Why Fight Reality with Complexity when you can Change Reality?

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Executive Summary:
Companies that sell physical products look at their businesses through a lens of complexity. What choice do they have, with so many links in their supply chains, suppliers often twelve time zones away, DCs that are clogged with inventory, shortages, promotional discounting models, organic growth, acquisitions to digest, debt and slim net margins. Unless that reality changes, there is no reason to expect hard work will produce a better result. IDEA has a simple concept: change reality to the point that simplicity works better than complexity. The following parable provides a base for an explanation of how we multiply profits.

There is no such place as Utopia. Still, wouldn't it be nice to move closer to perfection? IDEA helps its clients move to such a simple and elegant world that it may be hard to recognize from your current reality. To understand, appreciate and implement the inherent simplicity of IDEA's approach to distribution and replenishment, it may be easier to begin from an imaginary reality. The utopian story I relate below will help you see things without the clutter of your current perspective. Once you carefully think through the scenario, you will be ready to add back only what is necessary to arrive at a new reality. IDEA's reality has been implemented and proven. Your gut feelings or common sense will scream to you that this is wholesome and good, even if your head resists … for a while.

Utopia

Imagine a very expensive but available technology exists that can instantly pull products from anywhere[1]. This makes the perfect warehouse. Everything neatly stored, stacked and racked. The quantity of each item is enough to satisfy the biggest single sale you expect to see. A customer orders something or a number of different somethings. Picking pulls the ordered quantities off the shelves. As soon as they do, the quantity just removed immediately reappears in its place. All through the warehouse, anything anyone picks is replaced by an exact copy the following second.

What is the replenishment model? Nothing more than simple one-to-one pull replacement. It is like there is an invisible string between product on the shelf and more product at the supplier. When an item is taken, it pulls another onto the shelf. There is no need for complicated forecasting algorithms. Pulling sales people off the street and into meetings to get input on demand planning becomes a thing of the past.

No Shortages
There are no shortages in the warehouses, so, sales go up. How much do shortages rob the cash registers of a typical seller? It is different from link to link but is never less than 10%. If sales increase, say, 20%, what

[1] Note: I didn't suggest magic or a cheap technology for the reason that every person and store would have access to that, allowing them to pull directly from manufacturers. Nor did I suggest that the ability to "beam" goods to another place was possible, only to pull it in. Either would eliminate resellers not be their utopia!

does that mean financially? Well, no expenses of significance increased. The extra products sold had to be purchased, of course. If margin up is 25%, then one quarter of the 20% sales increase is gross margin. To calculate the net profit impact, we subtract the operating expense associated with the extra sales. Since there aren't any expenses worth mentioning, the net profit impact is 5% of the old sales. What would adding 5% of your current sales to your net profits mean in your company?

What else is different?
It will be useful to further imagine the consequences of this splendid warehouse. Conventional warehouses hold lots of the faster moving items. In the utopian warehouse it would be a waste to have more than enough for the biggest single sale. When there is no more need for 30, 60 or 90 days worth of a certain product, the racks or bins or yards look empty. Where there were ten racks, two will more than suffice. A warehouse's required footprint would shrink to a fraction of its previous size.

Broader Line
Hold on. Before we move to a smaller warehouse, would something else change? Yes. In this new world, management would be emboldened to carry many more products – a broader selection. They don't have to worry about surpluses.

Think of wholesalers of fashion apparel. Today, store merchandisers pick from thousands of designs in many colors in a dozen different sizes. They only commit to (and it is often a "soft" commitment) a small faction of what is available. The wholesalers don't even dream of bringing in other products. They don't take chances, because the last time they did, inventory turns plummeted and cash dried up. They had to liquidate the stock at a huge loss. Perhaps, a person was blamed and fired. Once burned, twice shy.

In our instant replenishment utopia, the wholesaler offers retailers the entire potential selection, with a tiny commitment. "Try a product in a few stores, if it sells fast enough to suit you, add it into more stores. If it doesn't, leave it on your shelves for a few extra days to sell my stock. Once it is all gone, pick a different product to replace it."

The benefits of a broader line mean another huge impact on sales, much bigger than what we have discussed so far. A utopian reseller sells goods which were not on shelves before. Assume the best items were already being offered; even so, there is almost unlimited money and shelf space available from reduced safety stock and eliminating inventory above safety stocks. Selling a far broader line could result in double the current sales.

Less Discounting and Disposals
Discounts virtually become a thing of the past. The cost of disposals can be vastly different depending on what is sold. Shelf life or market life is limited for many goods. Fish merchants say sell it or smell it. Leading edge consumer electronics aren't always much better. Fads come and go. Even staples like salt or sugar can absorb enough moisture to go bad over time. Broadly, the damage from these two consequences of surplus inventory is usually greater than the damage from shortages.

Unclogged Warehouses
Don't forget that one of the problems with slow movers was that they clogged up shelves, staging areas and, not to mention, consumed cash. Many companies have even overflowed their planned for storage space and have had to rent overflow warehouse space.

Impact on Plants
Products still must be manufactured somewhere. A reseller with this technology would buy the best quality, price and value from the best supplier no matter where they were located. An implication of instant

delivery direct from the factory is that factories must hold inventory. Even for fashion items, there must always be enough on hand at the plant to be "beamed" instantly to any of the resellers that are being supplied.

Production plants must still make production runs. The runs must be big enough to be efficient and create enough finished goods inventory to serve their customers until there is an opportunity to make more of that item. On the other hand, the runs must be small enough so that they get back to making other items soon enough that they don't run out. To clarify the last point, since there are more products available in warehouses, if production runs are long for all products, it creates a longer delay between production runs for any given product. The bigger the runs, the longer the delay between runs and the bigger the runs must be and so on; every circuit around that cycle also means more inventory for the manufacturer to finance. Therefore, utopian manufacturers make small runs frequently to replenish their finished goods inventories. They prioritize and manufacture to availability. They make sales as products are zapped from their stock.

Lacking the efficiency of long production runs and since they now have to hold inventory rather than being paid in advance via letters of credit, manufacturing commands higher prices. Ouch, you say. This is not bad. Remember, wholesalers are enjoying greatly improved returns on inventory. Also, their transportation and warehousing costs are greatly reduced. Let the manufacturer have some extra price as an incentive to make sure a much broader range of products is always available. To do otherwise risks killing the goose that lays the golden eggs.

Exchanging to Enhance Product Mix

Using the new technology, it is also possible for the reseller's customers to send goods back. The reseller is more likely to have a willing buyer for the product than any one retail store, but this is not why they strongly prefer to take slow movers back. The damage to the supplier is greater, if the products are not taken back. Why? The reseller misses sales when a slow mover sits on a retail shelf. A slow mover clogging up shelf space is almost as bad as not having shelf space, for all concerned. The reseller wants a better seller in that shelf space just like the retailer does. So, in return for "beaming" the slow mover back into the reseller's stock for full credit, the store agrees to buy more from the reseller to fill that shelf space.

Changing the assortment away from slower movers uncovers new hot sellers. New assortments increase consumer interest. They come to stores more often and tell their friends. Expect this to increase sales too.

To review, the supplier and retailer have aligned interests. Antagonistic relationships are in the past. All parties work together to bring consumers the products they want. Throughout the supply chain, every link sees increased sales and profits.

Wow. Now that's a positive development. What would the reseller's customers call these miraculous changes? They would see the reseller as having a decisive competitive edge in availability – no shortages, a broader line, more life from perishable items, the newest items available and a fresh new collection of goods right along side of their old favorites. All those things contribute to a customer's perception of availability.

Every year afterwards, the company can use its decisive competitive edge to add more and more satisfied customers. Customers become more and more loyal. Year over year growth would be astounding.

Now imagine that other resellers don't know this technology is available yet. However, most will certainly get it in the next five to ten years. What should a reseller do?

IDEA's Reality

This isn't pie in the sky. As explained above, IDEA's approach, which we call Elucidate, is much closer to the utopia than to most resellers' current situation. No, we don't have a way to instantly transport goods around the world. Still, we get close to this ideal. The way is to change reality.

At every location, resellers (brands, importers, distributors, or combinations) have the same dilemma, how to maintain correct inventory levels.

> Before we can go further, 'replenishment time' must be defined. Replenishment time starts with first consumption of a particular item after it has been received and ends with its next receipt. Most people confuse replenishment time with lead time – the time it takes for products to come in after an order is placed.
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> IDEA defines replenishment time as the sum of three parts. They are order lead time, supplier lead time and transportation lead time. The last two require no explanation, but order lead time, which is frequently ignored, does.
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> As mentioned already, an SKU arrives at its destination. After the first sale, most companies do not immediately place an order for what was sold that day. Making a purchasing decision after every sale would be more work and require more people than a company could afford. So, naturally, people wait before ordering. They determine order quantities using the well known Economic Order Quantity calculation or simply based on the number of orders they can process in a day. The longer the delay before ordering, the longer the order lead time is.
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> Max/min systems ensure there is order lead time. After goods arrive, a reorder is not placed until the on hand quantity drops to a predetermined level. The wait, while consumption continues, is order lead time.
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> Order lead time will be different for the same product in every location where it resides. It is not correct to say "I order these products weekly because I buy from *Supplier XYZ* once per week", unless you order every item that was sold every week.

Each link in the supply chain requires inventory to protect sales that is proportional to demand over the replenishment time. Safety stocks must be added to protect against uncertainty (like when the ever present Murphy strikes). Recall the utopian warehouse required only enough for the largest expected single order. In reality the method is the same, except that many orders might need to be filled in the time it takes to get more. In the real world, we need enough in the pipeline to handle the most we expect to consume in a safe replenishment time. Not all of this amount must be on-hand, as long as inbound goods steadily arrive as shipments to customers go out. If IDEA can keep replenishment time low, its clients will be able to hold far less inventory.

Shrink Replenishment Time

This is the most important thing. To the extent that we can reduce the time it takes to get more from its source, we can reduce the inventory we hold on hand safely. When goods come in quickly, the duration of shortages is less and most shortages can be avoided altogether. When we speak of changing reality, this is our favorite reality to change. Our major efforts internally and with suppliers are in this one area.

All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line…[2]

Order lead time is often the biggest component of replenishment time. Elucidate completely eliminates order lead time, wherever possible. This is the first reality adjustment IDEA implements. We do not deliberate on the amount to replenish. Like the utopian model, we simply listen to consumption data and reorder what was sold daily.

What are the advantages?

1. Computers can easily handle millions of sales per day, which relieves work and worry for people and eliminates mistakes and deviations in a chore that different people handle differently.
2. There is a guarantee that exactly what was sold is replaced[3]. There is no possibility of adding more statistical noise to the replenishment process than was present in the consumption data and replenishment time variation.
3. IDEA's order quantities are smaller. So, inventory is reduced. On-hand inventory fluctuates around safety stocks plus half the order quantity[4].
4. Because we order each SKU more often, reactions to increases in demand occur sooner, which enhances availability and sales.

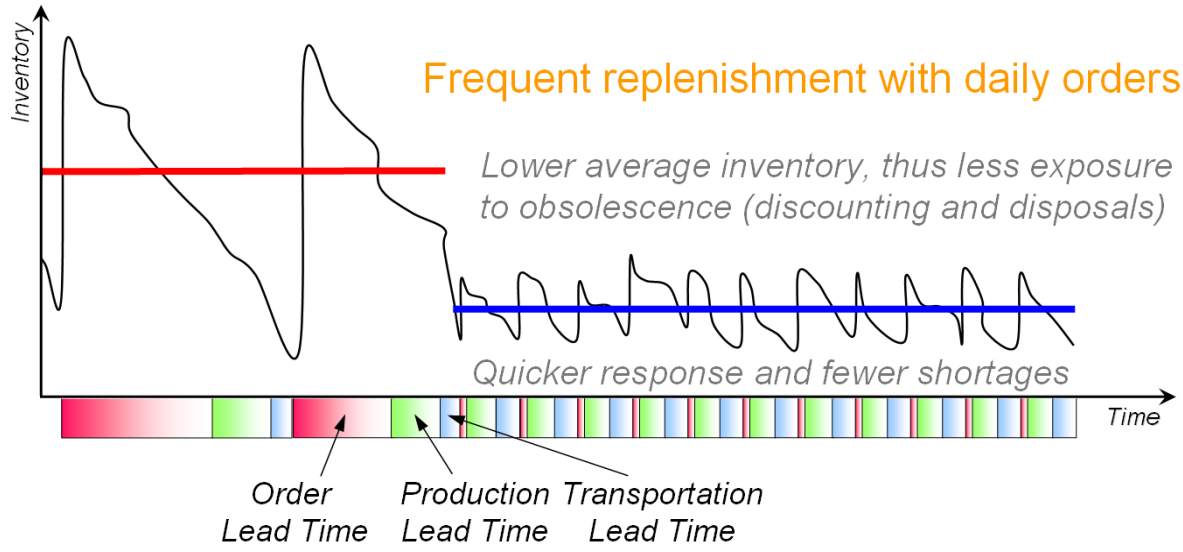

Figure 2

Buffers

Clear thinkers may reasonably ask how Elucidate manages variation in both replenishment time and demand for a product. Pools of inventory held by a reseller protect against heavy demand, long replenishment times and late delivery. IDEA calls these pools "buffers".

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[2] Ohno, Taiichi, *Toyota Production System*, Productivity, Inc. 1988, page ix (in Publisher's forward).

[3] Our first goal is to increase profits, so of course we make exceptions. For instance, if a much better cost can be realized for buying in bigger quantities, we recommend taking advantage of it. We recommend buying in full truckloads weekly instead of much more expensive less-than-truckload quantities daily. Generally, the number of deliveries only goes up when there is no cost associated with the increase. However, the number of different SKUs on each delivery jumps dramatically. Orders may also be accumulated to meet minimum order quantities and supplier minimum order sizes. Later, we work together with suppliers to improve flow and reduce batching but not at first.

[4] For those less familiar with inventory theory, here is a quick explanation. If all goes as planned, safety stocks are never used. In a Max/Min system, safety stocks are the Min less consumption following an order. Since, safety stocks are only occasionally used, due to very heavy demand or late delivery, they typically are on hand. After delivery, the on hand is the order quantity (Max – Min) plus safety stocks. Therefore, average inventory is safety stock plus half the order quantity.

Defining the concept of a buffer more fully, it includes the on-hand inventory as well as any goods that are on order but not yet arrived – inbound inventory. Once a certain quantity is determined to be appropriate for the buffer, no orders are placed while the on-hand plus inbound inventory is in excess of the buffer size. Conversely, as soon as demand reduces on-hand plus inbound inventory to be lower than the buffer, an order should be placed (subject to footnote 3 on the previous page) to top up to the level of the buffer.

A static sized buffer is fine to accommodate normal statistical fluctuations when the average demand and the supplier lead time are stable. As long as the average demand and average replenishment time don't change, what goes up comes down – the highs and lows balance out over time. The buffer acts as a shock absorber, keeping on-hand inventory within the buffer, fluctuating around half the buffer size.

One can easily imagine a situation where demand increases over time. If so, arriving orders, which were placed during a period of lower demand, are smaller than the amounts being pulled out. If this pattern continues without intervention, it is only a matter of time before the buffer is exhausted and sales are missed due to shortages. Alternately, the result of ever diminishing demand or faster delivery is too much protection. Any portion of a buffer that is never used is a waste of money and space needed to store it.

Dynamic Buffer Management

IDEA uses a buffer management mechanism to size buffers based on what is actually happening. IDEA checks every buffer every day for every SKU at each locations (with computers, remember?) If inventory in the buffer has been too low for too long, buffer management increases the size of the buffer and makes a one time addition to inventory to better protect sales. Conversely, if the buffer is too high for too long, there is more protective inventory than is necessary to protect sales, in which case, the buffer is automatically reduced.

People can approve these buffer changes until a comfort level is reached, but experience shows it usually works better if they don't interfere.

Rarely, there are times when IDEA's approach cannot adjust for demand changes fast enough to avoid a shortage. Take the example of a repeated promotional activity which is known to triple sales within one replenishment time, and the lift lasts for two or more replenishment times. This is dramatic enough to require intervention. It need not be human intervention. IDEA's system can accept the expected lift information electronically or just notice it from provided forecast data. If the boost was unforeseen, expediting may be called for.

Much more commonly, the forecast increases 40% during the back to school season or people begin to respond to product improvements. Buffer management takes such changes in stride, automatically adjusting the buffer size as needed. Buffer management is a robust mechanism that significantly reduces stock outs, even without supervision.

Manage Buffers not Replenishment

This is the third major way IDEA shifts reality. Rather than frequently guessing when and how much to replenish, you move to a consistent, rule-driven methodology for occasionally adjusting buffer levels. Retailers often zig or zag when hindsight shows they shouldn't have. When such decisions depend highly on the varying skill and experience levels of managers, results can vary greatly. Buffer sizes should only adjust as a result of a prolonged change in reality: when there is either clear excess inventory, or risk of a stockout. IDEA's buffer management is easier, scalable and results in better availability and far less volatility than the conventional approach.

Where should Buffers be?
Now that there is a mechanism to manage buffers, where should they be located?

Conventionally, inventory is held close to the consumer. Inventory in a store or region becomes effectively committed to that location. Even systems that work beautifully in the direction of product flow usually fall apart when reverse logistics are needed. It is more likely that a store will discount to reduce its surpluses than it is that the store will cross ship product to another store, even when the other store is desperate for the goods. When cross shipment does occur, the expense is in addition to normal expenses. Is this wise? IDEA thinks not.

Perhaps counterintuitively, IDEA holds all inventory except for the required buffers away from the consumer. Most inventory is in a central warehouse or at the supplier's warehouse, presuming it isn't too far away. Less inventory is held in regional warehouses which are used to save freight expense. Least of all resides at retail. (Note that there are cases where concerns about the attractiveness of visual display result in an increase in store inventory. This may be perceptually correct but, technically, there is no reason for it.)

Our approach avoids inventory being effectively committed. Inventory is diverted to the link that needs it most only when the need exists. Since central inventory buffers naturally have more aggregation of demand, the variability which is seen so clearly at a specific retail store is balanced out by the many stores served. Safety stocks which protect against variation are a much smaller percentage centrally than they must be locally or regionally. Therefore, there is inventory saved.

In every location inventory buffers are initially sized using an optimistic forecast, factoring for the risk of late delivery. Once set, buffer management takes over to maintain the buffers at the proper levels for the realities of each situation. The overall result is inventory levels are typically half as much, system-wide.

How Much does this Cost?
IDEA charges in two ways. First, as consultants, we are paid only if we deliver results. IDEA triggers bonuses based on improved net profit return on inventory. We ask our clients to tell us the best return on inventory they can imagine getting. This is usually beyond what has taken place historically. We then ask them to quantify the lowest return on inventory which they are sure is currently impossible. We now have three benchmarks: current, excellence and impossible.

If we do not help a client surpass the impossible level, then an argument could be made that there was some other cause of the beneficial result. When we earn bonuses, we want our clients certain that the improvement could not have happened without IDEA. Always, bonus amounts are small fractions of what the client earns in new net profit annually and of the cash our transformations recover from inventory.

The second way IDEA is paid is through relatively small fixed fees. These unconditional monthly payments protect the client in two ways. First, the monthly fees helps ensure that IDEA doesn't go broke before bonuses kick in. A client can't afford IDEA to lose focus due to financial worries, especially when the stakes are so large. For the same reason, IDEA bills for its expenses incurred in servicing the client. The second risk these fees protect a client from is the risk that the client becomes distracted. Unless the client has enough skin in the game, the client may lose focus. The fixed fees should be enough that the client is unwilling to waste such a monthly amount. In other words, the client feels compelled to be sure they are getting their money's worth.

IDEA's Typical Impact on a Client

All blue percentages are of current sales				
	Current		IDEA	
Sales	100%		150%	
Gross Margin	30%	30%	53%	35%
Net Profit	2%	2%	25%	16%
Turns	4		8	
Inventory	18%		12%	
Return on Inventory	11%		201%	

Figure 3

Notice in the table labeled Figure 3 above, that net profits increase over 12 times. Six percent of their old sales drops out of inventory and back into cash, in just a few months. The impact would be even greater if gross margins are higher and beginning turns are worse. In the spirit of win-win, the client won't mind sharing a small fraction of their huge gains (which IDEA quantifies and explains in periodic reports and meetings).

In the example set forth in Figure 2, what does the client do with the 6% of sales that appears on the balance sheet? There are two options.

First they could pay off debt. If they do, assuming they pay 7% for their money, they will save interest expense equal to 7% of 6% of sales (0.42% of current sales) – good.

Second, they could hold a wider variety of products using the freed up shelf space. If they do, they will earn a 201% return on the additional 6% of inventory (over 12% of current sales) – much much better.

IDEA calls its methodology Elucidate. It is a game changer. Think about it, a huge multiplication in profits without adding any complexity. Replenishment times drop, allowing the client to react to actual consumer demand. There is no added complication, rather life at work becomes more simple without the need to forecast and constantly decide how much to order. Generally, operating expenses remain about the same.

If a retailer wants to expand their number of locations or a supplier wants to add to their product lines (and why not?), it does so from a much more stable financial platform, with much less risk and reliance on debt. IDEA makes this possible by fixing the replenishment model. Few changes are needed from the client operationally. The changes we require happen between the ears. Feels right, doesn't it?

IDEA'S WAY OF THINKING

- *Neither an accurate forecast nor changing vendors is required for success*
- *There is a way to both increase sales and reduce inventory*
- *Supply chains sell less when clogged with inventory*
- *In the long term, unless the supply chain sells more no link can sell more*
- *We must help clients gain buy-in internally and with supply chain partners*
- *The majority of our fees are based on improved return on inventory*

IDEA'S METHOD

- *Verify the existence of inventory imbalances and the benefits of moving from a "Push" to a "Pull" system*
- *Gain top management buy-in to the assessment and support of the approach*
- *Build knowledge and understanding across the supply chain, at all levels*
- *Utilize systems that deliver actionable information, integrated with existing software*
- *Work with you until expected results are achieved*
- *Share the tools and know-how to continually improve results*

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