Miba Bearing US LLC

Demand Driven Journey Update – July 2017

Demand Driven World
transforming push and promote into position and pull

Miba Bearings US Core Applications

We produce bearings for various industrial applications:

- Heavy Duty Truck Engines

- High Speed Diesel & Gas Engines

- Locomotive Engines

- 4 Stroke Medium Speed Diesel & Gas Engines

- 2 Stroke Engines

- Compressors & Gas Turbines

Demand Driven World
transforming push and promote into position and pull

Customers

Demand Driven World
transforming push and promote into position and pull

Miba Bearings US- McConnelsville, USA

Founded in 1952

Miba since 2001

283 Employees 2017

Demand Driven World
transforming push and promote into position and pull

Miba Bearing Division

Miba Demand Driven Journey Timeline

1996 – Began Lean Initiatives, Constraint Management Program

2001 – Purchased by Miba

2005 – SAP

2007 – First CMG Conference and Demand Driven Exposure

2008 – First Model focused on TOC principles:

- Implemented Drum Buffer Rope (DBR) scheduling and Execution and excel based finished goods stock buffer.

- We got great results and were "allowed to be Miba Maveriks"!

2012 – Began our backslide in terms of schedule and reliability to our customers.

Drivers for Change Then and Now

Sales growth since 2005 created more and more complexity. This accelerated in 2009!

Annual Sales (millions)

92%

Volatility of our markets is higher than ever!

Demand Driven World
transforming push and promote into position and pull
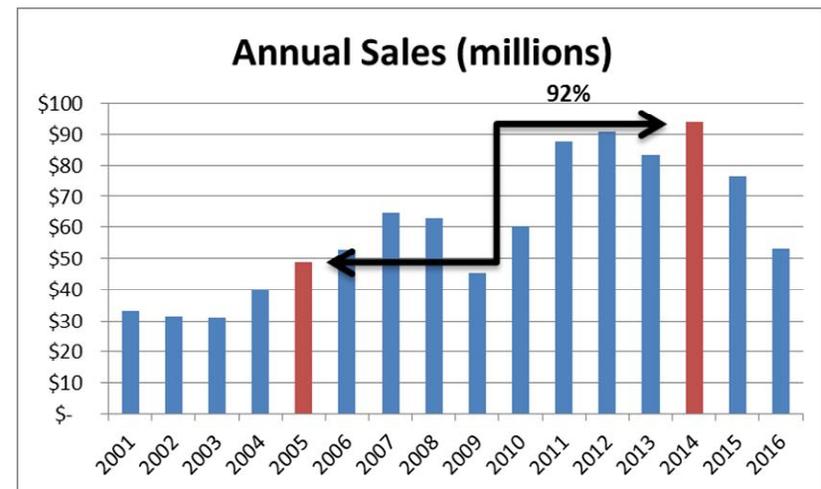
Drivers for Change

On Time delivery declining and erratic.

Demand Driven World
transforming push and promote into position and pull
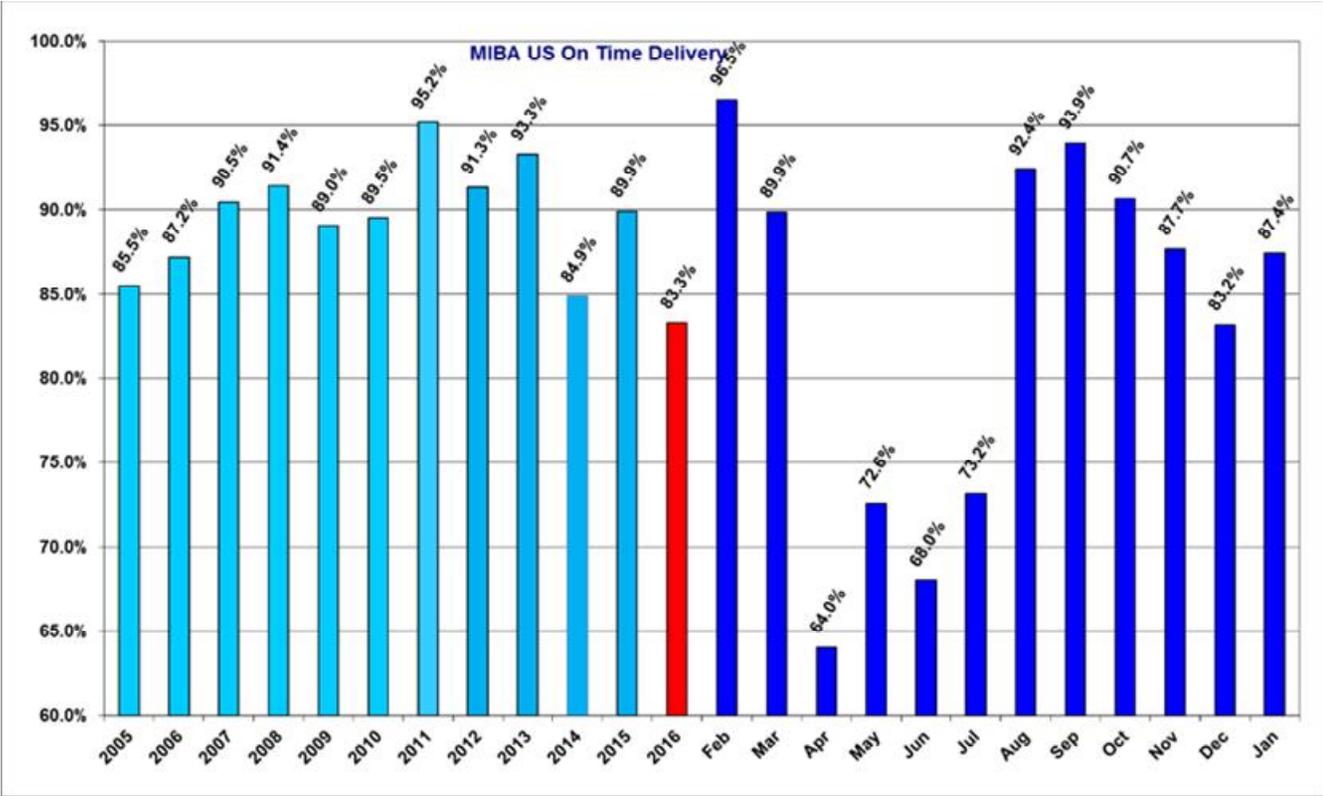
Miba Demand Driven Journey Timeline

2016 – Decision to renew our commitment to become Demand Driven:

- October – DBR System Audit:
  - We had drums and buffers everywhere and nowhere!
  - We had adapted but used the wrong "rules"!
- November Demand Driven Design Workshop.
- December Project Implementation "kick off".

Restart Committment to Demand Driven

CMG Audit/Recommendations DDMRP strategic decoupling design added buy parts and intermediate parts to decouple variation and shorten manufacturing lead times:

- Add more items to R+ based on ADU reviews;
- 70% of sales are now replenished with strategic stock buffers.
- Install R+™ to provide real time priorities to purchase, plan and schedule.
- Demand Driven Workshop

Restart Committment to Demand Driven

Demand Driven Design Workshop Outcomes:

Model DDMRP in R+ ®

Model Changes in DBR+™:

- Level Loading at convergence points rather than machining cells - reduced push and created pull.
- Provide alternate routings to resources previously "dedicated to cells" when overloads occur.

Improve scheduling and execution:

- Central scheduler rather than 5 schedulers for each product line and dedicated machine cells;
- Refocus planning and operations personnel on Flow using the DBR / R+ visible signal priorities;
- Drive our daily decision making based on Flow to and through the buffers – Smart Metrics!

Automate our SAP and R+/DBR+ interfaces with ADX:

- Reduce redundant transactions, increase efficiencies for planning and scheduling to spend time on buffer management not data entry.

Miba Demand Driven Journey Timeline

Mid March 2017 – Demand Driven Operating Model "Go Live" was official and 1 through 4 of our workshop outcomes were accomplished:

- All of our model attributes were populated in our software tools to match our new design;

- We began to make decisions with our new tool set and visibility to begin to build our stock buffers;

- Centralized scheduling ensured scarce capacity is prioritized and used to protect all strategic stock buffers across all of the product lines;

- We began daily buffer meetings, reinforced planning stock buffer orders to the top of green every day and using time and capacity buffer management to execute our schedule;

- We began to enforce transaction discipline to record control point start and stop times and record buffer entry and capture reason codes for red and late zone entries.

R+® Dashboard View of Planning and Execution

Drive to 0 unplanned order status in Critical (dark red), high (red) and yellow zone priorities by 2pm daily.

The goal is to have current notes for every Execution Alert.

Current Planned Order Trends
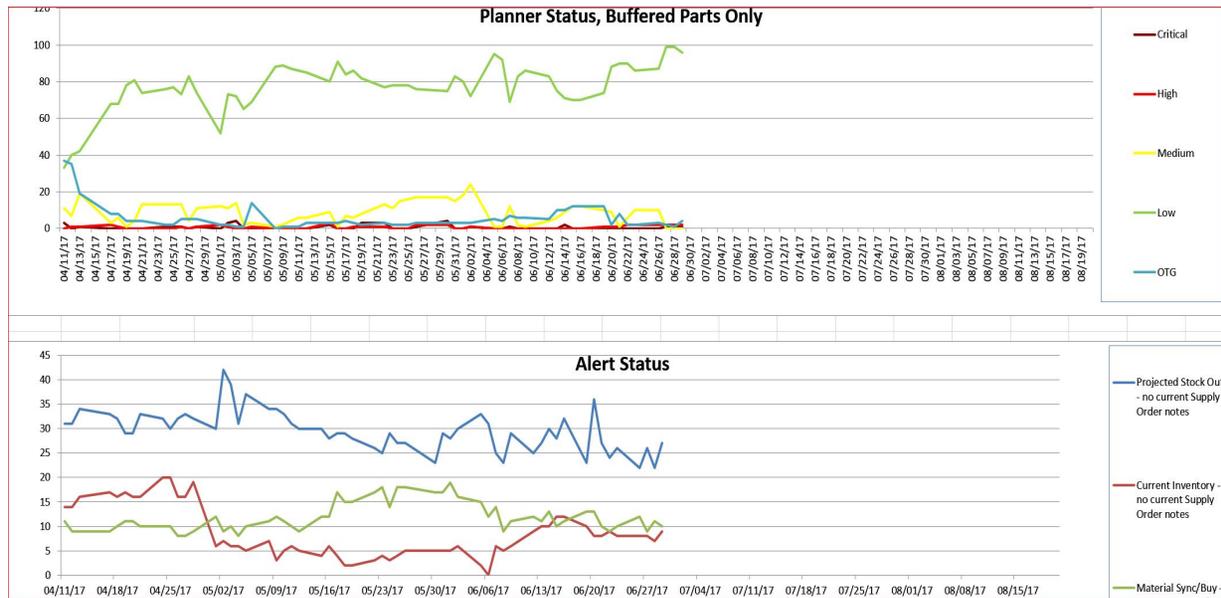
Planning - The top chart shows the number of open planning priorities. We want the green bar to be high/trending up and the other colors low and trending down. Good job!

Execution - The bottom chart shows the "Execution Alerts" that do not have current Supply Orders notes entered against them. In all instances we want the trends to be down and if there are "unmanaged alerts" (as in the view above) we want the red & green bars to be lower than the blue bar.

Miba Demand Driven Journey Timeline

April 2017 – The Tsunami hit – 60% increase in sales and no warning.

- We had only just begun to build our stock buffers.

- We panicked, went back to some old bad habits of flooding the floor with work orders and collapsed our new stock buffers;

- We started drowning in WIP and lost our visibility to priorities;

Demand Driven World
transforming push and promote into position and pull

DBR+™ Loading Reflects All of Our Real Demand

System Load Graph on June 15
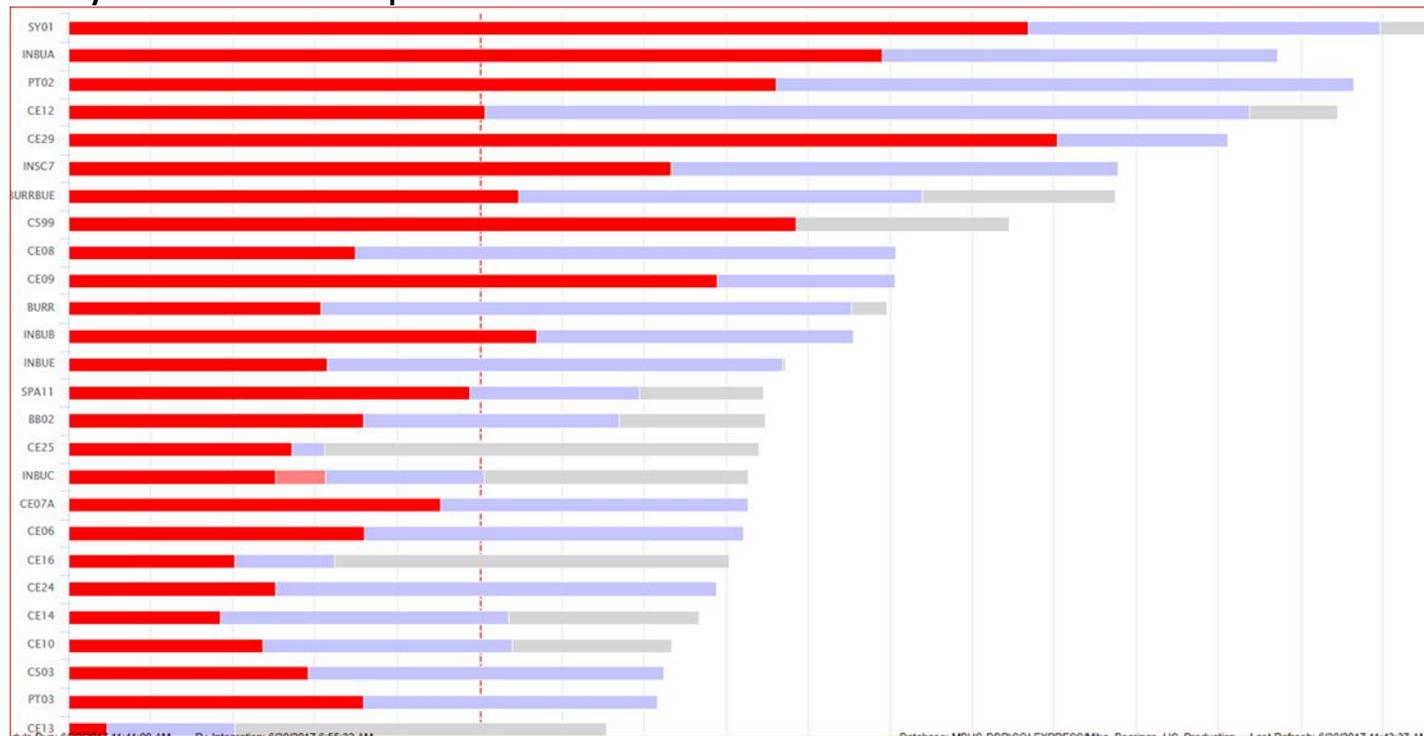
But we struggled with the priority of the orders because of our 60% sales!

Demand Driven World
transforming push and promote into position and pull

15

Miba Demand Driven Journey Timeline

June 2017 – We worked with CMG, restored discipline and used our tools to manage our way to the surface:

- We agreed on the priorities to load our drums for both make to order and make to stock;

- We removed all excess work orders that hadn't been started by the floor and "unreleased" it in DBR+ so that daily each work order is scheduled with its "new" priority;

- Daily we release only the highest priority work at the rate of our drums.

- We are working our way out of chaos and have a clear path forward.

Scheduling - Our Daily Drum is Load Based On **Todays** Buffer Status and MTO Promise Dates Priorities

- We set different priority levels for Replenished, Min Max and NB parts.
- All work orders priorities are updated from R+™ every time the scheduler is run.
- We schedule in daily buckets and release one day of work to the floor.
- ***ONLY unreleased work orders*** *(orders that have not been released to the floor)* ***are rescheduled on the drums with the "new priority".***

Demand Driven World
transforming push and promote into position and pull

Execution - Our Shop Floor Schedule Doesn't Change Unless..

The buffer manager and scheduler determine a priority must be expedited. They can raise a work order to an expedite status and it will move to the top or resource list.

- Released order schedules are locked. We don't introduce variation by changing the schedule unless we are in danger of missing a shipment due to a stock out.

- Priorities are updated from R+® every time the scheduler is run. Priorities are visible to everybody on the and the Resource Schedule below.

Resource Schedule

Resource: C1 - Resource C1 (constraint) ▼   ☐ Show Only Ready To Start ☐ Show Unreleased

Filter: ○ Constraints ○ Non-Constraints ◉ All

Dispatch List

Ready	Work Order	Sales Order	Work Order Qty	Part	Customer	Priority	Expedite	Status	Start	End	Full Duration	Receive Qty	Start Qty	End Qty	Seq	Operation Notes
	333002-1	T3-4547	40	FPA	Alaska Airlines	5	Expedite	Released, awaiting start	2/4/2016 9:41 PM	2/5/2016 4:51 AM	7.17 hours	0	0	0	300	Mill & Bore
	393002-1	T3-4547	10	FPA	Sony Corp	7	-	In progress at R2	2/3/2016 1:47 PM	2/3/2016 3:57 PM	2.17 hours	0	0	0	300	Mill & Bore
	356010-8	356010	18	FPC	Alaska Airlines	4	-	Released, awaiting start	2/4/2016 9:25 AM	2/4/2016 1:11 PM	3.77 hours	0	0	0	300	Mill & Bore
	356009-8	356009	20	FPC	Starbucks	4	-	Released, awaiting start	2/4/2016 5:15 AM	2/4/2016 9:25 AM	4.17 hours	0	0	0	300	Mill & Bore
	356009-7	356009	20	FPC	Starbucks	4	-	Released, awaiting start	2/4/2016 1:05 AM	2/4/2016 5:15 AM	4.17 hours	0	0	0	300	Mill & Bore
	356009-6	356009	22	FPC	Starbucks	4	-	Released, awaiting start	2/3/2016 8:31 PM	2/4/2016 1:05 AM	4.57 hours	0	0	0	300	Mill & Bore
	55001	T1-4545	48	FPA	Boeing	5	-	Released, awaiting start	2/4/2016 1:11 PM	2/4/2016 9:41 PM	8.5 hours	0	0	0	300	Mill & Bore

What have we learned? Change is Relentless

Develop a model review and improvement process:

1. Maintenance of our model is critical.

    *   Develop the discipline to stay focused on Flow;

    *   Publish the "Smart Metric" trends daily, weekly and monthly;

    *   Monthly routine model reviews with the operations, planning and customer service team;

    *   When the model changes be certain roles and responsibilities stay aligned.

2. Routine system audits are a must.

3. Culture change for operations is difficult and requires discipline by the responsible upper level management team to repeatedly communicate the key philosophies and foundation points in our model.

Next Steps

Finish what we started.

1. Build replenishment buffers.
2. Stay disciplined........"Culture change for operations is difficult and requires discipline by the responsible upper level management team to repeatedly communicate the key philosophies and foundation points for our model."
3. ADX installed in August.
4. Focus on improvements from pareto has developed from reason codes and diligent focus on buffer boards.
5. Continuous model improvement and attention to detail on replenishment changes

Questions

Thank you!

?

Demand Driven World
transforming push and promote into position and pull