Push / Pull logistics in the real world

I've spent 5 years supporting the military's logistics in one form or another across two continents and on two deployments to Afghanistan. I have had the wonderful opportunity to witness it done correctly, and the horrible curse of being present for utter failure. In both cases I was able to learn from the success or failure, but each time the end goal of a perfect logistics model became more and more elusive. Finally I was forced to conclude that there is not a perfect solution for any given supply or logistical demand, but a perfect state: a net zero demand push/pull.

First, a brief explanation of push and pull logistics for anyone unfamiliar with the terminology. The term "push" means that demand is met by excess supply without the need for user request. The user has all supply needs met prior to any deficiency, at the expense of the provider. This results in maximized readiness for the user, and minimized efficiency. The United States Government is one of the few organizations that can afford (kind of) to provide a push supply system, but even then the gross inefficiency results in either exponentially growing cost, or as was the case many times in Afghanistan, the diverting of supplies from one stream to another in order to stay ahead of user demand. Besides being the most user friendly, this also requires the least planning or oversight. The supplier simply pushes all assets as quickly as they are procured, ideally with minimal time between procurement and allocation. An easy analogy to this model is a man driving a car down the highway and stopping at every gas station along the route regardless of how much fuel is in the tank. The man has little risk of running out of fuel, but will probably spend as much time pulling into, pumping, and pulling out of gas stations as he will driving on the highway.

In addition to the cost prohibitive nature of this practice, there are two less tangible effects I have observed. First, if the demand of the user ever out paces the suppliers logistical ability to acquire and distribute, there is no reserve or emergency supply to be used as a stop gap. This model also requires the rate of consumption to either equal or be less than the rate of procurement, which in practice means the rate of procurement is increased above projected demand to ensure a "safety margin." This is how you get thousands of brand new MRAP's that immediately become scrap metal; the pressure is placed on procurement. Second, there is no benefit or incentive for efficiency. The user is going to get the supplies, and the supplier is going to push whatever they can as quickly as they can. Until a manager exceeds his suppliers' procurement rate, there will be no need to monitor or curb usage.

Pulling, on the other hand, is the opposite. The net supply to meet demand is kept at zero until requested, and upon filling the request the net supply is returned to zero. By forcing the user to actively request supplies, efficiency is often maximized while readiness is minimized. To return to the man

driving on the highway analogy, this model equates to the man only stopping for fuel after his low fuel light illuminates. He will probably be very time efficient while traveling, but he may not make it to another gas station if the light illuminates in a sparse area.

In addition to the potential for decreased readiness, a pull model can have two conditioned effects on users. First, depending on the complexity of making a request or the turnaround time it will force the user to plan and track usage. Second, because of the uncertainty on behalf of the user to the supply of additional resources; efficiency is incentivized because the act of "pulling" can be considered either another obstacle or friction point in operations. Therefore, users are more likely to try and maximize time between "pulls." The tradeoff, however, is that because the user is now assuming full responsibility for the actuation of the supply chain then operations may be pushed to less effective methods in response to attempts at maximized efficiency. Or, to return to the analogy of the car driver, because the driver knows that eventually the fuel light will illuminate he drives slowly in order to maximize fuel efficiency. He now can travel a further distance before he needs to stop for fuel, but his trip make take twice as long.

Practically speaking, no sensible organization would use either push or pull model without an effective resource prediction or need anticipation system. Most times a combination of push and pull are used according to the needs of a given set of circumstance. Our driver on the highway may read a sign that says, "Last fuel stop for 45 miles." He would then consult his current resources (the fuel tank) and make a decision as to whether or not to stop for fuel. This is the crux of supply chain management, to be the effect resource predictor. Numerous other studies, papers, text books, etc. have been devoted to the science of supply chain management; this argument is trying to bring a focus, often tracked with only dollars and time, back to the theoretical STATE desired.

And so, returning to the thesis: a net zero push/pull state is the ideal set of circumstances in which the user is pushed supplies at the exact moment they are required or pulled. While this may seem intuitive, a broader understanding of exactly what that state means reveals the myriad complexities of attempting to achieve a net zero push/pull. To reach that understanding we will compare what is, and was is not, a net zero push/pull.

A net zero push/pull is achieved through effective data analysis and usage prediction. A net zero push/pull is the sum of acquisition minus consumption equaling zero. It is the simultaneous occurrence of need and supply, achieved at end of a distribution chain. It is the balance of self-sufficiency and efficiency with dependency and readiness.

A net zero push/pull state is not a deficiency or surplus of resources in storage. Logistics is the act of acquiring and distributing that which is needed to those who need it. The time between acquisition and distribution may or may not require storage, therefore the desired net zero state is unaffected by what is or is not in storage. Even though that may have a direct impact on the suppliers' abilities, it is not a metric reflecting the perfect state. Further, the net zero is neither an increase nor decrease in resources allocated. It is the act of allocating exactly what resources are required and nothing more.

Finally, why is this important? Because fundamental beliefs within a logistical system have second and third order effects. If a manager is attempting to streamline a supply chain, one could imagine that the two largest indicators and metrics used to determine efficiency are time and money. While those two nouns are immensely important, they are not meant to be the fundamental building blocks of efficient logistics. Instead of the manager implementing changes for the sake of time or money, those changes should focus on progress toward a net zero push pull relationship. As the system moves closer and closer to that perfect state, time and money costs will by definition be minimized.

In conclusion the pinnacle of logistical harmony is achieved at a net zero state between push and pull requirements. And by extension the most economically efficient balance is reached by the same means. In order to realize these benefits, a logistical need must first be met with a system that seeks to achieve this state. In so doing the economical benefits will be realized simultaneously as maximized efficiency. I can return to my observations and re-iterate that this is only in theory, never is there a self sustaining logistical system in this state without guidance and changes as required.

RAPTOR INDUSTRIAL SOLUTIONS
2677 North Eastman Road
Suite 1100
Midland, Michigan 48642
Email: info@raptoram.com
Tel: 989-492-0028
Web: www.raptoram.com