



## DDMPR – Demand-Driven Material Requirements Planning & the DDAE – Demand Driven Adaptive Enterprise

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In the past few years, DDMPR has emerged as a significant breakthrough in the management of complex supply chains, including manufacturing, distribution, retail, and MRO stores and logistics. For almost all supply chains, it now offers a rapid and low-risk improvement ‘quick-win’ – a ‘silver bullet’ for supply chains.

DDMRP stands for Demand Driven Materials Requirements Planning, and is claimed to deliver significantly improved performance in modern supply chains subject to uncertainty and variability, compared to the MRP methods that are built into most major business ERP systems.

It has been implemented by a wide range of sectors, from FMCG manufacturing to retail, and from bespoke manufacturing to distribution. And all the published case studies support the claims that dramatic improvement is possible to achieve quickly and at low risk.

DDMRP is built on the principles that to have the highest performing supply chain, systems need to be highly responsive and agile to changes and variability. DDMRP does NOT focus on improved forecasting, nor does it use forecast demand to trigger manufacturing and supply orders, or try to use complex algorithms to “optimise” the system. It designs the system to be robust enough to cope with change and variation. The “bullwhip” or “Forrester” effect is removed ensuring that variation in one part of the supply chain is not transmitted to the other parts.

### The Benefits:

- Improved service levels, at lower inventory levels. Typically achieving 95%+ availability/due-date, with 30-50% less inventory
- Releasing cash tied up in inventory
- Significant lead-time reduction, of upto 85%
- Increased throughput from the same assets
- Additional sales opportunities due to improved performance and shortened lead times

- Fast to learn and implement: Quick-wins can be obtained in weeks.
- Low-risk implementation.
  - Easy to simulate (“What would have happened with last year’s demand if we had operated under DDMRP?”)
  - Fast to test
  - Possible to pilot and implement in stages

**Background:**

DDMRP was developed and codified by Carol Ptak and Chad Smith, who authored the latest edition of the “bible” of MRP (Orlicky’s Material Requirements Planning, McGraw-Hill, 2011). The method builds on ideas from several improvement methods, including TOC, Lean, and Six-Sigma, and was developed to work alongside existing ERP systems. It has been developed over two decades of experience in implementing improvement projects across a wide range of organisations.

DDMRP itself is the day-day method for managing inventory and its replenishment, and manufacturing and distribution operations. It was the first part of the wider process to be formalised and made public. The DDAE is the overarching business process that ties day-day operations (DDMRP) to the wider business plans and strategies. It also includes a maturity model for organisational progress along the “demand driven path”.

Most organisations start with DDMRP, because it is a quick implementation that delivers fast results. Implementing the DDAE model then ensures that this is embedded into the business’s planning processes so that the organisation can take strategic advantage of the improved operational performance.

**DDMRP in Outline:**

1	Inventory Positioning	Strategically decide the optimum position to hold inventory in your supply network. Where BEFORE what and how much.
2	Buffer Profiles	DDMRP refers to the stock held at specific positions as a “buffer”. Each inventory position has an allocated ‘buffer profile’, based on the key parameters for the item. This indicates when materials should be requested from the upstream steps in the supply chain, the average amount of stock that will be held, and replenishment/order quantities. Stock quantity in each buffer is divided into three zones – red (warning) yellow (normal) and green (high/full), which are used by the following step to ensure the ideal balance between too-much and too-little stock.
3	Dynamic Buffer Management	Actual stock levels are monitored against the buffer profile, and the profile is adjusted, either downwards to reduce excessive stock levels (stock mostly in the green buffer zone), or upwards where levels drop too low (stock level mostly in the red zone). <i>DDMRP software makes these adjustments automatically.</i>
4	Demand-Driven Planning	SKU-level planning uses a defined formula to trigger manufacturing and supply orders from upstream steps in the supply network. This compares actual stock and orders, with the buffer profile. Planners use the simple red-yellow-green system to focus on the small number of SKU’s that require intervention.

		S&OP and long-term forecasts are integrating into the methodology, and are used to revise the buffer profiles so that the system is adapted ahead of any possible significant changes in demand, but without committing definite orders to make/supply against the forecast. This means that most changes and inaccuracies in forecast are accommodated by the system without close human intervention.
5	Visible and collaborative Execution Management	<p>A DDMRP system is much more self-controlling than a typical MRP system. MRP often requires human intervention to change the system recommendations, or to make adjustments when changes happen. DDMRP can cope with demand variations of +/- 50% with almost no intervention.</p> <p>Larger variations are flagged to planners with enough warning for them to intervene and avoid problems. The system focuses attention on the key areas requiring action. Use of a simple red-yellow-green coloured buffer focuses attention on areas that may be starting to go out of control – prompting early intervention. As well as stock levels, coloured buffers are used with make/supply lead times and also for equipment utilisation in manufacturing environments.</p>

The DDMRP Method consists of five steps

As well as stock, DDMRP also uses time and capacity buffers to manage the broader supply network (in-house manufacturing and external suppliers). These are also managed using Red-Yellow-Green colour coded buffers to focus attention direct intervention actions.

## Systems:

DDMPR can be implemented with simple manual systems, using just a spreadsheet. In fact, many implementations do this to quickly test the idea, and get “quick wins”. However, for any sizable implementation, software is required.

At the time of writing (mid-2016), only one ERP system (NetSuite) had an integrated DDMRP module option (from a 3<sup>rd</sup> party provider).

This means that most companies implementing DDMRP use independent 3<sup>rd</sup> party systems that integrate with ERP systems. The Demand Driven Institute certifies software that complies with DDMRP principles ([http://www.demanddriveninstitute.com/software\\_compliance.html](http://www.demanddriveninstitute.com/software_compliance.html)).

Note this certification is NOT a subscription service, and vendors do not pay to be certified, keeping the assessment fully independent.

## Further Information:

- Introductory Videos:
  - <https://vimeo.com/208396607> (15 minutes)
  - <https://vimeo.com/140818989> (longer at 43 minutes, a history from Carol Ptak and Chad Smith of where the idea of DDMRP came from)
- [www.demanddrivenmrp.com](http://www.demanddrivenmrp.com). The site supporting the main textbook on DDMRP - *Demand Driven Material Requirements Planning*, Ptak & Smith; Industrial Press 2016; ISBN 978-0831135980

- [www.demanddriveninstitute.org](http://www.demanddriveninstitute.org) (DDI)
- Training:
  - The DDI runs several accredited 1- and 2-day training programmes, through accredited affiliates (<http://www.demanddriveninstitute.com/education>)
  - Certifications are available from ISCEA, based on an online examination. Two of the DDI courses are designed to align with these certifications - Certified Demand Driven Planner ([www.iscea.org/cddp](http://www.iscea.org/cddp)), and Certified Demand Driven Leader ([www.iscea.net/cddl](http://www.iscea.net/cddl)).
- Presentations from the 2016 Demand Driven World conference can be seen at <http://demanddrivenworld.com/demand-driven-world-presentations-2016/>
- Case Studies library from DDI – regularly updated, with PDF and video presentations, usually by companies who have implemented DDMRP.  
<http://www.demanddriveninstitute.com/case-studies>
- Overview of the Demand Driven Adaptive Enterprise Model  
<http://www.demanddriveninstitute.com/demand-driven-adaptive-enterprise-m>
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## The Buyers' Bottom Line:

1. If you buy items that are held in inventory by your organisation, particularly where stock is held in different locations, DDMRP can help you to increase item availability, at lower levels of inventory.
2. If you procure important items, and your key suppliers are not using DDMRP, there may be the potential for them to improve delivery performance, reduce lead times, and lower their own costs through its use. Obviously this would be a major change, and many will resist, but the potential is great if you initiate and support them in such a change. After you have spoken to your suppliers about this, if they keep working using their existing ERP/MRP systems are choosing to do so, you could argue that it is unreasonable for them to expect the buyer to subsidise their choice to remain inefficient, for example through passing their higher costs onto their customer.
3. If your organisation involves manufacture and complex supply networks, DDMRP offers a great improvement potential. Although in many organisations this is not in the formal areas of responsibility of procurement, it has a significant impact on how effectively the whole supply chain, from supplier to customer, performs.
4. Most organisations waste time and money purchasing complex optimisation software for supply chains. DDMRP does not optimise, it is based on the science of Complex Adaptive Systems, which says that it is impossible to optimise systems such as supply networks.
5. Virtually all DDMRP implementations were done at zero cost – even using consultants and new software. The cash freed up from reduced inventory itself more than covered implementation costs. This is without putting a value on the ongoing top-line benefits from much shorter lead time, higher service levels, and freed up capacity.

Simpler supply chains, such as pure distribution, or spares and raw materials management, whilst they can use DDMRP easily, can also use simpler 'pull-replenishment' approaches to improve their systems, or DDDRP (Demand-Driven Distribution Requirements Planning).

DDMRP needs very little, if any external support for implementation.

1. Take the training course
2. Manually pilot using DDMRP on some key existing stock positions
3. Measure the improvement and define a business case
4. Choose a DDMRP-certified software that will interface with your ERP
5. Roll-out/Implement

But if you want any help in accelerating your progress, I'd be delighted to help

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