We list below nine (9) reasons that companies are investing into Kiva Systems for their distribution operations:

1. Increased stocking and order picking productivity and rates.

a. There is no doubt that a goods-to-man system is faster than a man-to-goods environment. Quite simply, travel time associated with both restocking and order picking functions is eliminated. Travel time is typically 50 - 60% of the time spent picking orders in a traditional warehouse. In general, the larger the warehouse and the smaller the order size, the more travel that is required.

b. The productivity gains being reported by Kiva-run distribution operations are fairly consistent. The gains being reported from the field are in the 2X - 3X order of magnitude as compared to pick-to-conveyor operations; and 5X - 6X as compared to manual pick-to-cart or pick-to-pallet environments. Pick rates of 600+ order lines per hour are achievable in a pure picking environment based on the fact that a new pod can be presented to the operator approximately every 6 seconds; and that a pod can have multiple pick facings on it. This is the amount of time required for the operator to pick an item, place it into a carton or tote, and for the next queued pod to move into place to present the next pick facing.

c. To put this into perspective, the typical pick rate that we see in a conventional shelf bin warehouse environment, where operators are picking orders to carts, is about 100 lines/hour. We have seen some companies get clever with sophisticated order waving logic combined with intelligent cluster picking of multiple orders such that they achieve upwards of 180 lines per hour, but these operations are the exception rather than the rule. Thus it is conceivable that for every 6 pickers that one requires in a traditional warehouse, one would require between 1 - 3 pickers in a Kiva-run fulfillment center. Assuming a fully burdened salary of $30,000/year per associate, the labor savings of reducing 6 people down to 1 - 3 people is between $450,000 - $750,000 over 5 years.

d. Now there has been some bad press lately about robots replacing people and the hysteria associated with this concept. Kiva is not about replacing people with robots because we still need people to pick and pack orders no differently than in a traditional warehouse. This is all about making people more efficient combined with a better quality of life which has always been the goal since time immemorial. All distribution centers have an obligation to their customers to provide accurate and complete orders on time at the lowest possible cost to the customer. The reason we don't send people out to pick orders with carts that have square wheels is because it is inefficient and to this end, Kiva is no different than any other invention (such as the circular wheel) that helps to improve efficiency. d.

e. Depending on the technologies in place in a traditional warehouse, it is not always possible to identify with precision the exact productivity rates that operators are working at. With Kiva, the central computer system monitors the performance rate of each person at each work station in real time. The Kiva system enables management to understand productivity rates by operator with exact precision. Performance or training issues can be dealt with immediately.

2. Increased order accuracy, order fulfillment rates and speed of order turnaround time:

a. With any human-based picking system, the opportunity for human error is impossible to eliminate and this holds true for Kiva as well. Even the automated A-frame picking systems make mistakes from time to time so eliminating the human from the pick process doesn't necessarily guarantee the perfect order.

b. In any sophisticated distribution center operation where WMS technology is in place, there are many techniques that companies have used to minimize error rates. The use of radio frequency bar code scanners, pick to light systems, voice directed picking systems, in-line weigh scales, etc. are all common tools that we invested in to minimize human errors that take place in a distribution center. Even in the best operations, error rates can range between 1 - 3 units per 10,000 units picked with more typical error rates being in the range of 1 - 3 errors per 1,000 units picked. In distribution operations that are paper-based, accuracy rates are generally lower than this. To compensate, companies will build in a redundant detailed order checking process that adds cost to the operation.

c. Kiva enables the highest levels of perfect orders and customer satisfaction by way of its design which is in fact quite simple relative to today's technology capabilities.

I. When the pod arrives at the work station a laser light beam is pointed to the exact pick facing on the pod that the operator needs to pick. The only way that this could be the wrong pick facing is if the restocker erroneously placed an item into the pod to begin with. To prevent this type of error, the laser pointer is used to guide the restocking operator where to place the inventory within the pod.

II. The order selector picks the required quantity which is displayed on the pick to light display for each order requiring a product from the pod. If the light tells the operator to pick 3 and the operator picks 2 then a quantity error can be made. Weigh scales can be used to detect quantity mis-picks.

III. Customer testimonials thus far indicate that the error rates from the Kiva portion of their fulfillment centers are closing in on perfect. The fact that the operator works in a quiet, ergonomically designed work station where the computer does all of the thinking is why error rates are almost completely eliminated.

d. Order fulfillment rates, which are sometimes referred to as scratch rates, define the number of units not shipped out as a percentage of the total units shipped. In a non-automated distribution center, scratch rates can vary depending on the type of technologies in place to enhance inventory accuracy, but it is not unusual to have 1 - 3+ scratches per 1000 units shipped. Companies using Kiva's Fulfillment System are reporting scratch rates of .01% which is roughly 1 unit scratched per 10,000 units shipped.

e. Kiva is a continuous order fulfillment system which means that it can eliminate the need for order wave planning and release, order batching strategies, etc. In effect, orders can be released all day long in real time with no negative impact on labor efficiency. As such orders can be turned around without the delays inherent in an order wave planning environment.

f. In most distribution centers it takes at least 2 - 4 hours to for a product to be received and stocked before it can be picked for an outbound order. Kiva customers are reporting as little as 12 minutes of elapsed time between restocking and picking. This may not be a requirement for all customer orders, but for many companies this single benefit can provide an extremely valuable competitive advantage. Believe it or not, there are many distribution operations where a 30-minute order turnaround time is expected.

3. Inventory Accuracy and Security:

a. In a non-automated warehouse, you will find the vast majority of your inventory discrepancies if you focus on cycle counting the pick slots. Most mistakes are made during the picking process, so bin-level accuracy is generally much worse in pick slots than in slots used to store reserve inventory. Inventory accuracy figures vary depending on the type of product being handled within a given facility. For example, a warehouse that handles glass items will typically experience annual adjustments in the range of 1.5% (due to broken inventory that is found during the count) despite having a highly accurate operation. For most companies with a WMS, inventory levels approach world class when they reach 99.7% and higher.

b. With Kiva Systems, inventory errors are not eliminated completely because there is still a human interface and people can still pick the wrong quantity. Having said this, the inventory adjustment rates being reported from the field are so tiny that they are almost irrelevant. For example, the Staples Denver facility is reporting annual adjustments in the order of a few hundred dollars on sales that are in the millions of dollars.

c.We believe that it is safe to say that the level of inventory accuracy being achieved in Kiva operating environments is as close to perfect that one can get in an operating environment that involves people.

d. Lastly, a Kiva environment also offers more inventory security because the movement of inventory with high security requirements can be directed to specific work stations that are monitored. Also, humans never enter into the storage area where the pods are staged which reduces the probability of shrinkage.

4. Flexibility and Scalability:

a. Many high volume distributors use conveyor systems to reduce manpower for order picking. A conveyor system can enable batch picking of multiple orders concurrently which helps to significantly reduce travel time. Cross belt or tilt tray sorters can be used to automatically sort orders into discrete shipments. Investment cost is high but flexibility and scalability are low.

I. In most facilities, there are products that cannot be put onto the conveyor because their physical dimensions exceed the conveyor's capability. For example, if the conveyor can only accept cartons that are 18" long then any products that exceed this dimension cannot be picked to the conveyor system. There are also many products that are not conveyable because manufacturers are continuously seeking ways to reduce the costs of packaging materials. Think bagged per food as an example.

II. Conveyors are like highways that divide neighborhoods apart. They can cut off ease of access within a distribution center because they must ultimately transfer goods from storage and picking areas to a shipping dock. Good design will minimize this penalty by elevating the conveyors to allow vehicles to move underneath the conveyor system but this is not always possible in every facility.

III. Conveyors are expensive to pick up and move to a new building. Aside from the business disruption that is created in this scenario, it is not unusual to spend $1 Million to relocate a large conveyor system from one building to another.

IV. Conveyors are expensive to maintain over time. They require replacement parts and maintenance. Suffice to say that every 7 - 10 years one needs to budget for a large overhaul of the equipment which can cost 20 - 25% of the original cost of the system.

V. Once a conveyor system is designed and installed, it is not something that is intended to be modified unless this was done by design up front.

VI. These points serve to illustrate that despite their benefits, conveyors rank low in terms of flexibility and scalability.

b. Kiva Systems is appealing to Internet retailers because of the fact that the solution is both flexible and scalable, and this remains one of its strongest selling points. For most Internet retailers, growth rates are a wild card. If one had to generalize, Internet retailer growth rates tend to exceed expectations, which is why Kiva Systems provides a strong fit for their supporting distribution center operations.

I. It is a relatively quick exercise (e.g. 6 weeks) for a distributor to expand the storage street grid; to add more work stations; and to add more pods or robots. The central computer system is simply updated with information about the expanded environment and throughput capacity is increased with little or no effort.

II. Similarly, if a company needs to move its operation to a new facility, the cost and complexity of moving the operation is minimal. The new street grid and wireless network can be implemented in the new facility so that the operation is moved over a weekend. No conveyor system to dismantle and reinstall at huge expense, no wires to be embedded into the concrete floors, no infrastructure that needs to be deployed. No headaches pure and simple.

III. Kiva does not impose constraints around product sizes or formats in the same way that a conveyor system does. The Kiva System can move pods and pallets of up to 3,000 pounds (ed. note - the weight limitation is one of the few constraining factors with the current technology). Product packaging formats are a non-issue. Companies are using the Kiva system to handle flat and hanging apparel, along with a wide variety of different product types come in brown boxes.

5. Electricity Savings:

a. One of the unforeseen benefits of Kiva is its reduced electricity consumption which can be a significant figure when one considers the cost of powering an extensive conveyor system. Kiva robots require 5-minute battery charges every couple of hours, but unlike humans, robots do not need bright lights to perform picking operations. The area where the Kiva robots operate within can be nearly lights out because no humans are intended to work in this area.

6. Quality of Life:

a. In our experience, there is a wide variance in how companies think about this subject. In a distribution center, quality of life can be characterized in a number of different ways:

I. Safety - the probability that an operator may experience bodily harm because they are working in an industrial environment where man and machine are working together in the same space. With Kiva, the human machine interface is safe because the area that the robots work within is off limit to the operators.

II. Ergonomics - the amount of bending and stretching that a person must do to perform their job. As people get older, this excessive bending and stretching can lead to injuries that ultimately result in higher rates of workman's compensation expense. In traditional warehouse operations there are ways that we can improve ergonomics, but there is no escaping the fact that order picking is a job that involves heavy lifting, reaching, bending and stretching all day long. Kiva improves upon this by eliminating travel fatigue factor and by designing an ergonomic work station.

III. Noise level and cleanliness - distribution centers that are equipped with high volume conveyor systems tend to have the highest noise levels. Without the use of proper ear protection, operators that are exposed to loud conveyor systems for many years will ultimately suffer significant hearing loss over time. Kiva is as close to a clean and silent operation as can be found anywhere on the planet.

IV. Fatigue factor - in a large Amazon.com fulfillment center, it is not unheard of for an order picker to walk over 20 miles per day on concrete floors and mezzanines. In smaller distribution centers where pick to belt systems are installed, many operators walk 3 - 5 miles over the course of a shift. In the Kiva system, the operator can work on comfortable mats in a 6' x 6' work station to ease of the discomfort of standing all day. Personally I think every distribution executive should spend at least one day per year picking orders in the warehouse to understand the value of this point alone. Walking on concrete for 8 hours is physically demanding work and at the end of the day your feet and legs are tired, especially if you are 50 or older.

7. Reduced Training Time

a. In many traditional distribution centers, a new associate is trained by an experienced associate and the expectation is that the new associate should be up and running within a 2 - 3 week time period. In distribution operations with engineered labor standards, the ability to reach the expected production standard can often require 6 weeks or more.

b. Companies using the Kiva Fulfillment System are reporting training times in the order of 2 - 3 days. This is because the operator does not need to learn a warehouse numbering system, the aisles where goods are stored, etc. They simply need to stand at a work station and look at the lights that tell them what to do. The work station is designed to remove the thinking element of the job, and to replace activity with productivity. Therein lies the reason why people are up and running in a few days. This is an especially important benefit to Internet retailers where they need to scale their operation quickly, by adding new people, to meet the needs of peak season.

8. No downtime and built-in redundancy:

a. The worst nightmare of a distribution manager is the day during peak season when the conveyor system goes down. I'll never forget a tour that I was on some 20 years ago where the Director of Operations was explaining how 90% of the annual volume goes out the door in the month of November which happened to be when we were visiting the facility. Just as he finished his sentence the entire conveyor system shut down and all 400 people in the operation suddenly stopped working. You could have heard a pin drop. With a conveyor system, when something goes down, you don't ship orders.

b. An alternative goods-to-man technology is the horizontal carousel. With this equipment, goods are stored in pods of carousels that bring the inventory to the operator. While the person picks from one pod, the other pods are spinning to bring the next pick facing forward. The carousel is an example of a serial technology because only one person can work at the picking function at any given point in time in the typical setup. The carousel can only output a certain throughput per shift based on the picking rate of the order selector. For example, if the picker works at 300 lines per hour then the carousel work station can only output 2,400 order lines per shift. The carousel also needs to be replenished so there is a downtime required at some time during the day to restock the carousel pods.

c. With the Kiva System, the design is based on parallel processing rather than serial processing. Thus if at any time an operator at a work station needs to stop working, then the other work stations can continue processing orders. If at any time a robot goes down, then another redundant robot is there to take its place. Restocking the shelves takes place concurrently with picking operations and there is never any system shutdown required to enable restocking. At no time does the entire system go down which eliminates the high degree of risk that is associated with other mechanized or automated systems where there is a single point of failure that can prevent orders from being shipped.

9. The 'Wow' Factor

a. There is no denying it, watching the orange robots doing their job ranks high in what we call the 'wow factor'. While we don't want to dwell too long on this topic, suffice to say that one can never underestimate the marketing power that a solution like this brings to the table.

b. For one publicly traded retailer, their stock price received a boost because analysts pointed out the efficiency benefits associated with their deployment of Kiva.

c. For any 3PL logistics service provider, the use of Kiva Systems is a strong selling point that provides a leg up over the competition. This is particularly true in the apparel and footwear industry.

d. For any distributor seeking to increase market share by making a favorable impression on customers, deploying a Kiva Systems operation provides a showcase distribution environment that is sure to instill confidence.