An Eventchain Case Study

Creating value:
Not a zero sum game

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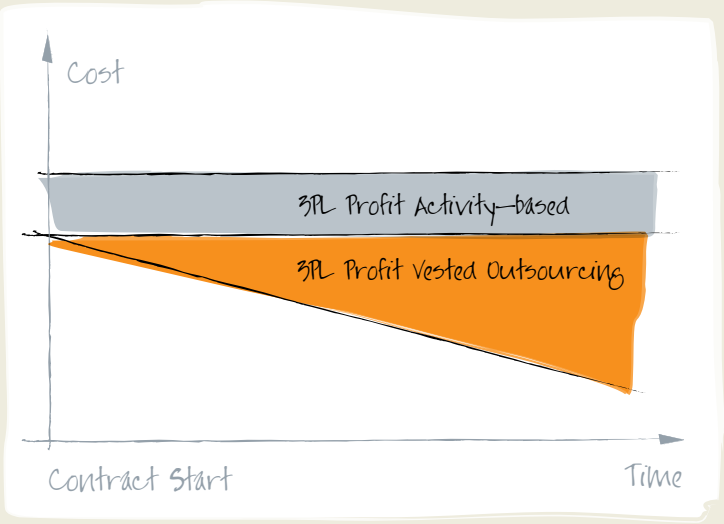
Part One	The Case	3
Part Two	The Case Study	8
Part Three	Appendix A	15
	Appendix B	24
	Appendix C	25

Part One

The Case

Kate drew three lines on a graph and said, "This is what I need."

"The horizontal axis represents time and the vertical axis the cost of the operation. The two lines in the first quadrant represent cost and revenue for a typical activity based outsourcing contract.



In a typical outsourcing contract, the outsource provider (3PL) prices the operation at current cost plus a fixed margin and distributes this figure across the activities to be performed. Obviously, in this arrangement – an activity-based contract – there is no contractual incentive for the 3PL to improve performance or reduce expenses.

This, we can graph. We have lots of real-world evidence for this.

But what I want to demonstrate is the performance, over time, of a Vested Outsourcing model.

Here's an example of how a Vested Outsourcing contract works:

- The revenue for the 3PL is fixed over time to the operational costs at the start of the contract.
- The 3PL therefore must create value – and has a strong incentive to do so - by making operational changes and improvements that will bring down the cost of the operation and increase profit.
- The outsourcer may also offer additional revenue or bonus payments for improvements in service levels and inventory turns – and, at the same time, profits from enhanced service and inventory turns.

In this model, everybody wins. The 3PL has the opportunity to significantly improve margins over time. At the same time, the outsourcing party profits through improved service levels and improved inventory turns. The value of incremental improvements in inventory turns has the potential to far outweigh gains in logistics costs.

Right now, for the most part, the Vested Outsourcing model is a theory. In order to shift behavior and restructure our contracting activity away from activity-based contracts, we need to validate that theory. I want to be able to demonstrate that productivity will increase, costs decrease, and that both parties generate more profit with Vested Outsourcing. In short, I want evidence. I want a graph.

Can you do that?

Can Eventchain systems model the baseline and the prospective changes and measure the results? Can your platform test and validate – *and graph* – the tangible results of our theoretical projections?"

Vested Outsourcing evolved from a University of Tennessee program funded by the US Air Force to study companies employing performance-based (rather than activity-based) approaches for outsourcing.

Vested Outsourcing is a contract model challenging outsource providers to apply insight and capital to create value so that both buyers (outsourcers) and sellers (third party logistics providers or 3PLs) win. It focuses on rewarding clearly defined, measurable outcomes rather than the number of transactions executed. Emphasis is put on insight rather than contractual oversight.

Although the principles of Vested Outsourcing appeal to supply chain and logistics executives, the existing approach – activity-based contracts – is the way we do business now. It is familiar, understood, and entrenched.

Vested Outsourcing requires 3PLs to show more insight with less oversight. In a sense, "hands off" is the new mode of interaction. Outsourcers provide incentives to providers to innovate and reduce costs – and then they have to sit back and let providers do exactly that.

Naturally, the prospect of losing a tight grip on the operations of the outsource provider is daunting to an outsourcer. In order to shift the way outsourcers and supply chains executives think and operate – indeed, to shift the current paradigm - Kate needs compelling, convincing, and reassuring evidence.

But how do you prove an unproven approach? How do you prove that changing the way you structure a contract will change – for the better, for all parties and their bottom lines – the way you do business, when very few are doing business like that, yet?

Kate didn't really need a graph. She needed proof.

It was my second visit to Seattle after moving to Vancouver in August 2009 to market our logistics operational cloning product – a product which developed out of our own reflections on exactly the kind of behavior Kate wanted to shift.

Like Kate, we had noticed that when negotiating pricing and activity-based outsourcing contracts, 3PL providers and their customers play a cat-and-mouse game. Activity based contracts are complex and profitability depends on the pricing of the individual contract elements and how they relate to the underlying operations and the flow-through of inventory.

So the seed for our cloning product were planted in early 2008.

Our vision was to create a platform that would provide a cloned operation mirroring the actual operation but where time is accelerated to allow the outsourcer or the 3PL to experiment with the pricing model to their benefit. In effect, we were creating software to see into the future.

That's a pretty theoretical way to explain what our software does, and can do.

Here's another way to think about it:

We create a virtual world, model the business executive into an avatar, and send him off on an adventure.

What happens if he restructures his team? Redesigns his warehouse? Implements a new purchasing strategy?

Can he become more productive and profitable at the same time? Can he? Will he? What will our hero do?

And, just to be safe – because we're cautious, rational, evidence-based business types, after all – we clone our hero and his world so we can compare what happens if he does redesign his warehouse with what happens if he does nothing. We can compare the costs of a change – like say, moving to a new location – with the cost-savings of improved efficiency because of that move, and then we compare all of that with no change at all.

Is it worth it? Should the change be implemented abruptly or phased in over time? Does the short-term pain of change result in a long-term net cost-savings and an increase in productivity? Or would doing the same ol' same ol' be a wiser choice?

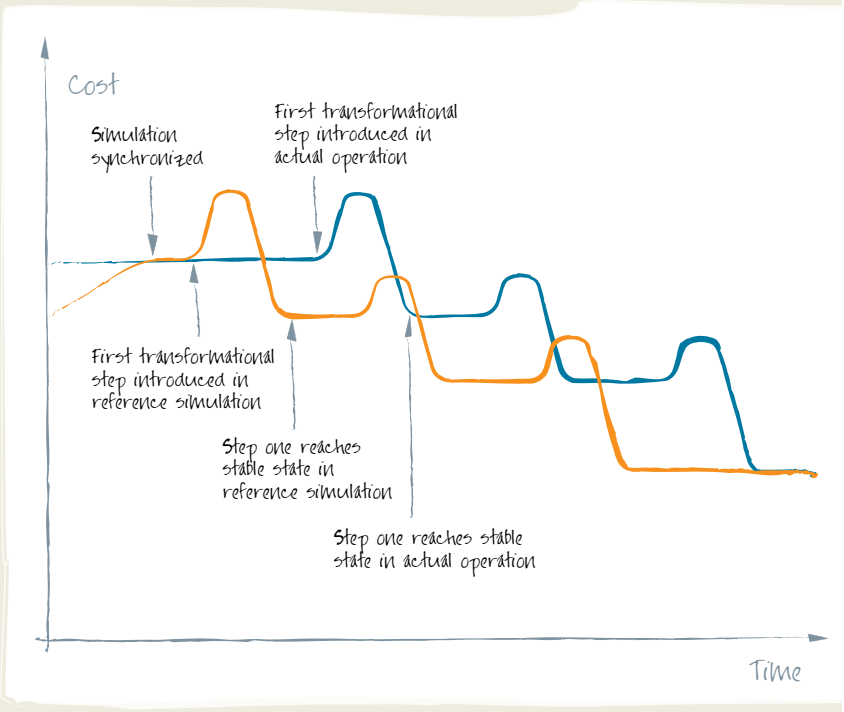
It is like a middle-school choose-your-adventure book meets video game for logistics executives. Or seeing into the future.

And we can graph the evidence.

Here's how we do it.

If change-management is like an epic film – in which you think you know the outcome, but you have to sit through the entire thing to be sure – then Eventchain systems is the business equivalent of a prequel. You find out the ending before beginning your journey. You then apply your insights to implement profitable changes in your real-world business. Our software creates a virtual business reality that allows you to scope, simulate and implement effective supply chain decisions in six steps.

1. *Model.* The cloning process starts with the profiling of the actual logistics operation or network. This profile is used to establish the reference clone that represents the actual operation. This reference clone is then fine-tuned to synchronize it with the actual operation.
2. *Scope.* We map out the prospective changes into discrete projects. Changes that may improve the operation are identified and grouped into transformational steps.
3. *Simulate.* To test the prospective changes, we create additional clones that will each, individually, test the decision points and paths. Temporary clones are spun-off from the reference clone and transformation steps (packages of change) are applied to these temporary copies of the reference clone.



4. *Evaluate.* Once the steps have been combined in the form of a transformation program, the first transformational step is applied to the reference clone. Once the change has stabilized, the expected ROI of the change can be measured. In essence, we simulate changes and measure the outcomes, calculate the cost of change versus the net gain of change, and compare all of these data points to the other clones and our baseline organization.
5. *Implement.* If the business case still holds, it is implemented in the actual operation and the result measured against what is expected.
6. *Repeat.*

Lather, Rinse, Repeat. Model, scope, simulate, evaluate, implement, repeat.

Make your mistakes in the virtual world, not in your business. Test your assumptions before you implement changes so that you can implement them with confidence, accelerate the rate of change, and continuously create value and therefore profit. Get it right before you start.

As our software development progressed, it became clear that the original value we envisioned was only the tip of the iceberg.

Right now, in the real business world, change that reduces operational costs is often massively slowed down – or not implemented at all – because logistics and supply chain managers are unable to predict consequences with any high degree of certainty.

This, combined with the actual hurdle of managing the change, constructs a significant barrier to the process of continuous improvement.

Eventchain's software – a cloned operation platform – changes that, entirely.

It allows logistics practitioners and consultants to experiment and validate the outcome of intended transformation steps. It provides an environment where ideas will be test-driven to explore their potential value. It untangles the complexity of decision-making by clearly showing the dependencies between potential changes and even provides a way to anticipate the optimum sequencing of change projects.

We aren't simply creating software to evaluate prospective changes – we're creating certainty.

Eventchain systems is software that provides foresight through simulated hindsight.

We started to get really excited.

It was good timing and a great fit.

At the time of our meeting with Kate, we had generated significant interest in our software, but needed a way to translate interest and opportunities into sales. It was clear to supply chain and logistics executives that our tool had potential, but we needed to demonstrate the tangible results our platform could provide. We needed a case study.

Kate needed a way to see into the future and validate the value of her outsourcing model.

Using the operational cloning process to demonstrate the value of Vested Outsourcing met both our needs.

We agreed that we would profile a chosen operation and establish an operational clone. Then we would parallel two outsourcing scenarios, the first an activity-based contract and the second a performance based contract and compare the financial performance.

Kate would have her graph and we would have our case study.

Part 2

The Case Study

The backstory

Our first step was to select an operation to profile in the case study.

We wanted the case study to demonstrate Vested Outsourcing and contain scenarios familiar to most supply chain and logistics professionals, so we chose choose a medium-sized distribution operation with limited automated material handling equipment (such as carousels). Fortunately, we were intimately familiar with this kind of enterprise and could disguise and adapt a real, medium-sized distribution operation. (The details of the warehouse profile are in Appendix A.)

The setting

We then constructed two hypothetical outsourcing contract scenarios.

In both contracts, the Outsourcer

- bears the cost of integrating the 3PL warehouse management system (WMS) with the outsourcer's enterprise resource planning (ERP) system
- Owns the racking and the wireless network already installed – but makes them available for use by the 3PL

In both contracts, the 3PL inherits the warehouse lease and staff.

Activity Based Contract

In the activity based contract, the 3PL charges for discrete activities and storage and prices the activities so that an anticipated margin of 10% will be realized (see Appendix B).

Vested Outsourcing Contract

With Vested Outsourcing, the Outsourcer

- pays the 3PL a fixed monthly fee equal to the starting cost for an agreed service-level. (See Appendix C for the cost model)
- rewards the 3PL for the value created by improvements to inventory turns while maintaining service levels.

The cast

Before we get too much further, let's define our roles and resources.

You: the 3PL who has agreed to the vested outsourcing model and is now incentivized to reduce cost below the starting operating cost (the profit in the contract).

Eventchain: works with you, the 3PL, using our operational cloning process models to predict and assess change processes and outcomes.

The plot

We start – where else? – at the beginning. The warehouse hand-over has taken place and the system integration between the 3PL WMS and the outsourcer is complete and bedded in.

Now you want – and need - insight and potentially available capital to achieve operational cost gains. Value-creating change is crucial to the profitability of the operation. In order to make those changes – rapidly, confidently, effectively – you need to be able to predict which changes will increase inventory turns and profitability.

Eventchain's operational cloning process models and measures potential changes.

Perfect! That's just what you need: the ability to see into the future, fast.

So you sign an agreement. Eventchain will recover costs on a monthly basis, offset against 8% of the value generated in the first year. Just as you have a vested interest in reducing costs and therefore increasing profits, Eventchain has a vested interest in making sure that happens.

Getting started

A month before the contractual hand-over, you provide Eventchain with the warehouse profiling data in the format requested.

Within two weeks, using the profiling data you provided, Eventchain constructs the reference operation ("reference clone").

Once the reference clone is established, it is monitored to ensure that it mirrors the metrics and KPIs of the profiled operation. This takes two days.

You and Eventchain then proceed to jointly study the operation and identify potential areas for improvement.

Pre-change
Assessing the terrain, reassigning staff

Accounting in a vested outsourcing contract is simple: it is fixed per month and does not require checking and verification. This means the 3PL billing clerk can be reassigned, creating our first cost-saving/efficiency win.

Next, we take a look at operational resource consumption in the warehouse. Replenishment and picking combined consumes approximately 63% of the floor staff resources in the warehouse.

We'll start there and focus our analysis and possible changes on these two processes.

A simple supervisory method is in place. Staff functions are grouped into silos: operational staff perform specific roles such as receiving, put-away, and replenishment. Product is slotted in the pick-face shelving and replenishment lots are set to carton quantity multiples. The slotting sequence is strictly ordered according to SKU velocity.

What's wrong, exactly, with the existing replenishment system in the warehouse?

Once Eventchain began analyzing the operation, we noticed a few areas for improvement:

- studying SKU velocity revealed that high-velocity inventory is poorly placed, driving up the travel required by replenishment resources.
- The SKU velocity profile also shows that reorganizing the pickface may reduce the number of replenishments required.
- purchase order frequency was set to the supply lead-time of the SKUs. This was done for the most part to reduce the number of smaller shipments and avoid potentially higher freight forwarding costs for international shipments.

We quickly realize that we have enough to define a program of transformation.

Project: Change
Mapping (and simulating) it out

After analyzing potential changes, we group them into specific transformation steps to be managed as projects and define a rough heuristics-based cost benefit analysis for each. This means each change package includes an individual project appraisal or business case and pre-defined assumptions about costs and benefits.

We keep our baseline reference clone and proceed to create two new versions of it for each proposed change package. Each transformational step requires two separate simulations: one to investigate the impact of an abrupt engineered change and another to measure the time for eventual convergence to a stable state. Each change is applied to a copy of the operational clone so that an accurate ROI can be projected.

The visualization of the simulations allows you to time-travel by fast-forwarding, pausing and rewinding the virtual business world created by Eventchain. Once the individual steps have been simulated and validated, then the program of transformation is finalized and the "in real life" implementation begins.

Change 1
Inventory placement

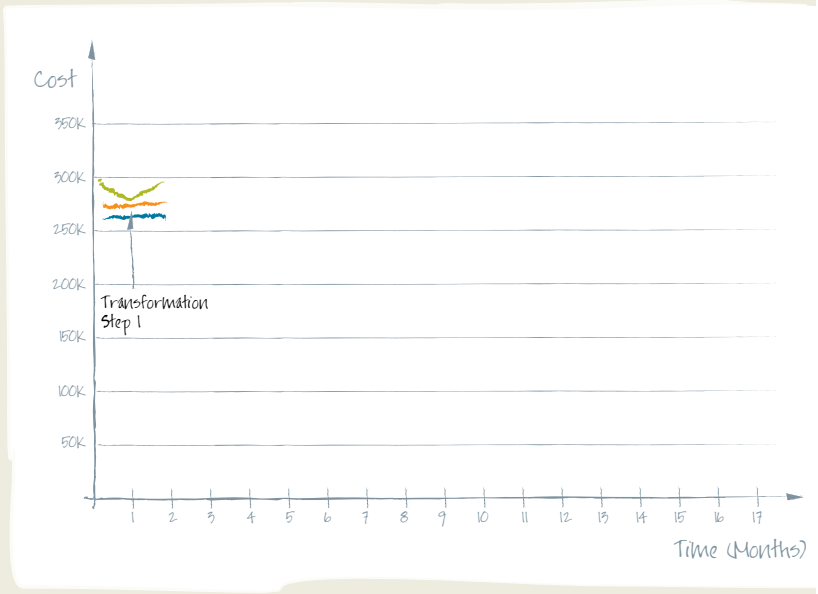
Addressing the inventory placement issue was an easy place to start. We'd already figured out that high-velocity inventory is poorly placed, which means extra travel-time for warehouse staff. Finding the fix was simple: all we needed to do was make a minor reconfiguration of the WMS to consider the SKU ABC classification when determining the warehouse zone to place the inventory during put-away.

By implementing this change, we expected the travel expended during replenishment and pallet picking to reduce and the distance travelled during put-away to increase. After the rule change was implemented, and once the inventory placement stabilized, the difference would be a net benefit.

We used a heuristics-based calculation to show that the potential reduction in effort will be 1.2 FTE or about 52k annually in staff and equipment costs.

From there, we want to know if emptying the warehouse and re-stocking it according to new put-away rules is more effective than a slower, more gradual convergence.

We introduced the change into a branched version of the reference operational. The result did not show the expected FTE reduction of 1.2. It did of course, over time, result in an alignment of SKU ABC classification with zone.



As this change required a very minor reconfiguration of the WMS configuration we decide to go ahead with this transformation step.

The results at the end of month two? If you're looking for short-term gains rather than long-term (and significant) profit, you might not be happy.

Two months in, the activity-based contract has a made a profit of $48,882. The Vested Outsourcing contract lost $21,640.

But we're not finished, yet.

Change 2
Slotting and zoning

We now turned our attention to slotting and zoning.

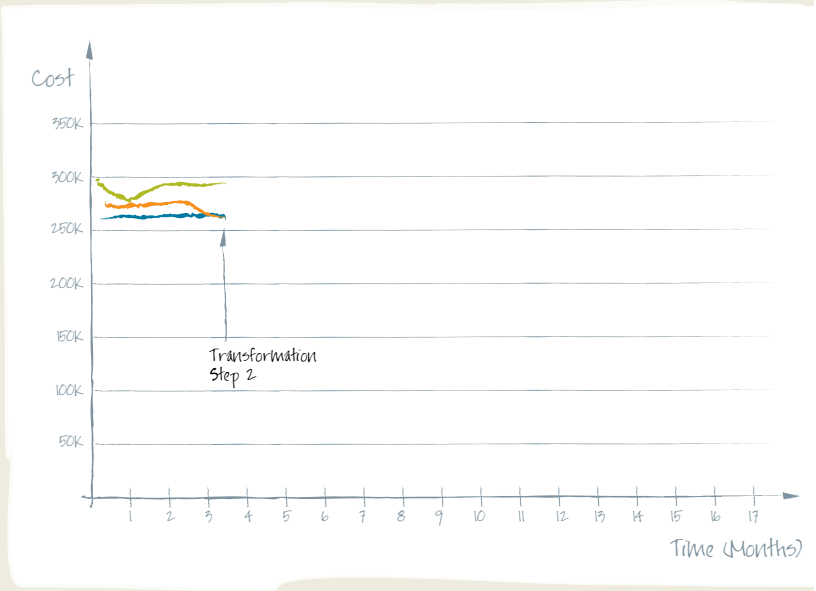
First, we analyzed the impact of including floor level pallet bays in our pick-face, slotting the fast movers there and increasing the replenishment lots to full pallets. At the same time, we allocate more carton space to the remainder of the SKU's.

We anticipate this will both increase the space available directly above the slotted SKU and increase the chance of direct put-away to the pick face. Together, these adjustments will reduce the number of required replenishments.

To reduce the level of congestion between replenishment, put-away and picking activities we would allocate replenishment and put-away activities to an earlier shift.

A heuristics-based calculation shows that once the inventory position has stabilized the potential reduction in effort will be 6 FTEs or equivalent of about 312k annually in staff and equipment costs. The effort to complete a reshuffle of the warehouse is approximately 14k (334 hrs) and can potentially be done over a weekend.

Once we had defined the design of this transformation step, we introduced the changes into another branched version of the reference operational clone. This showed that only a reduction of 4FTEs can be achieved without impact to agreed service levels.



With our simulations complete, and our confidence intact, we decide to go ahead with the change, which takes place three months after the formal 3PL handover and stabilizes after another month.

After seven months of operation, the activity-based contract has a made a profit of $171,089, while the Vested Outsourcing contract has lost $8,670.

These are still not terribly promising results, but we're vested in producing long-term value rather than attractive short-term reports. And so we carry on.

Change 3
Reduce space, convert into a shared facility

Next, we decide to explore opportunities to reduce the space required in the warehouse as a result of reduced inventory. This can potentially allow us to turn the warehouse into shared facility and would increase warehouse inventory turns and trigger a bonus payment from our customer.

Since we're handling the freight forwarding for our customer, we start by analyzing current shipments and investigating the effect of ordering smaller quantities more often.

In order to be able to continue offering the same container rates, we consolidate the freight in our depots in China, which will mean a minor increase in domestic delivery costs to deliver the freight from factory to depot.

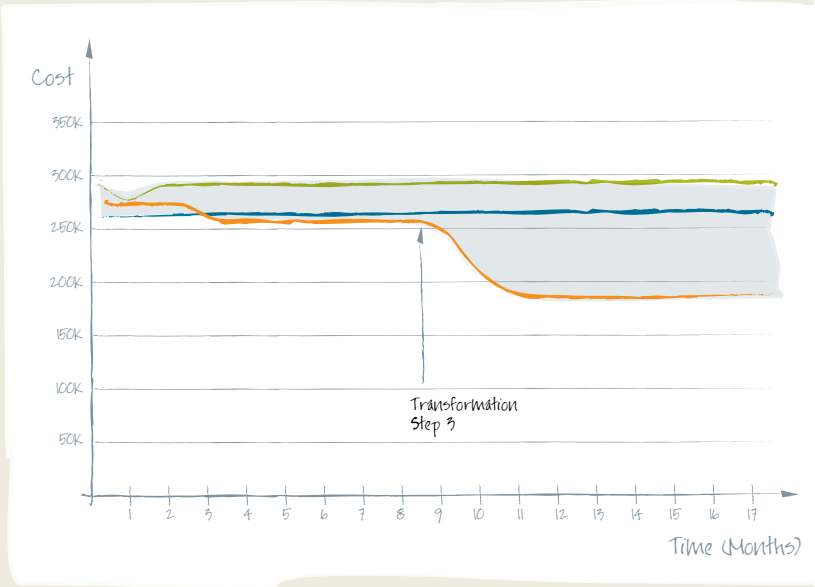
We now simulate the effect of the increased order frequency and reduced safety stock.

According to our branched clone, this change will result in an increased receiving and putaway FTE requirement of 2 and reduced replenishment FTE requirement of 1. This means a net increase of 1FTE.

The warehouse space requirement reduces by 52%.

This is a promising path. We share our findings with our customer and make a plan to change the process and implement with the help of their purchasing department.

This change takes three months to implement and commences nine months from the handover, and effects become apparent approximately 10 weeks later.



The most important result of this change is that the increase in inventory turns frees up approximately 3,6 million in working capital for our customer.

This, in turn, generates a bonus payment of $12,000 per month.

Eighteen months into operation, the activity-based contract has made a profit of $439,944. The Vested Outsourcing contract, on the other hand has generated a profit of $613,036.

Now we're seeing value.

Results

Assuming the contract runs for three years, an activity-based contract would have yielded the 3PL a profit of $879,888.

The Vested Outsourcing contract, on the other hand, would have created profit of $1,995,220 for the 3PL - almost double the profit of the first scenario.

In addition, in the Vested Outsourcing scenario, the customer's outsourced logistics cost is $879,888 less than the activity- based scenario. Vested Outsourcing also frees up approximately $3,600,000 of working capital.

Kate got her graph.

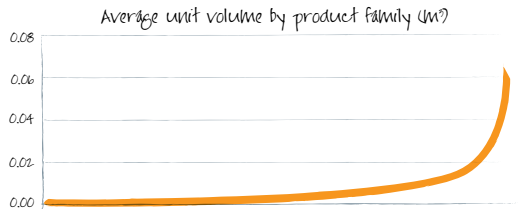
Part 3

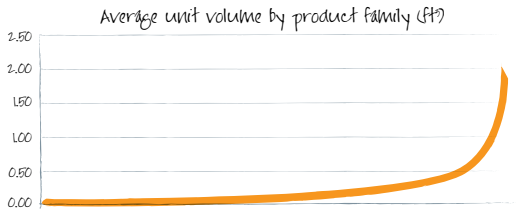
Appendix A

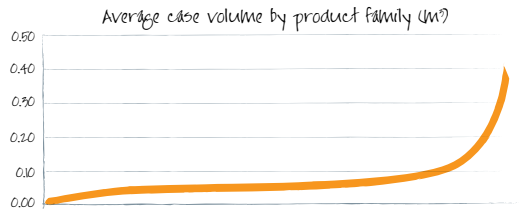
SKU profile

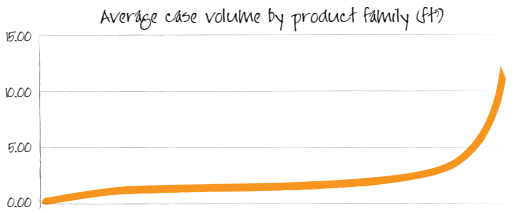
The profiled warehouse holds 937 SKUs with 136 different product families. The inventory is imported with an average lead time of ten weeks and a supplier base of twelve vendors primarily located in China. The purchasing frequency is on average two months.

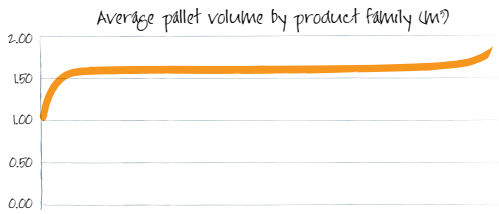
Average unit volume	0.01 (m^3)	0.23 (ft^3)
Average case volume	0.08 (m^3)	2.82 (ft^3)
Average pallet volume	1.62 (m^3)	57.29 (ft^3)
Average unit weight	1.07 (kg)	2.36 (lbs)
Average case weight	15.21 (kg)	33.46 (lbs)
Average pallet weight	440.38 (kg)	968.83 (lbs)
Average units shipped per month	680,000	
Average unit sale price (USD)	175.51	

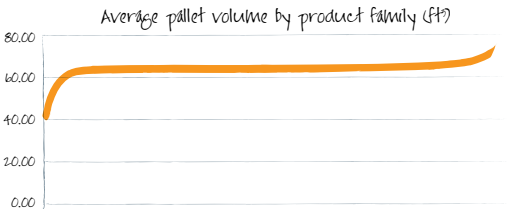


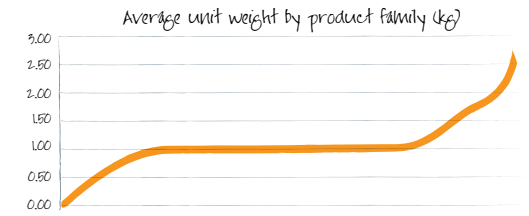


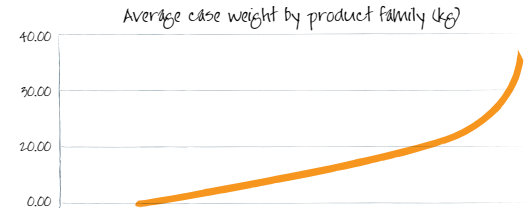


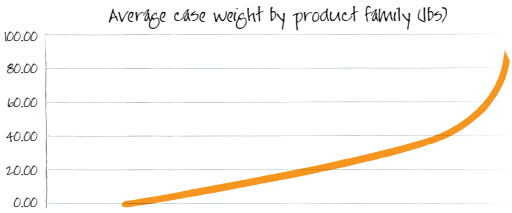


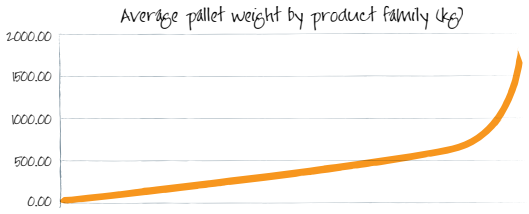












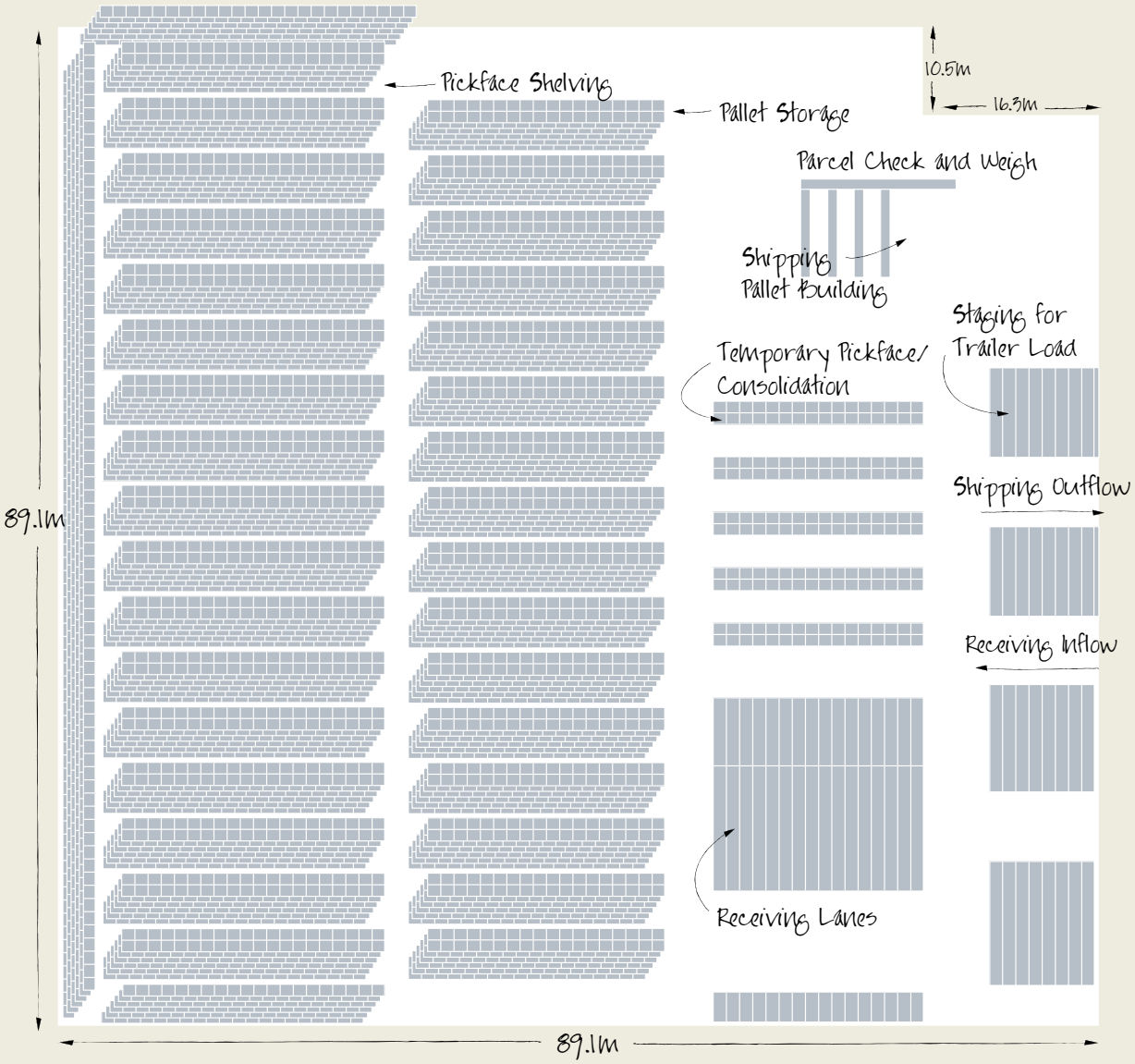
Sales order profile

- Average number of orders per month: 1,300
- Average number of order lines per month: 49,000
- Average volume shipped per month: 3,500 m^3

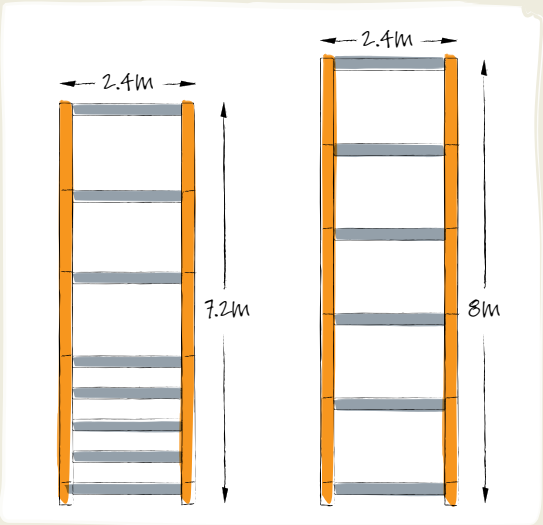
Warehouse physical design

The warehouse floor area is 7,770m² (83,628 ft²) with an available operational volume of 77,700 m³ (2,742,810 ft³)

The warehouse has three trailer doors, one primarily used for receiving inflow and two for primarily used for shipping outflow. The receiving, temporary pick-face, shipping pallet-build and trailer load staging areas are block stacked, floor-level storage. The parcel check and weigh area is an un-motorized conveyer with electronically integrated scales.

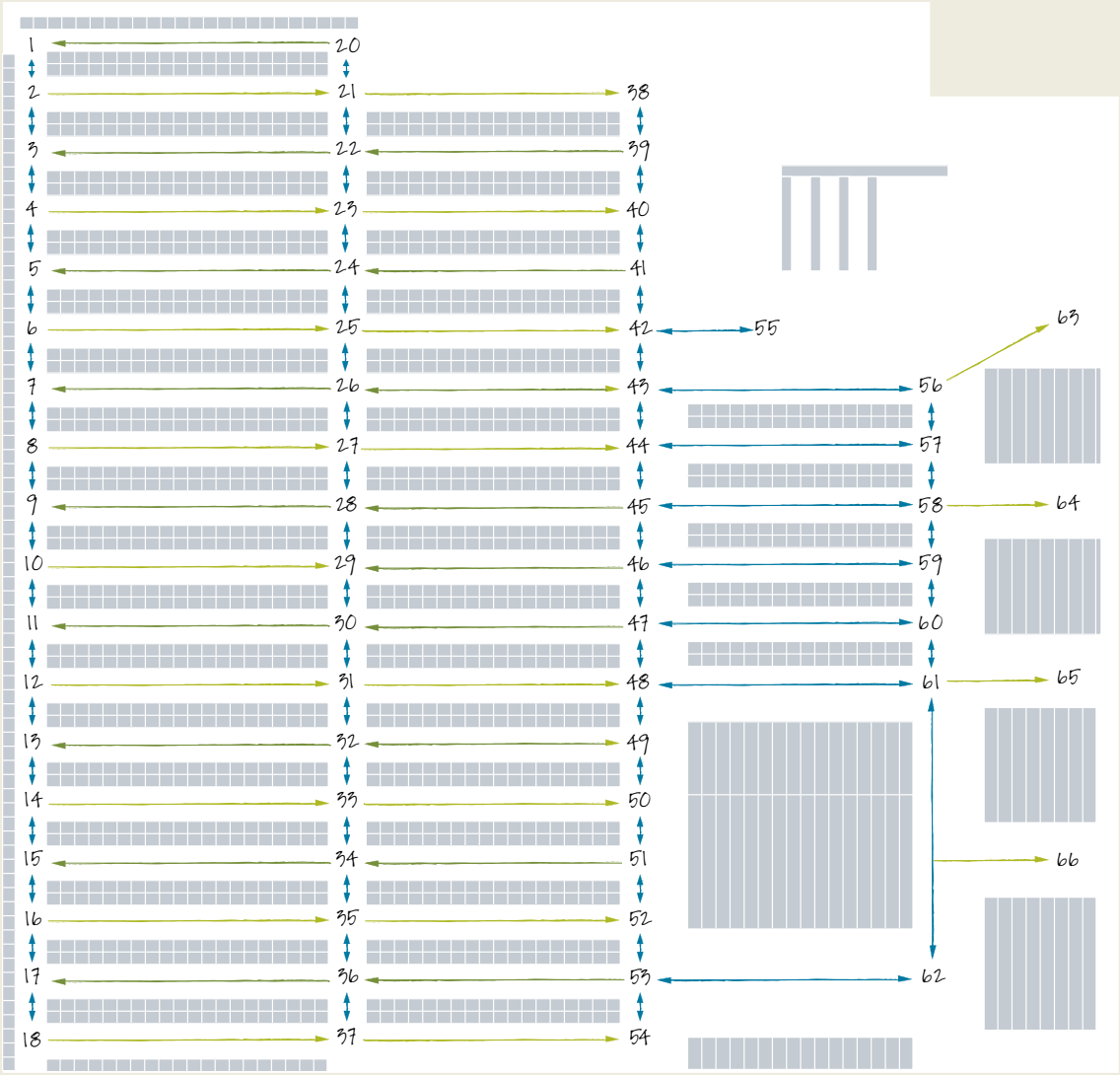


Two racking configurations exist in the warehouse. The fast-pick area has 4 layers of pick-face shelving at the bottom directly accessible to warehouse staff on foot. Above the pick-face shelving there is four levels of pallet racking. The remainder consists of six levels of pallet racking.



Storage/Processing Type	Sizes (m^3)	Sizes (ft^3)	Number	Available volume (m^3)	Available volume (ft^3)	% of available volume
Receiving	18.432/36.864		24/32	1622.016	57257.1648	2.09%
Selective pallet racking	2.304	81.3312	7392	17031.168	601200.2304	21.92%
Pickface shelving	0.288	10.1664	5040	1451.52	51238.656	1.87%
Temporary pickface	2.304	81.3312	160	368.64	13012.992	0.47%
Staging for trailer load	18.432	650.6496	24	442.368	15615.5904	0.57%

The traffic flow through the racked area of the warehouse has been designed the follow unidirectional traffic flow through the aisles.



Warehouse organization

The warehouse operation employs 36 people. The organization consists of:

- Warehouse and inventory manager (1)
  - Supervisors (2)
    - Receiving and Shipping clerk (1)
    - Unload, receiving and put-away operational staff (4)
    - Replenishment (4), picking (15) and cycle counting operational staff (1)
    - Packing, check and weigh station operational staff (4)
    - Shipping pallet build and trailer load operational staff (2)
  - 3PL billing clerk (1)
  - Customer service coordinator (1)

Warehouse equipment

Material handling equipment includes:

- Counterbalanced lift trucks 2000 kg/4000 lbs (4)
- Reach trucks 2000 kg/4000 lbs 8m reach (2)
- Mid/high-level order pickers (4)
- Picking trolleys (17)
- Hand pallet trucks (3)

Warehouse inventory carry media

Inventory is received stored and shipped on pallets. Unit picking is done directly into shipping cartons where pick quantities are less than carton quantity.

Warehouse processes and systems

The 3PL makes use of a software-as-a-service warehouse management system that provides radio frequency device barcode scanning driven processes.

Expected inventory are created as purchase orders in the WMS via the ERP interface. Purchased inventory arrive in 20 and 40 ft container loads. The inventory arrives palletized and labeled. Pallets may contain mixed SKUs where order quantities are less than full pallets. The inventory is unloaded and staged in an assigned receiving lane in the warehouse. Receiving staff receives the inventory via an RF device. Once a receiving lane of inventory has been systemically received, the inventory becomes available for put-away. Put-away operational staff draws from a pool of counter-balanced and reach trucks to place the inventory in storage. RF scanning confirms both pick-up and placements real-time.

Replenishment staff using order-pickers, replenish the pick-face as needed on a continuous basis. RF scanning confirms both pick-up and placements real-time.

Sales orders are created in the WMS via the ERP interface. Orders are grouped, allocated and activated by the WMS. Orders are picked and staged for check and weigh once the picking trolley if full. Packing operations staff uses an electronically integrated weigh-scales to weigh the packed carton, prints a shipping label and packlist that accompanies the carton. The last carton scanned, triggers a physical invoice print. Shipping staff consolidates orders due for the same destination on shipping pallets. Pallets that are complete are then staged in trailer load lanes. These are loaded on the carrier vehicles when they arrive.

The start-up operational put-away rules configured in the WMS are:

1. Attempt to cross-dock opportunistically
2. If not possible, attempt to place inventory in the bay closest to the slotted pick-face location
3. If not possible, attempt to place inventory in zone B,C or D in a location closest to the user doing the put-away
4. If not possible, attempt to place inventory in a reserve location closest to the user anywhere in the warehouse

The start-up operational replenishment rules configured in the WMS are:

1. Attempt to replenishment from locations with the best handling unit fit, followed by earliest storage date(FIFO) and followed by location closest to pick slot

The start-up operational pick wave rules configured in the WMS are:

1. Consolidate orders due, based on Ship-to, carrier and order type
2. Soft allocate and order pick
3. Back schedule based order due date

The start-up operational picking rules configured in the WMS are:

1. Attempt to pick from the pick-face, prefer picks with the best handling unit fit, followed by location clean-up, followed by earliest storage date(FIFO) and followed by pick closest to picker
2. Attempt to pick from reserve locations, prefer picks with the best handling unit fit, followed by location clean-up, followed by earliest storage date(FIFO) and followed by pick closest to picker
3. Attempt to pick from let-down locations, prefer picks with the best handling unit fit, followed by location clean-up, followed by earliest storage date(FIFO) and followed by pick closest to picker

Macro activity	Activity	Elementary activity	Time estimate calculation	Time estimate (seconds)
Receiving	Truck/Container acceptance	Truck/Container acceptance		
	Truck/Container unloading	Lift truck drives from receiving area to container on apron	Avg 70m / Avg 2.7m/sec (10km/hr)	
		Lift truck positioning for loading		5
		Loading		4
		Lift truck drives from apron to receiving area		
		Lift truck positioning for unloading		5
		Unloading		4
	Receiving and checking of inbound freight	Visual inspection and counting of staged freight + Unique ID labeling (Licence plate)		45
		RF scanning based receipt		25
Put-away	Putaway of received freight into storage or cross-docked for shipping	Lift truck positioning for loading		5
		Loading		4
		Scanning pallet ID (licence plates) and get suggested putaway location		3
		Read suggested put-away location and decide on route		5
		Lift truck travel to putaway location	Avg 75m / Avg 2.7m/sec	
		Vertical fork travel to position for unload	Avg 3m / Avg .5m/sec = 6 secs	
		Unloading		4
		RF Scanning: confirm pallet drop		5
		Lift truck travel to receiving bays	Avg 75m / Avg 2.7m/sec	

Macro activity	Activity	Elementary activity	Time estimate calculation	Time estimate (seconds)
Pickface Replenishment	Restocking of the pickface	Travel to bulk storage area (Order picker)	Avg 80m / Avg 2.7m/sec (10km/hr)	
		Request next replenishment pick-up suggestion		1
		Read suggested pick-up location and decide on route		5
		Order picker travels to pickup locations		
		Vertical positioning		6
		Loading of cartons		6
		RF confirmation scan of pick-up		5
		Travel pick-face area (Order picker)	Avg 80m / Avg 2.7m/sec (10km/hr)	
		Request next replenishment drop-off suggestion		1
		Read suggested drop-off location and decide on route		5
		Order picker travels to drop-off locations		
		Vertical positioning		6
		Unloading of cartons		6
		RF confirmation scan of drop-off		5
Picking	Picking	Travel to pick-face (On foot)	Avg 40m / Avg 1.35m/sec (5km/hr)	
		Request next pick suggestion		1
		Read suggested pick suggestion and decide on route		5
		Picker travels to pick location		18
		Loading of cartons/units		6
		RF confirmation scan of pick-up		5
		Travel packing area	Avg 40m / Avg 1.35m/sec (5km/hr)	
		Unloading of cartons		30
		RF confirmation scan of drop-off		5

Appendix B

Activity-based contract pricing

Warehousing Activity	Comment	Chargeable Unit	Price $	Anticipated activity	Anticipated recovery $
Container Unpack/Unload					
20' Container	Lift truck unpack	per FCL	120.00	120	14,400.00
40' Container	Lift truck unpack	per FCL	140.00	0	-
Receiving services					
Cartons		per carton	3.25	0	-
Pallets		per pallet	5.15	2200	11,330.00
Storage in warehouse					
Pallet storage	1.2m x 1.2m x 1.5m tall	per pallet per week	2.00	6000	48,000.00
Pickface Location		per week	-		
Pallet hire					
Pallet Hire / week			-		
Order processing					
Pallet pick		per pallet	5.15	10	51.50
Case pick		per carton per SKU	1.82	72000	131,040.00
Split/broken case pick		per item	1.30	45000	58,500.00
Outbound handling					
Carton		per carton	-		
Pallets		per pallet	5.10	1500	30,600.00
Consumables and labelling					
Pallet stretchwrap		per pallet	-		
Labelling (SSCC)		per label	-		
Inventory management					
Stocktake, physical		per hour	-		
Cycle Count		per SKU	-		
Other warehouse services					
Industrial Waste		per cubic metre	-		
Ad hoc labour		per hour	-		
Ad hoc equipment		per hour	-		
Ad hoc packaging		per item	-		
					$ 293,921.50

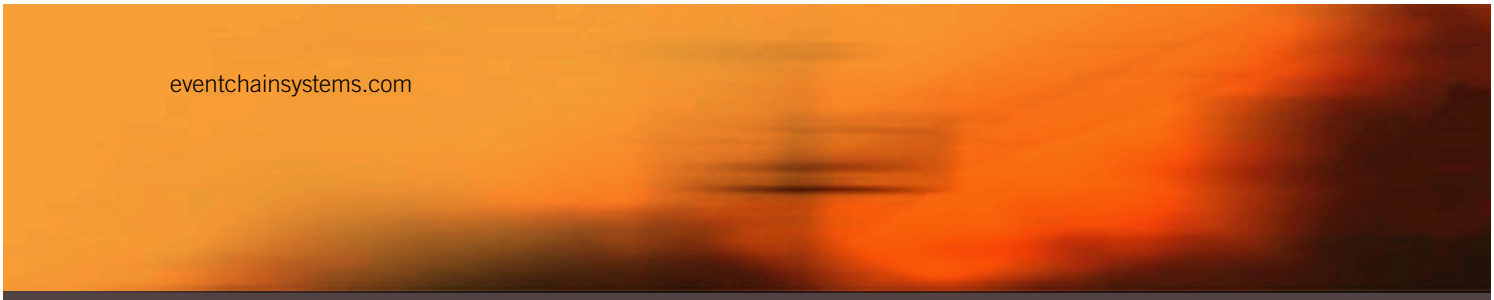
Appendix C

Vested Outsourcing Contract

Physical Components	Acquisition Type	Qty	Price $	Unit	Monthly $
Physical Network					
Logistics center and fittings	Leased	7770	10	Per m^2 per month	77,700
Facility maintenance					
Electricity					11,655
Water					1,554
Telephone					1,500
Insurance					5,439
Office expense and maintenance					
Organisation					
Management	Permanent	1	12,500	Per month	12,500
Supervisory	Permanent	2	5,800.00	Per month	11,600
Clerical	Permanent/ Contract	3	4,000.00	Per month	12,000
Operational	Permanent	30	3,600.00	Per month	108,000
Material Handling Equipment					
Counterbalanced lift trucks 2000 kg/4000 lbs	Leased	4	527.00	Per month	2,108
Reach trucks 2000 kg/4000 lbs 8m reach	Leased	2	648.00	Per month	1,296
Mid/high-level order pickers	Leased	4	730.00	Per month	2,920
Picking trolleys					
Hand pallet trucks					
Storage Systems					
Racking	N/A				
Inventory carry media					
Pallets		0	2.50		0
Cartons		0	1.50		0
IT Infrastructure Components					
RF Network	N/A				
RF Terminals	Leased	32	91.00	Per month	2,912
Workstations (Laptops and Desktops)	Leased	8	21.00	Per month	168
Printers	Leased				
Laser	Leased	8	18.00	Per month	144
Barcode	Leased	2	34.00	Per month	68
Software – SaaS WMS	SaaS	36	180.00	Per month	6,480

Physical Components	Acquisition Type	Qty	Price $	Unit	Monthly $
Consumables and waste disposal					
General					6,000
Total					

Physical Components	Total Monthly	
Physical Network	97,848	37%
Organisation	144,100	55%
Material Handling Equipment	6,324	2%
Storage Systems	-	0%
Inventory carry media	-	0%
IT Infrastructure Components	9,772	4%
Consumables	6,000	2%
Total	**$264,044**	



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