of local adaptation and resilience driven by climate change. One common nominator for each scenario is the scarcity of labor, everywhere.

“China is no longer a low labor cost country. Automation is coming fast to Asia.”

This means that the remaining, more expensive workforce must be allocated for the most value adding tasks. Labor scarcity is, thus, one of the strongest driving forces pushing for consolidation and automation.

ESCALATING DEMAND FOR SERVICE *“Customers require more flexibility, timely & frequent deliveries and are moving a lot of tasks further back in the value chain. Before, our production batches were in the range of 400 pallets for certain products. Now, batches are 40 pallets or smaller. This drives the need for higher flexibility, handling capacity and stricter control in the entire supply chain.”*

Concentration on core capabilities and entrusting more tasks to vendors and other 3rd party providers has been a management mantra for some time. Lately, especially in the FMCG (Fast Moving Consumer Goods) industry, this development has been accelerated due to steadily growing e-commerce and a change in consumer buying preferences.

Sources:

¹ Aberdeen Group, CSCO 2014: Top Three Supply Chain Execution Priorities, 2013

² Deutsche Post AG, Delivering Tomorrow: Logistics 2050, 2012

E-commerce has seen double digit growth for years. It is eventually becoming so significant that it cannot be ignored any longer. This implies more flexible and smaller deliveries, more SKU's (Stock Keeping Unit) and growing number of returns processing.

At the same time, consumer buying preferences are changing also in traditional retail channels. A general trend in the retail industry is a movement away from large hypermarkets towards smaller and more centrally located convenience stores.

"Tesco is putting up 250 new format stores in inner cities in the near future. Also home deliveries are growing fast."

For logistics, the change means further concentration on picking, packing and other value adding services (e.g. re-packing and returns processing). These functions are usually quite labor intensive. Again, the challenge arises of how to allocate the available workforce to most value adding tasks and how to make their work as efficient as possible.

"The focus is on how to perform these processes cost-effectively. Lean principles and mechanization are often part of the focus."

CLOSER COLLABORATION Collaboration is the key point, when examining the key strategic development areas for 2014 in the Aberdeen study. Improving collaboration, both internally between departments and externally towards suppliers and customers, is seen as the key priority among the respondents.

"Cross functional collaboration is one of the key challenges to drive supply chain efficiencies and working capital optimization."

The underlying message behind collaborative priorities topping the list is the fundamental need to improve speed and visibility across the supply chain. Improving collaboration affects directly the challenges in increased costs, escalating customer service demands, and increased complexity.

"We are already experiencing this with 3PL contracting. In Western Europe, a 3-year contract might not be long enough. 5-7 year contracts give 3PLs a real opportunity to invest in mechanized solutions and build more cost-effective solutions."

Source:

³ Aberdeen Group, CSCO 2014: Top Three Supply Chain Execution Priorities, 2013

OPPORTUNITY

WHAT IS TRUCK & CONTAINER LOADING AUTOMATION BRINGING TO THE TABLE?

“MONEY IS WASTED EVERYWHERE, THERE IS ROOM FOR IMPROVEMENT AND MORE INTELLIGENT SOLUTIONS IN ALL PARTS OF OPERATIONS.”

In order to truly understand where capital investments yield best returns, a total cost and benefit perspective must be taken. Logistics cannot be viewed from a local, narrow angle.

“A warehouse automation project in UK might be competing with a production plant investment in China. We must be addressing the big picture and choose the most economically beneficial projects.”

This, however, does not mean that low-hanging fruits would not exist.

“You should look at the total product cycle; there are many areas that have been neglected for a long time.”

Generally, four factors define the feasibility of a development project or investment:

- Necessity
- Ease
- Impact
- Safety

NECESSITY Sometimes investments are made out of necessity, when the possibility to continue as before no longer exists.

“It is analogical to a dangerous traffic intersection. Many times, no traffic lights are installed before somebody gets run over. The best way to get an investment approved is to have a collapse in the local market. That underlines that you have a real problem.”

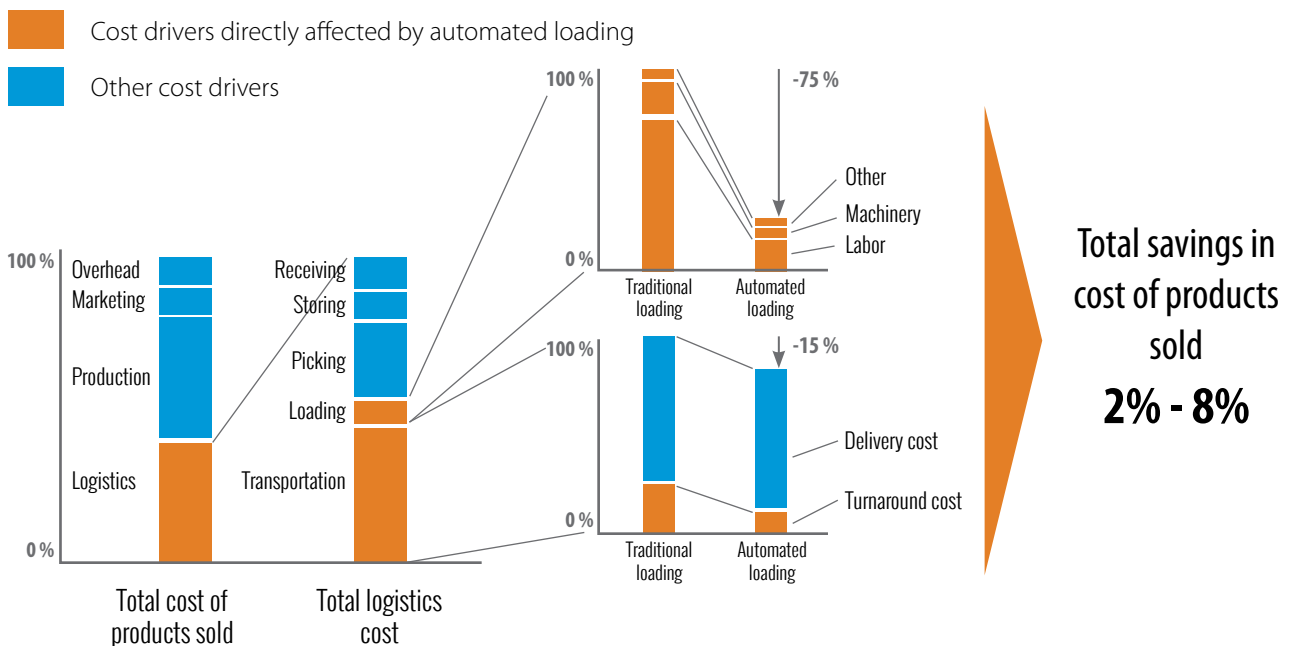
EASE New technological innovations or other fundamental changes in the operational environment might open up the possibility to collect quick wins. In these “no brainer” situations, the risk-reward ratio is very compelling and thus simplifies the investment decision.

IMPACT Projects compete with each other. In its simplest form, investment initiatives with the greatest impact, i.e. the best return on investment, will be implemented.

SAFETY A safe working environment is an issue that no responsible corporations are ready to compromise. Thus, improved safety is increasingly driving investment decisions. It is a question of risk management.

Besides personal tragedies, accidents induce many types of costs, including damaged equipment, medical & legal expenses, lost working time, production down-time, investigation & corrective measures, finding & training replacement workers, and bad press.

Effect of truck & container loading automation on total cost of products sold:



Let us investigate the potential of truck & container loading automation from a holistic, total-cost perspective. The improvement potential will be examined from the following angles:

- Total cost
- Cost of logistics
- Loading
- Transportation
- Total effect

TOTAL COST The total cost structure varies widely between markets, industries and even product categories. Production (or procurement) and logistics walk hand in hand and tend to be major cost drivers regardless of the business environment.

Logistics functions are developed in the intersection of production and customer requirements. Logistics steadily grows in importance, but much remains to be done.

"In Western Europe, only about 30% of warehouses that would be viable for automation are automated. In other areas besides storage, as in loading, the figure is significantly lower."

COST OF LOGISTICS Total logistics costs vary roughly between 10% and 50% of revenue in different industries. Revenue includes profit, which means that the relative share of the logistics cost out of all costs is even higher.

In most cases receiving, picking and loading are manual operations. Continuous cost cutting pressures and la-

bor scarcity, combined with changing customer requirements, adds pressure to find effective ways to improve the efficiency of these functions. In loading, the restrictions or inefficiencies of traditionally available solutions have so far limited adaptation to automation.

LOADING Conventional loading operations are labor intensive. Loading automation eliminates unnecessary working steps in the loading process. Instead of a team handling the trailer or container and operating different forklifts and machinery, at best, a single operator can oversee the operation of several docking stations with significantly higher volumes.

In a typical setting, the loading function requires a fleet of machinery, forklifts, terminal tractors, side loaders etc. Machinery costs include the cost of owning/leasing equipment and the maintenance and energy costs. Automated loading systems make a large part of this fleet obsolete.

In addition, automation of the loading process also brings cost reductions in other areas, e.g. product damages, health & safety and order accuracy. When delivering special cargo, the possibility to use standard dry containers, instead of more expensive and scarce special containers (e.g. open-top containers or flat racks), brings great savings.

It is not uncommon to see loading automation, when applicable, to cut 75% of the costs associated with loading, yielding very competitive payback and return on investment figures.

TRANSPORTATION

"It is included in the 3PL contract."

"We are not paying for waiting time."

"It is free; the truck driver handles the loading anyway."

"This mentality has to go! It is time to really start cooperating and look at the efficiency of the total process. It does not matter who owns or operates the trucks. The waste is still there. Loading automation benefits are also there. It is merely a question of negotiation on how these benefits are distributed between different operators in the supply chain."

Trucks are meant for moving cargo. Trucks that stand still cause, in lean terminology, waste or ineffectivity in the total process. The importance of the total time of the loading operation, or turnaround time, is highlighted the shorter the delivery route is.

Let us take an example. First, we investigate the effect on a short delivery route, e.g. 1 hour back and forth, which could be the case in shuttle traffic between a production facility and a warehouse, or between central and local

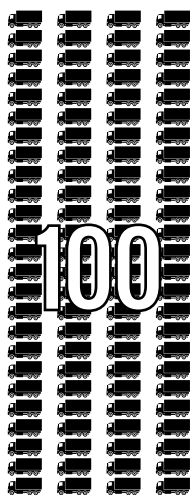
distribution centers. With traditional loading, the actual turnaround time usually varies between 45 and 90 minutes. We use 60 minutes in the example. This means that the trucks are standing still, waiting 50 % of the time for loading to complete.

If the total turnaround time can be cut to 20 minutes, the scenario changes dramatically. Now the trucks are waiting only 25 % of the total cycle, i.e. 20 minutes out of a total cycle of 80 minutes, compared to 60 minutes out of 120 minutes before. This implies that the truck fleet can be reduced by 33% (i.e. $1 - 80/120 = 33\%$). When considering the total cost of maintaining a fleet, the difference in cost between a truck standing still or moving is not very significant (mainly fuel cost). This means that the 33% reduction in fleet size is approximately equivalent to a 33% cost reduction in total transportation costs.

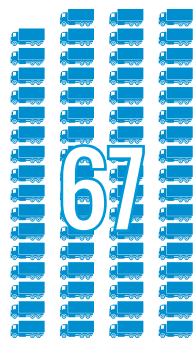
If the delivery route is longer in comparison to the turnaround time, the effect is not as drastic. Nonetheless, if the delivery route length is increased to 4 hours, the cost effects are significant. Following the same logic, the fleet size and equivalent costs can be reduced by 13%.

AUTOMATED LOADING REDUCES TRUCK FLEET SIZE

1 HOUR DELIVERY ROUTE

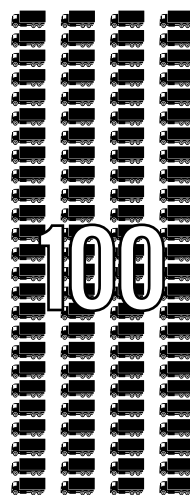


Traditional loading

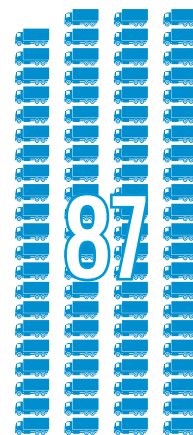


Automated loading

4 HOUR DELIVERY ROUTE



Traditional loading



Automated loading

TOTAL EFFECT When tracing back the benefits of loading automation to the total cost of products sold, we can see that the effect is significant. Depending on the case and the relative weights of different cost drivers at different levels, we usually arrive in a total effect of 2% - 8% of total cost of products sold.

REDESIGNING INTRALOGISTICS

WHAT OPTIONS DO TRUCK & CONTAINER LOADING AUTOMATION METHODS OPEN UP?

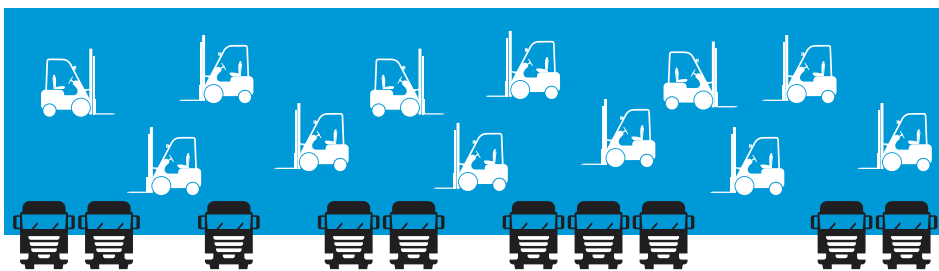
“NEW INNOVATIONS WILL CENTER ON RE-EXAMINATION GROUND-UP OF THE FUNDAMENTAL VALUES THAT HAVE DRIVEN BUSINESSES FOR A LONG PERIOD OF TIME.”

Including loading automation into the scope of warehouse and production facilities can open up new possibilities or fundamentally change the way operations can be designed. For example, often in the FMCG (Fast Moving Consumer Goods) markets, the greatest barrier for expansion and growth is to find suitable land site, resulting in higher capacity and throughput requirements for existing facilities. These requirements call for innovations and justify the use of latest technologies.

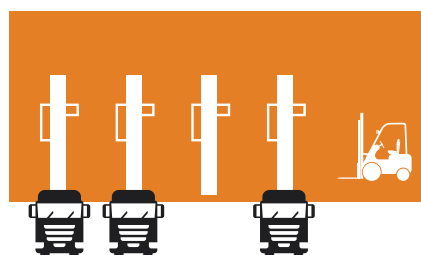
“Hypothetically, by freeing up 30 % more space from the loading area at a production site, the entire operation could be redesigned and total output could be doubled.”

EXAMPLE Let us imagine a major warehouse investment. The first and foremost effect of loading automation is that it will cut down turnaround times of trucks. Shorter turnaround times result in more accurate planning and less trucks waiting for loading. This way, the yard space can be more effectively utilized and the number of loading docks reduced. If turnaround times can be reduced to a third, from 60 to 20 minutes, theoretically the number of loading docks can be reduced by 67 %

MANUAL LOADING DOCK



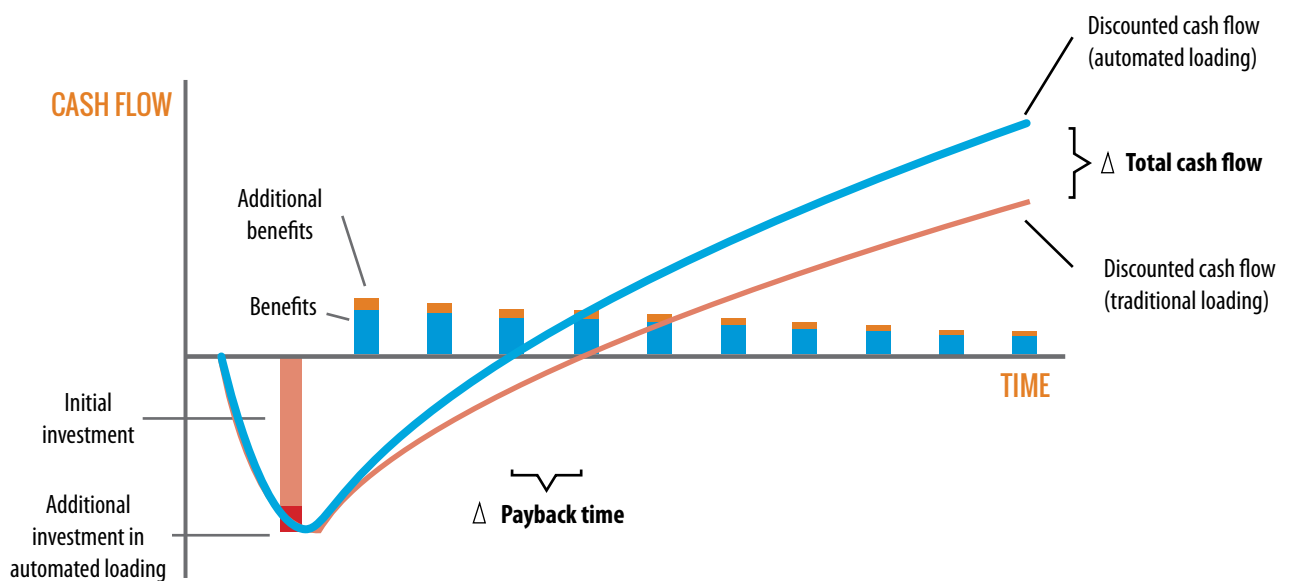
AUTOMATIC LOADING DOCK



In many situations a hybrid model, where automatic and manual loading docks are combined, is optimal. The familiar 80-20 rule applies. Automated solutions are best suited for handling the main material streams, i.e. 80% of the goods flow. For handling special cases, adding some manual loading docks provides the required flexibility.

"In my experience, optimization should always concentrate on the largest volumes. To optimize the last 20% is usually not worth the effort."

Loading automation streamlines the internal loading process and brings a multitude of efficiency gains. In many cases, including automated loading into the scope of a larger investment can cut payback time and increase ROI (return on investment) significantly with marginal additional investment.



Generally, loading automation is best suited for following environments:

- Production environments
- Shuttle traffic
- Cross docking
- Full pallet in – full pallet out
- Loading of special cargo

AUTOMATED LOADING BY ACTIW

WHAT MAKES IT SPECIAL?

“ACTIW’S SOLUTIONS HAVE FUNDAMENTAL APPEAL THROUGH BEING PRODUCT AND TRUCK NEUTRAL, REQUIRING NO ALTERATIONS. THIS MAKES, TO MY MIND, ACTIW THE CLEAR MARKET LEADER!”

Actiw LoadMatic and LoadPlate make automated loading as easy as it should be. Both systems are designed for regular, non-modified cargo space such as containers and trailers. This means that no alterations to the cargo space or substructures beneath the cargo are required.

LOADMATIC is designed for loading palletized goods. It is the last link in the end-to-end solution for fully automating pallet handling at the production unit or in the warehouse. In short, pallets are brought automatically to LoadMatic for loading. When the load is sequenced and transferred, LoadMatic simply loads the cargo into the container or truck in one push. LoadMatic can be seamlessly integrated to any automated production or warehouse systems.

LOADPLATE is a one shot loading solution especially suitable for loading complex cargo that is hard to containerize, is easily damaged or usually requires special shipping units. The load can be prepared safely in open air and loaded in one push. When loaded with unloading accessories, unloading can easily be performed in one pull.

Unique characteristics of Actiw LoadMatic & LoadPlate:

- No alterations needed to standard cargo space
- No substructures needed beneath the cargo
- No special equipment required at the receiving end
- Fast loading cycle (<5 minutes)
- Durable and reliable
- Easy to move and relocate
- Payback time in months, rather than years
- Proven technology

Contact the experts at Actiw to find out what kind of business impact automated loading could have on your business!





Actiw Oy is a Finland based manufacturer and systems integrator, specialized in intelligent and sustainable automated warehouse and loading solutions. Actiw has a solid track record with dozens of successful installations and pleased clients; Actiw's automated material handling projects have been executed since mid-1980. The company has invested strongly in developing their own, unique automated storing, sequencing and loading systems for the international market. For more information, please visit: www.actiw.com

Symbioosi Partners Ltd is a Helsinki, Finland, based sales development powerhouse. Symbioosi has prepared this white paper in cooperation with Actiw. For more information, please visit: www.symbioosi.fi



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