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Warehouse Management:

Automation Delivers Near-Immediate Payback (IRR)

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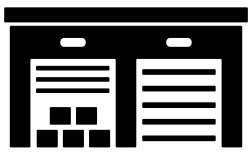
Executive Summary

Any sophisticated organization performs a financial review of potential projects to undertake in the form of an Internal Rate of Return analysis – IRR. The intention is to provide rigor to decision making and move forward with projects that have a short "payback period". The warehouse operations of a distributor are the "lifeblood" of the organization and a major cost of doing business. SME's (small to medium-sized enterprises) span the automation continuum from highly manual, paper-based operations, to lightly automated solutions that are not integrated with their core enterprise resource planning solution (ERP), to more sophisticated integrated zone/wave picking processes – this last approach is rare among SME's. This paper will focus on the benefits of a hybrid browser-based software-as-a-service (SaaS) cloud and mobile app WMS (Warehouse Management Solution) that are tightly coupled with fully-functional horizontal ERP (Enterprise Resource Planning) solutions. We will explore the quantifiable benefits for both transitioning from a manual solution to an automated, "pick by order", integrated SaaS solution as well as businesses that extend their automated, "pick by order", integrated SaaS solution to a zone/wave picking process.

Many studies have been conducted[1] on the benefits of real-time, automated WMS deployment including both mere automation, and implementing zone/wave picking. The most scientific studies were able to analyze the business KPIs (Key Performance Indicators) in warehouse operations by analyzing key operational metrics at an SME with advanced WMS technology integrated with ERP, versus one that is still operating with excel spreadsheets and other paper-based processes (or before and after if captured prior to implementation). They also examined the difference between basic automation (an excellent first step) and zone/wave picking approaches. These studies focus on more efficient picking, reduced training cycle -time, reduced carrying costs, reduced "dock2stock" cycle -time and associated cost savings as well as the quantifiable benefits of zone/wave picking - the take-away was average savings in the 20 - 70% range. Multiple NetScore WMS customers have cited overall **savings in excess of 60%** after taking the first step and implementing our automated, integrated WMS solution. The analysis below provides added granularity, but note, factors such as the specific features deployed and the company commitment to driving adoption can influence the outcome/results.



[1] Wave Picking Explained: Strategy, Benefits and Best Practices By Red Stag Fulfillment | Updated on January 1, 2025. WMS Cost Benefit Analysis By SCJunction. Calculating the True Cost of Productivity By kardexremstar.

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Expected Savings: WMS Tightly Integrated to ERP versus Manual Processes

There are many areas of potential savings from an automated WMS solution that is tightly coupled with fully-functional horizontal ERP, both indirect and direct. For simplicity, we will focus on direct quantitative savings that fall into three categories:

- **Decrease in Carrying Costs and Error Rates from Increased Efficiency**
- **Increase in Labor Efficiency/Decrease in Labor Cost**
- **Reduction in Training Costs**

Decrease in Carrying Costs and Error Rates from Increased Efficiency

The carrying cost of inventory is a very substantial cost component for distributors. Carrying costs are generally the expenses a distributor bears for keeping inventory in their warehouse(s). The components and make-up of these costs vary from business to business but generally include storage cost per square foot of warehouse space, labor, insurance for the average value of goods in the warehouse and taxes. Most distributors finance their inventory using a line-of-credit and these financing costs can also be significant, particularly in a rising rate environment. Quantifiable benefits experienced are as follows:

Carrying Costs

1. Based on research and customer feedback, conservative estimates for savings derived from implementing automated cycle-counting is 5% of annual carrying cost.
2. The average cost of goods (CGS) for an SME (small to medium-sized enterprise) is typically 20% of annual revenue. The carrying costs on average are 22.5% of the CGS – thus carrying costs are typically 4.5% of annual revenue. Thus, if an SME has annual revenue of $40M, the annual carrying cost savings expected from implementing an automated WMS with cycle-counting is $90,000 per annum.

Error Rates

1. Research suggests the longer it takes for inventory to transition from “Dock2Stock” and is in the “picking process”, the more it is exposed to shrinkage – both damage and theft (i.e. inventory on a pallet in the open can be run into by a forklift or exposed to theft). The lack of automation can also lead to errors in bin put-away and contribute to increased return rates/reverse logistics costs at the end of the distribution life cycle. Based on research and customer feedback, conservative estimates for savings derived from implementing scanning and automation is 2% of annual revenue.

2. Thus, using our previous example, if an SME has annual revenue of $40M, the annual distribution life cycle error rate reduction cost savings expected from implementing an automated WMS with scanning is $800,000 per annum.

Based on the analysis above, the aggregated **increase in EBITDA per year is $890,000.**

Increase in Labor Efficiency/Decrease in Labor Cost

As noted in the Executive Summary, decreased labor cost per revenue dollar from more fully automating the WMS process can be substantial. Components that comprise these savings include more efficient picking paths, minimizing movement between shelves/bins, maximizing orders shipped/day and allowing less staff to effectively pick the same number of orders. This increase in efficiency could also potentially drive more revenue with the same staffing levels. A quantifiable example of the ability to provide high service-levels while using less staff in WMS operations is as follows: using the same per annum revenue for the business ($40M) and the reasonable saving from automation cited in the Executive Summary (60%), if labor cost as a percentage of revenue is 35%, the company should conservatively be able to reduce overall operational expenses by 21% (60% of 35%). This would represent **annual saving of $8.4M.**

Reduction in Training Costs

A hybrid browser-based cloud/mobile app solution that is tightly coupled with a fully-functional horizontal ERP solution has been shown to reduce training costs for warehouse staff. NetScore customers have indicated their employees are trained on average 8 hours quicker based on ease-of-use and intuitive mobile apps. If the average staffing level for a company is 20 warehouse associates, the average annual turnover rate is 37% (industry average for SME Distributors) and the average hourly wage is $16.88 (industry average for SME Distributors), **annual saving of $2,998 are realistic.**

Reduction in Paper Costs

An automated WMS solution has been shown to virtually eliminate annual paper cost. NetScore customers have indicated if the average number of orders picked and received per annum is 200,000, the average number of documents per transaction is 8 and the cost per 8.5” X 11” sheet of paper is $.018, annual saving of $28,800 are attainable. A follow-on benefit is a substantial reduction in environmental impact as the 1.6M sheets of paper referenced above represent 160 standard sized pine trees that do not need to be harvested each year.

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Expected Savings: WMS with Zone/Wave Picking versus WMS-only

The areas of potential savings from an automated, tightly-integrated WMS solution with zone/wave picking differ slightly from those of a WMS-only solution. For simplicity, we will focus on direct quantitative savings that fall into two categories:

- **Decrease in Carrying Costs and Error Rates from Increased Efficiency**
- **Increase in Labor Efficiency/Decrease in Labor Cost**

Decrease in Carrying Costs and Error Rates from Increased Efficiency

The primary consideration for these cost savings is that they would be additive since the benefits of an automated WMS solution that is tightly coupled with fully-functional horizontal ERP would already have been realized. Quantifiable benefits experienced are as follows:

Carrying Costs

1. Based on research and customer feedback, conservative estimates for additional savings derived from implementing zone/wave-based automated cycle-counting is estimated at 2% of annual carrying costs.
2. The calculations are similar to implementing automated WMS with cycle-counting versus manual processes, but the improvement would be less for an SME moving to a zone/wave approach. The incremental annual carrying cost savings expected from transitioning to zone-based automated cycle-counting is $36,000 per annum.

Error Rates

1. These benefits are also incremental; however, the increased pick path efficiency would mean inventory is even less exposed to shrinkage. Based on research and customer feedback, conservative estimates for the incremental savings derived from implementing a zone/wave-based process is 1% of annual revenue.
2. Thus, using our previous example, if an SME has annual revenue of $40M, the incremental error rate savings expected from implementing a zone/wave-based process is $400,000 per year.

Based on the analysis above, the aggregated **incremental increase in EBITDA per year is $436,000.**

Increase in Labor Efficiency/Decrease in Labor Cost

As noted in the previous section, the primary consideration for these cost savings would also be additive since the benefits of an automated WMS solution that is tightly coupled with fully-functional horizontal ERP would already have been realized. However, picking paths would be even more efficient and highly optimized, maximizing orders shipped/day and allowing less staff to effectively pick the same number of orders. This increase in efficiency could also potentially drive even more revenue with the same staffing levels. Multiple research studies[2] suggest a 25% labor cost reduction/increase in efficiency is very reasonable (some suggest a 68% reduction/increase in efficiency). Using our previous example for the ability to provide high service-levels while using less staff in WMS operations: annual revenue for the business ($40M) and the reasonable saving from automation noted above (25%), if labor cost as a percentage of revenue is 35%, the company should conservatively be able to reduce overall operational expenses by 8.75% (25% of 35%). This would represent **annual saving of $3.5M.**

Conclusion

A tightly integrated cloud WMS solution has a very impressive internal rate of return (IRR). Transitioning a distribution operation from a manual process to an automated WMS solution based on the conservative savings/margin improvements outlined in this paper should immediately pay for itself in the form of:

- Decreased carrying costs and error rates
- Increased labor efficiency from reducing staff levels
- Reduced paper costs
- Reduced training costs
- The expected 3-year IRR is over 32,000% with a payback period of less than 4 days.

The expected additive financial benefits outlined above for deploying a zone/wave picking process should also provide immediate pay-back:

- Additional decreases in carrying costs and error rates
- Further increased labor efficiency from picking operations and/or reducing staff levels

The expected 3-year IRR is nearly 59,000% with a payback period of less than 2 days.

[2] *Wave Picking Explained: Strategy, Benefits and Best Practices By Red Stag Fulfillment | Updated on January 1, 2025. Wave Picking versus Batch Picking: Which is Best? By Ballon.*