

Automated Lift Trucks **On the Double**



Automated lift trucks can increase picking productivity while maintaining the flexibility of a manual approach.

By Benny Forsman

To stay competitive, distribution centers (DCs) need to reduce costs while addressing numerous other challenges, such as increased numbers of smaller orders, reduced order lead times and ever-higher reliability requirements. Some companies have considered installing automated systems but have been discouraged by the high cost of changing the system to adapt to future requirements.

One emerging alternative involves retrofitting standard warehouse lift trucks with automation kits. Such a solution, if properly implemented, has the potential to deliver higher productivity while maintaining the flexibility of the manual method.

Retrofitting lift trucks automatically fetch empty pallets, follow the operators to each picking location, position the forks at the right height and deliver the goods to dispatch,

An automated lift truck with a full pallet travels to the dispatch area, and the system sends a new lift truck with an empty pallet to the picker. The picker never has to leave the picking area and can continue to work on the next order without interruption. (PHOTO COURTESY KOLLMORGEN)

leaving the operator free to start immediately on the next picking assignment. This approach typically provides 60% to 100% higher productivity than the traditional manual approach. The cost is considerably lower than alternative automation approaches because it makes use of relatively inexpensive and often already existing lift trucks. It can be adapted to new products or facility layouts, and the automated lift trucks can even be moved to different facilities.

DC Challenges

DCs face unprecedented challenges in today's difficult economic conditions. The slow economy, just-in-time manufacturing and the changing face of the retail industry have all combined to force DCs to deal with a larger number of smaller orders. At the same time, customers are demanding shorter lead times and higher levels of reliability. DCs are also faced with adapting to rapid changes in product mix and volumes.

These trends tend to increase unit labor costs at the same

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time that DCs are facing unprecedented pressure to reduce costs. Labor typically accounts for more than 50% of a DC's total operating costs, and a study shows that order picking accounts for more than 40% of labor costs or about 21% of total operating costs. Clearly, addressing today's challenges requires finding ways to better manage the order picking function and better utilization of the workforce.

Some DCs have addressed this challenge by attempting to automate order picking. Conventional automated systems, however, are designed for handling very high volumes of a relatively small number of products with similar sizes and shapes. It may be difficult, then, to justify fixed automated systems for low-volume operations. Also, traditional automated systems can sometimes be difficult to modify to adapt to changes in volume or product mix.

Automated Concepts

The automated lift truck concept presents an alternative approach to automation that fits a wide range of DCs. The basic idea of the automated lift truck method is to make the most of existing resources, including pickers and lift trucks, rather than starting over from scratch. This approach is based on a system solution that integrates with most warehouse management systems (WMSs) and picking technologies, such as pick-by-voice or handheld scanners.

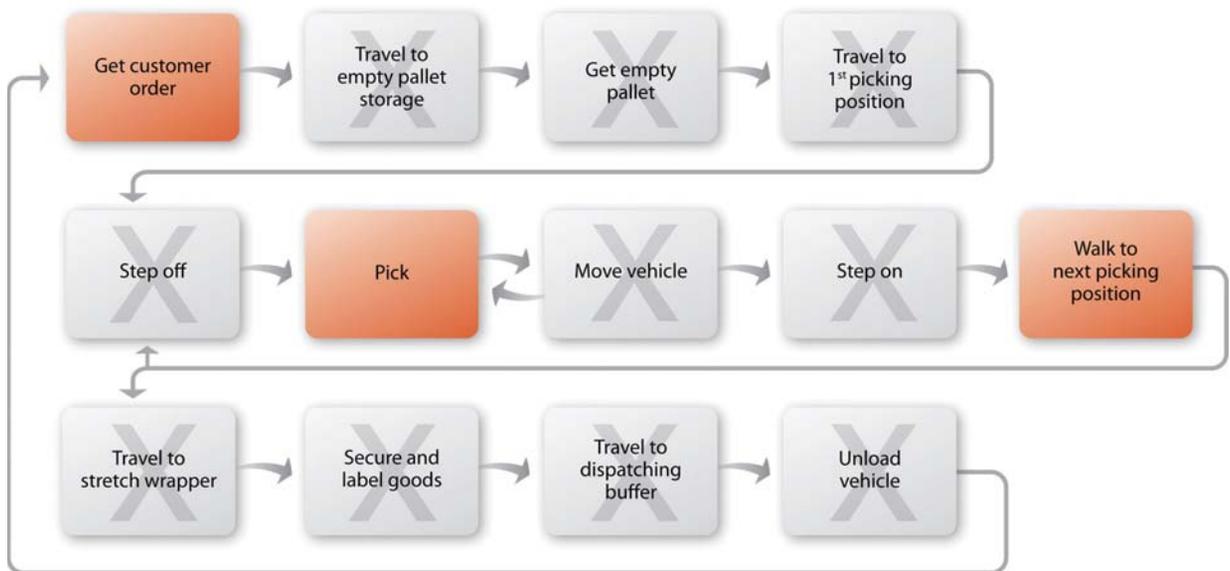
The WMS sends the customer order to the picker and the truck simultaneously. For example, the picker will get information via headset that the first pick for a new order is in location 24 in aisle five. The picker will walk to that location, which will normally be very close to his current location because

of optimization provided by the WMS. Simultaneously, the automated system will dispatch the lift truck to arrive at the same time as the operator. The lift truck arrives with the forks positioned at the proper height for efficient and ergonomic order picking. The picker picks the item, and the next order line item is then sent to the operator's headset. The truck automatically travels to the next position along with the picker. When the pallet is almost full, the system sends a new truck with an empty pallet to the picker. The truck with the full pallet automatically travels to the dispatch area.

Such lift truck automation kits are based on the same technology used in automatic guided vehicles (AGVs) commonly found in manufacturing environments. The kits provide support for all vehicle types, including order pickers, stackers, reach trucks, turret trucks and even large counterbalance lift trucks. These kits support all major navigation techniques, including laser, vision, spot and pilot line guidance along with multi-navigation approaches that combine various methods. The automation kits can support nearly any application so the automated lift trucks can continue to be used when needs change or even be transferred to a different facility.

Engineers design transport routes to efficiently use the retrofitted lift truck capabilities using an engineering layout studio. Software is provided for efficient route planning, traffic management for the fleet and integration with the WMS.

Vehicle controller programming is based on the IEC 61131-3 specification with open interfaces that allow the addition of third-party equipment. The



Automated lift trucks can increase productivity by streamlining the order picking process. Red boxes represent retained steps, while white boxes represent eliminated steps. (DIAGRAM COURTESY KOLLMORGEN)

ability to use the same platform on a wide range of applications means that only one engineering skill set needs to be learned. The solution provides efficient transport flow optimization, considering the current status of all fleet vehicles, the traffic situation and all current orders. The traffic manager avoids collisions and optimizes the flow of goods.

Productivity and Safety

The key advantage of this approach is that it eliminates non-value-added tasks that pickers otherwise need to perform, such as jumping on and off lift trucks, raising and lowering forks, fetching empty pallets and delivering full pallets. The time saved is transferred into higher order-picking productivity with a higher number of picks per hour, leading to lower operational costs.

Besides improving productivity, the automated lift truck approach can improve safety by eliminating injury-prone tasks, such as driving and getting on and off the lift truck and ensuring

the pallet is positioned at an optimal height for the picker. There is also significantly less risk of product damage and collisions with pickers or other automated or manual lift trucks, even in DCs where mixed lift truck traffic operates within the same aisle. The automated lift trucks travel in optimized routes at controlled speeds, helping to avoid injury or damage to goods, saving energy and providing longer lift truck life with lower maintenance expenses.

These systems can be changed to accommodate future changes in warehouse layout, product mix or volume. Problems that may arise with a retrofitted lift truck are limited to the individual truck, while the rest of the system continues to run normally.

Case Study: Coop

An example of how the automated lift truck method works in practice is provided by Coop, the second largest retailer in Sweden with 700 convenience stores, supermarkets and hyper-markets.

The company's DC outside Stockholm is one of the largest grocery distribution centers in Northern Europe. Coop evaluated fully automated and mechanized solutions but found that an automated lift truck solution was less expensive and more flexible.

Today, Coop operates 32 automated lift trucks at this DC. The vehicles are integrated with an existing pick-by-voice solution that addresses picking quality, and the automated lift trucks address the productivity challenge. The picker and truck work together as a team. The automated lift trucks are integrated with Coop's fleet of approximately 400 lift trucks. Picker productivity has increased by 100% by eliminating time spent on unproductive tasks, resulting in a substantial reduction in operating costs and an increase in capacity. **MHM**

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