CH
Oct 2024
Valeri Carrasco

Demand Driven World

Mettler Toledo Business Case

Agenda

1	Mettler Toledo overview (2 min)
2	DDMRP Pilots (3 min)
3	DDMRP implementation (10 min)
4	Post DDMRP: Demand Driven Execution Priorities (5 min)
5	Post DDMRP: Auto Pilot (4 min)
6	Conclusions (2 min)
7	QA (4 min)

METTLER TOLEDO

METTLER TOLEDO (NYSE:MTD) is a leading global supplier of precision instruments and services. We have strong leadership positions in all of our businesses and believe we hold global number-one market positions in most of them. We are recognized as an innovation leader and our solutions are critical in key R&D, quality control, and manufacturing processes for customers in a wide range of industries including life sciences, food, and chemicals. Our sales and service network is one of the most extensive in the industry. Our products are sold in more than 140 countries and we have a direct presence in approximately 40 countries. With proven growth strategies and a focus on execution, we have achieved a long-term track record of strong financial performance.

$3.788 billion
Sales

30.4%
Adjusted Operating Profit Margin

$38.03
Adjusted Earnings per Share

$908 million
Free Cash Flow

~17,300
Workforce

On the cover: METTLER TOLEDO's entirely new portfolio of standard and advanced laboratory balances was designed with sustainability in mind and redefines simplicity, seamless data management, robustness, and reliable high performance. METTLER TOLEDO is a global leader in precision laboratory instruments.

Portions of this report may contain "forward-looking statements" under the Private Securities Litigation Reform Act of 1995. Forward-looking statements are subject to risks and uncertainties that could cause actual events or results to differ materially from those expressed in or implied by the statements. Further information concerning issues that could materially affect financial performance is contained in the "Forward-Looking Statements Disclaimer" and "Factors Affecting Our Future Operating Results" sections of the 10-K.

Financial Highlights

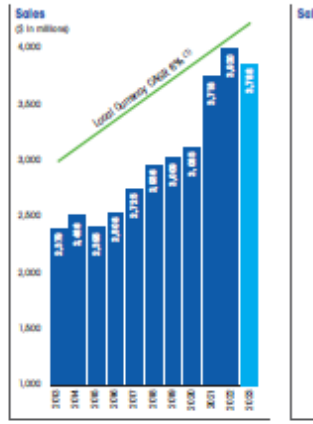
2023 At-a-Glance

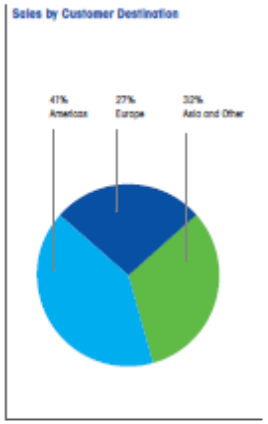
-3%
Local currency sales growth

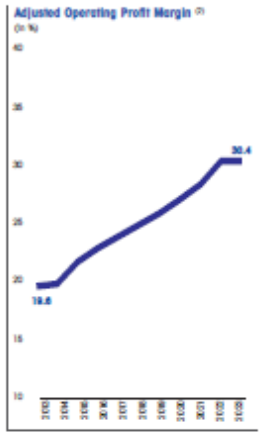
0 basis points
Adjusted operating profit margin expansion

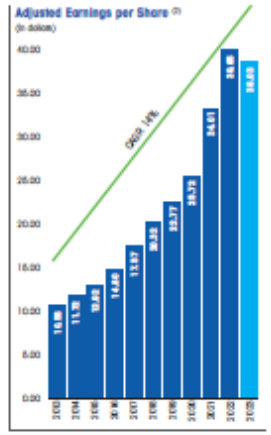
-4%
Adjusted EPS growth

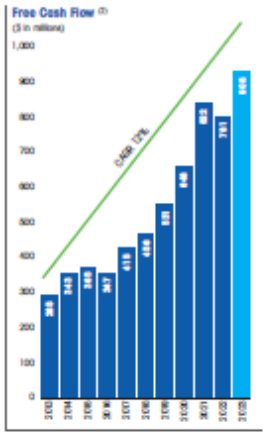
+16%
Free cash flow











(1) CAGR in USD for the period 2013 – 2023 is 5%.
(2) Represents non-GAAP financial measure; a reconciliation to U.S. GAAP metrics is provided in the appendix.

Hub Based Fulfillment Model

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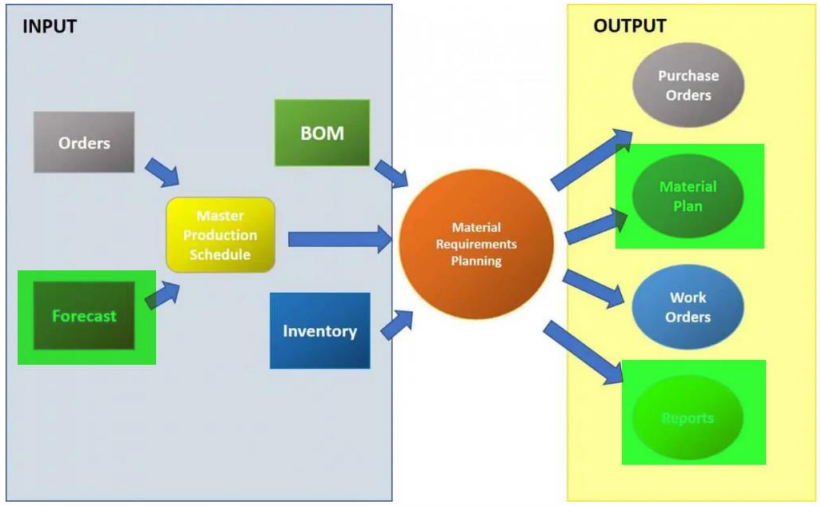
2019: Was our mature global supply chain and extensive Lean practice capable to manage new VUCA challenges?

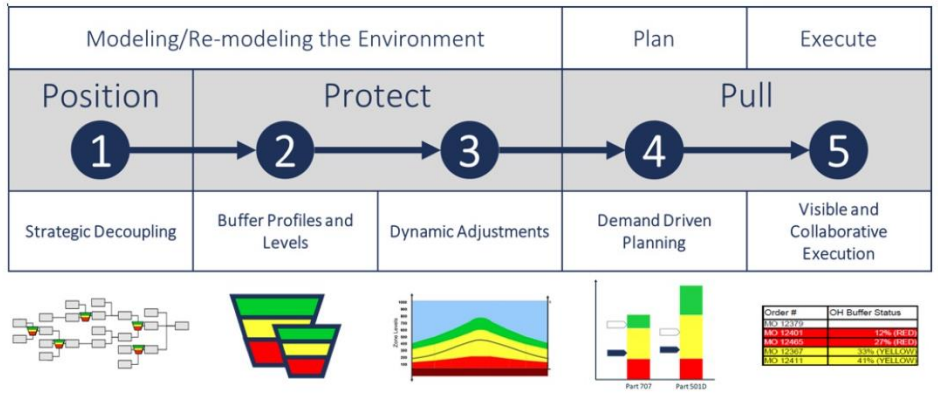
On time Delivery	ITO	Forecast accuracy	Bullwhip effect
➡	⬇	⬇	⬆

Which are the options to improve our planning processes?

Traditional approach – MRP Optimization



Alternative approach - DDMRP



DDMRP Implementation– Pilot

2019: 1st Pilot

Training	Pilot software	Scope	Results
DDPP training	BW4HANA	3 European plants (900 materials) – 6 months	KPIs
- DDMRP training (professor Carol Ptak) - Reading books: DDMRP, DDAE	- Initial idea was to use Excel, but with 900 materials, we need something more automatic: BW4HANA	- Selection of good performing units (1 HUB, 2 PO) - 900 materials (most of them challenging in terms of performance)	- **OTD: + 5 %** - **Sales Order reconfirmation: - 50%** - **Missing parts: - 75%** - **Inventory: - 15%**

2020: 2nd Pilot

Training	Pilot software	Scope	Results
Global training	Replenishment+ demo version	6 global plants (1900 materials) – 6 months	KPIs
- Internal DDMRP training - Each region will train their units	- Interfaces were build up with Robot automation	- 3 plants in Europe, 2 China and 1 in US - 3 HUBS and 3 POs	- **OTD: + 0%** - **Sales Order reconfirmation: NA** - **Missing parts: - 50%** - **Inventory: - 5%**

Results are better than expected → Let's do it !!!

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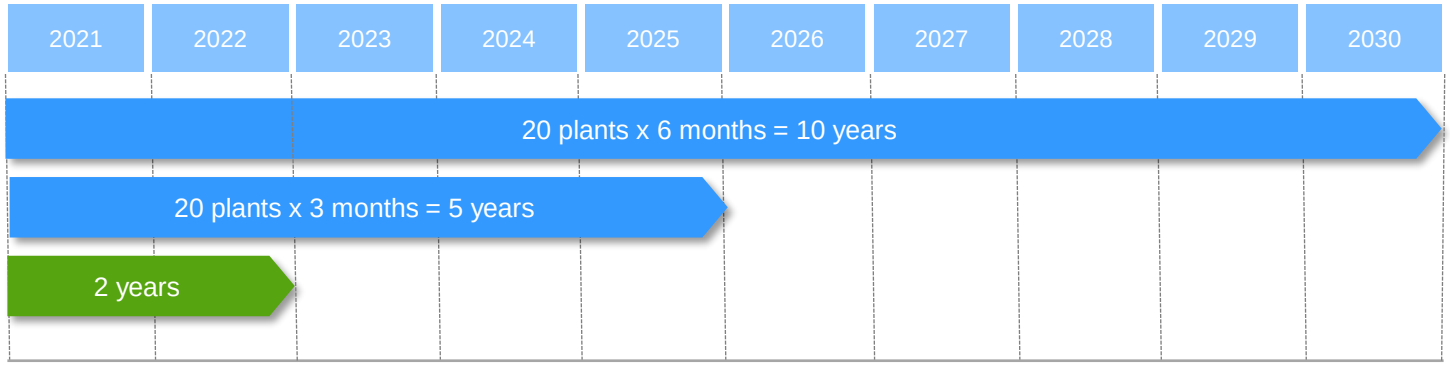
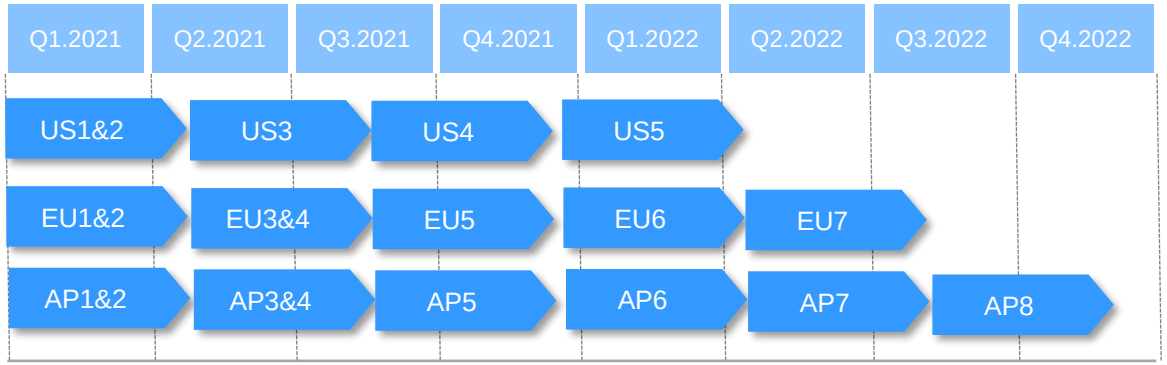
DDMRP Implementation - Timeline

2021: How much time do we need to implement DDMRP in 20 plants and 200k parts?

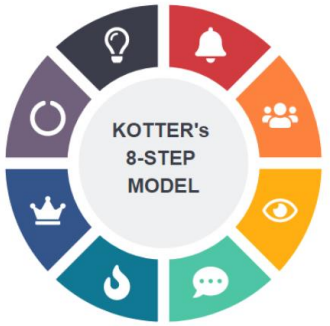


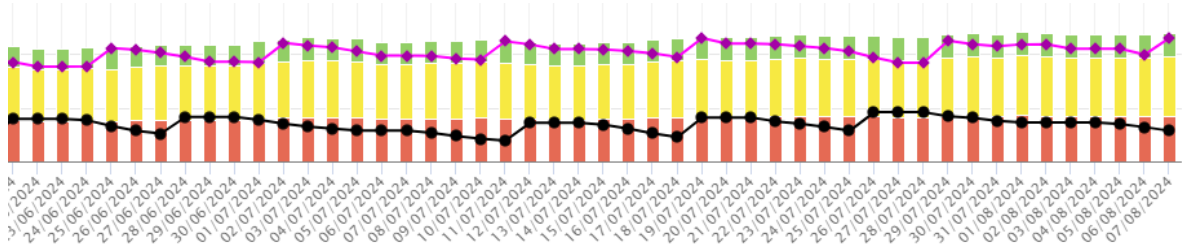
Indeed, we implemented DDMRP only in **2 years** thanks to two main factors:

- Mettler's methodology using John Kotter's 8 step model.
- DDMRP and Intuiflow simplicity and visibility.



INTUIFLOW
BY DEMAND DRIVEN TECHNOLOGIES





DDMRP Implementation – Mettler's methodology

Kotter's 8 step Model in DDMRP implementation

1	Create climate of change	Establish the feeling of urgency of DDMRP implementation.
2		Build up regional teams, share objectives, build up trust.
3		Vision: Global processes , unit ownership .
4	Engage and enable the Organization	Communicate implementation strategy in the 3 regions and units.
5		Empower regional coordinators and power users in units.
6		Create short term wins with DDMRP pilots.
7	Sustain the Change	Promote improvements in DDMRP template.
8		Incorporate local improvements into global standards.




PROs

- Fast implementation.
- Small central team leading DDMRP implementation.
- Low implementation cost.
- Plants perceive this new planning methodology as their project.
- Improvements can come from any of the 3 regions (US, EU, AP).
- Fast improvement in SCM KPIs (both stock availability and stock levels).

CONs

- DDMRP parameters are locally managed which can lead to different processes.
- Some units have decided to have a staggered go live which leads to different implementation speed.
- Change management cannot be managed only locally.

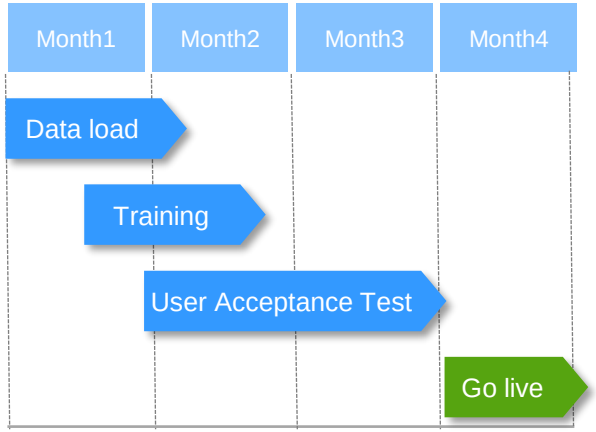
DDMRP Implementation – Mettler's methodology

DDMRP parameters are locally managed.

Common Blue Print

Different implementation speed in units.

2 months of UAT



- 2 months of UAT using daily updated data allows users to be familiar with DDMRP methodology.
- We can compare DDMRP vs MRP results.
- Users enjoy of individual and global visibility.

Change management managed centrally.

Global Involvement

- Before starting the project, we were aware that change management was the most important challenge -> it requires global approach and high effort.

- It requires a strong sponsorship of global **top management.**
- KPIs improvement should be visible and clear for **managers.**
- Kotter's 8 step Model helps to promote changes in **planners.**

DDMRP Implementation – DDMRP & Intuiflow simplicity and visibility

- DDMRP 5 steps can be explained (and understood) in less than 1 hour.

DDMRP Step 2

MRP Calculation

- MOQ, Rounding value
- Periodic lot size

Forecast value for the period (t+i)

$$P(t+i) = (G(t) + i * T(t)) * S(t-L+i)$$

where:

Basic value:

$$G(t) = G(t-1) + T(t-1) + \alpha \left[\frac{V(t)}{S(t-L)} G(t-1) - T(t-1) \right]$$

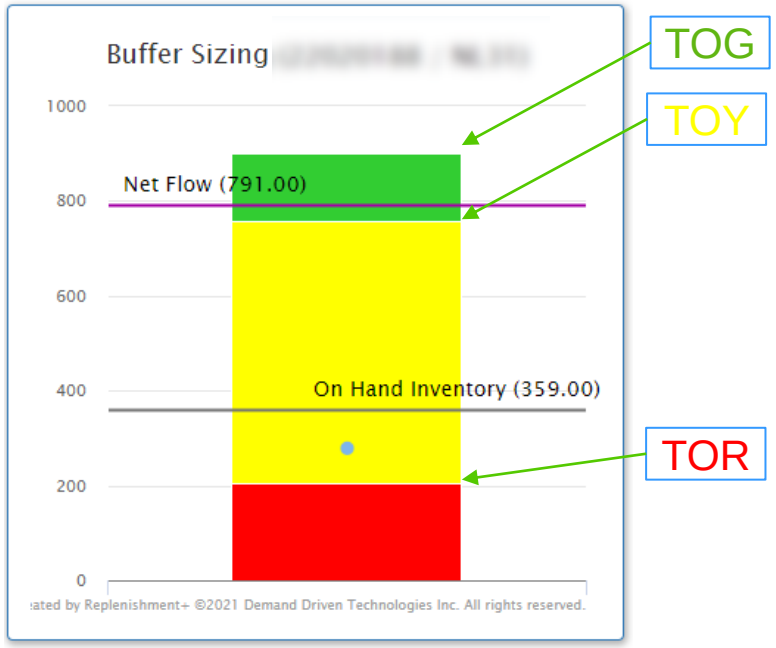
Trend value:

$$T(t) = T(t-1) + \beta \left[G(t) - (G(t-1) + T(t-1)) \right]$$

Seasonal index:

$$S(t) = S(t-L) + \gamma \left[\frac{V(t)}{G(t)} - S(t-L) \right]$$

$$\text{Safety stock} = (Z \times \sqrt{PC/T_1} \times \sigma_D) + (Z \times \sigma_{LT} \times D_{avg})$$



Flow Index is monthly calculated

DDMRP Calculation

MAX
- MOQ, Rounding value
- ADU x Lead time x Lead time factor

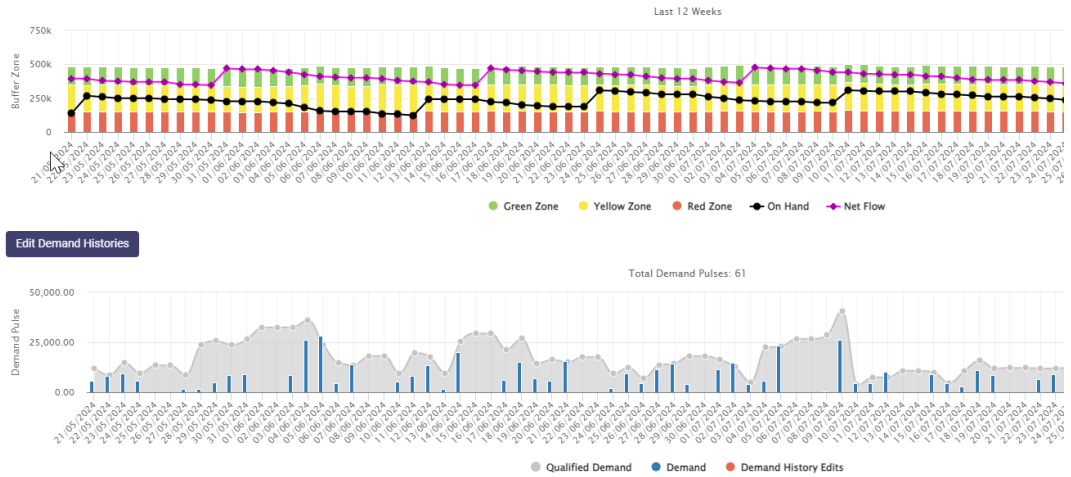
ADU x Lead time

Red base + Red Safety
- Red base = ADU x Lead time x Lead time factor
- Red safety = Red base x Variability factor

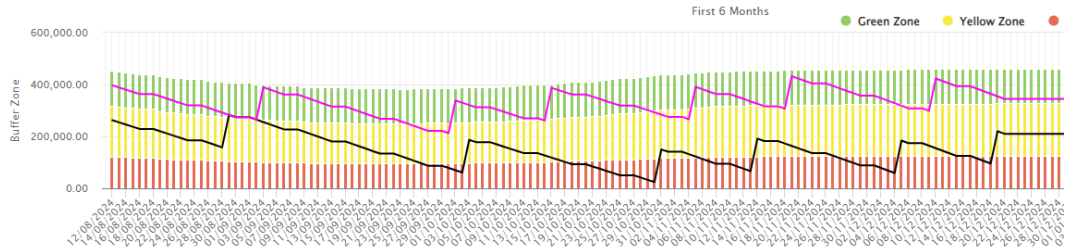
DDMRP Implementation – DDMRP & Intuiflow simplicity and visibility

Intuiflow visibility is extremely high:

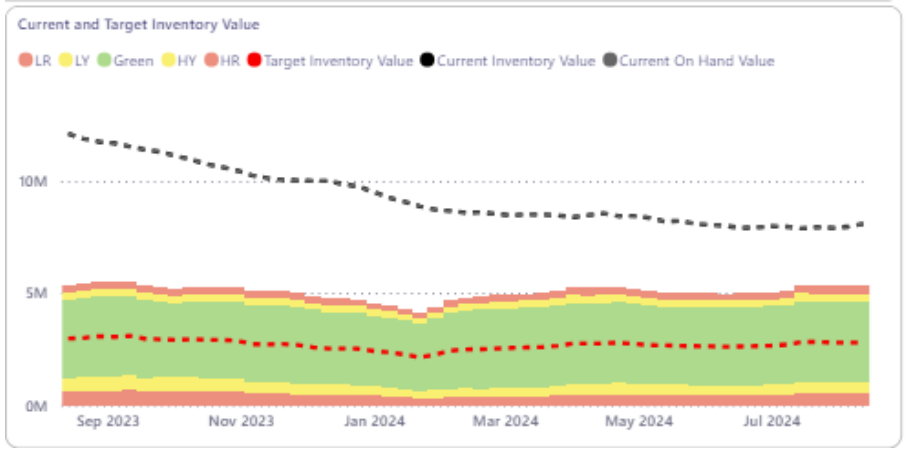
DDMRP - Individual view



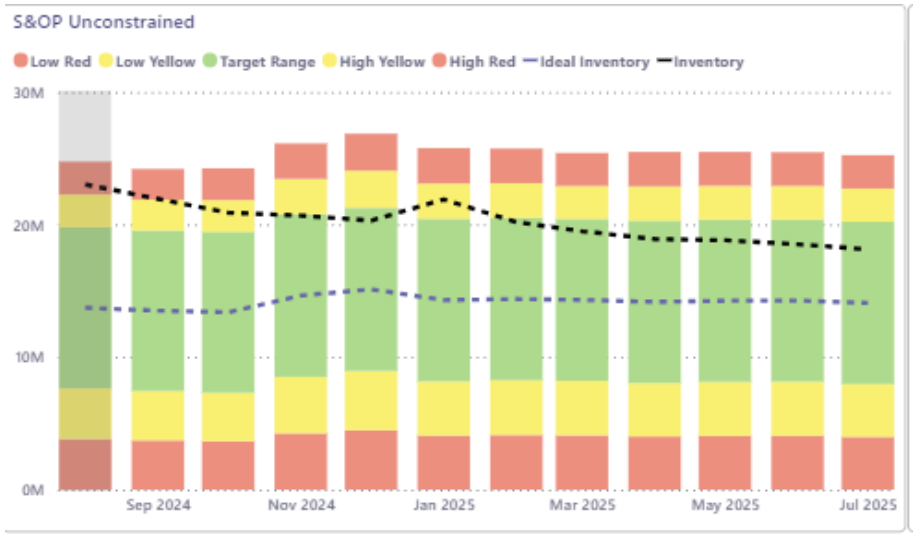
Forecast projection - Individual view



DDMRP – Plant view



Forecast projection - Plant view

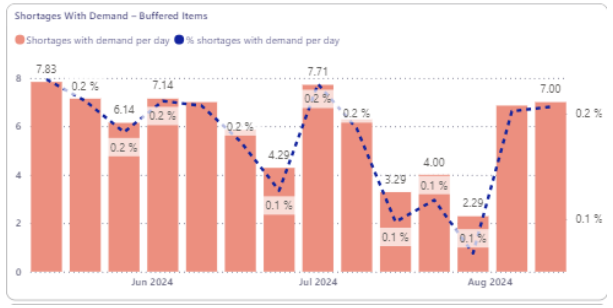


DDMRP Implementation – DDMRP & Intuiflow simplicity and visibility

INTUIFLOW
BY DEMAND DRIVEN TECHNOLOGIES

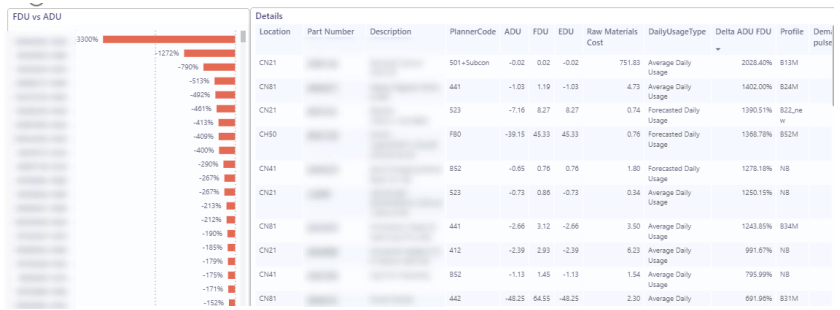
Past period analysis

Shortages



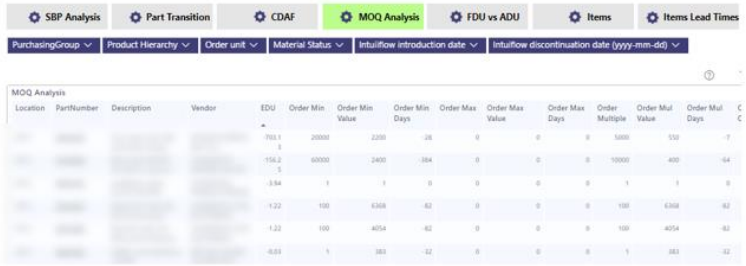
Inventory analysis

FDU vs ADU

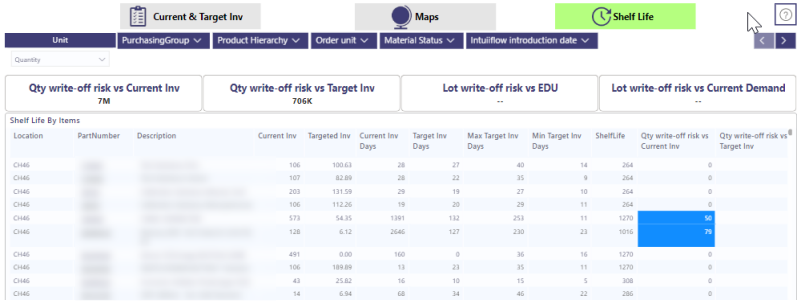


And many more reports

Flow Index - MOQ view



Shelf life risks



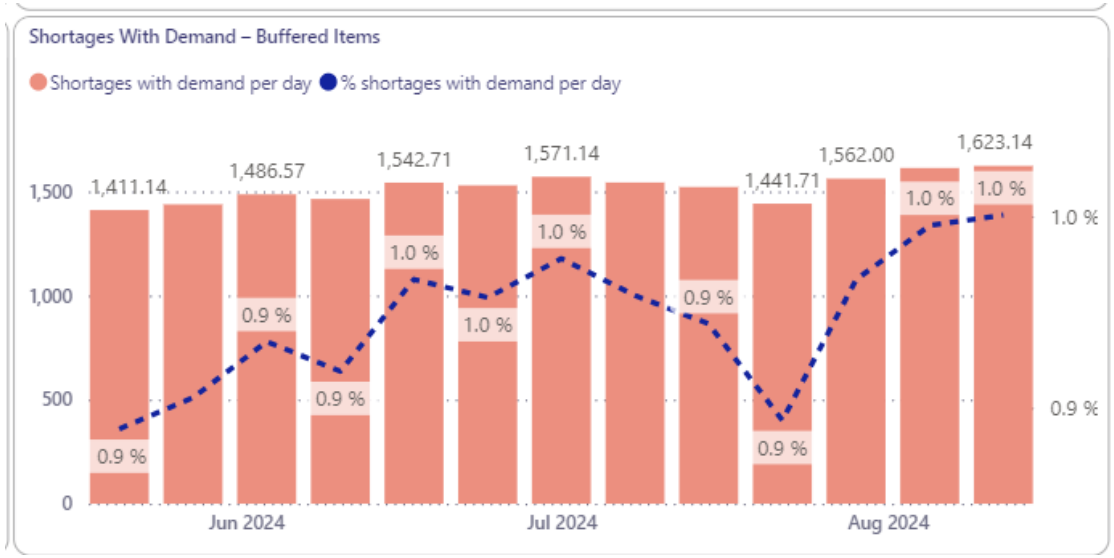
DDMRP Implementation – KPIs

DDMRP – Business Case

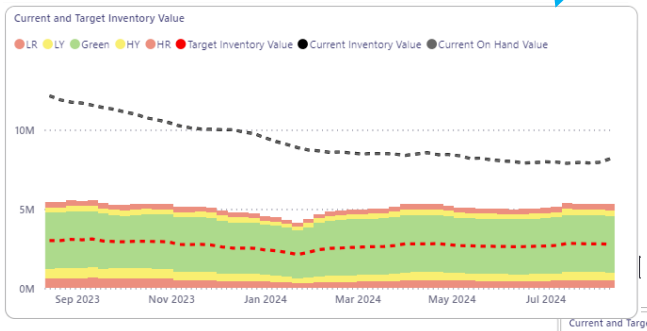
During DDMRP implementation Business Case the following KPI improvements were foreseen:

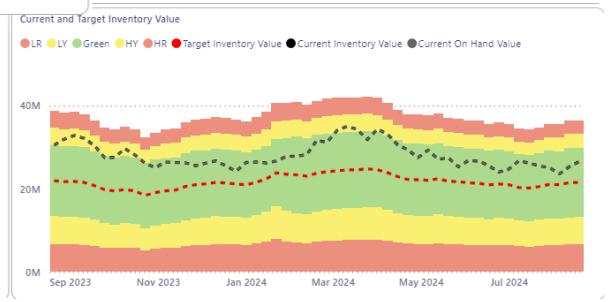
- **Service Level increase.**
- **Inventory carrying cost reduction.**
- Obsolescence scrap reduction.
- Premium expedite freight cost reduction.
- Less planners required.
- Less system developments.

Global stock availability around 99%.



Plant examples





Mettler Toledo annual report 2023

5. *INVENTORIES*

Inventories consisted of the following at December 31:

	2023	2022
Raw materials and parts	$ 180,352	$ 222,170
Work-in-progress	81,181	77,848
Finished goods	124,332	141,676
Total inventory	$ 385,865	$ 441,694

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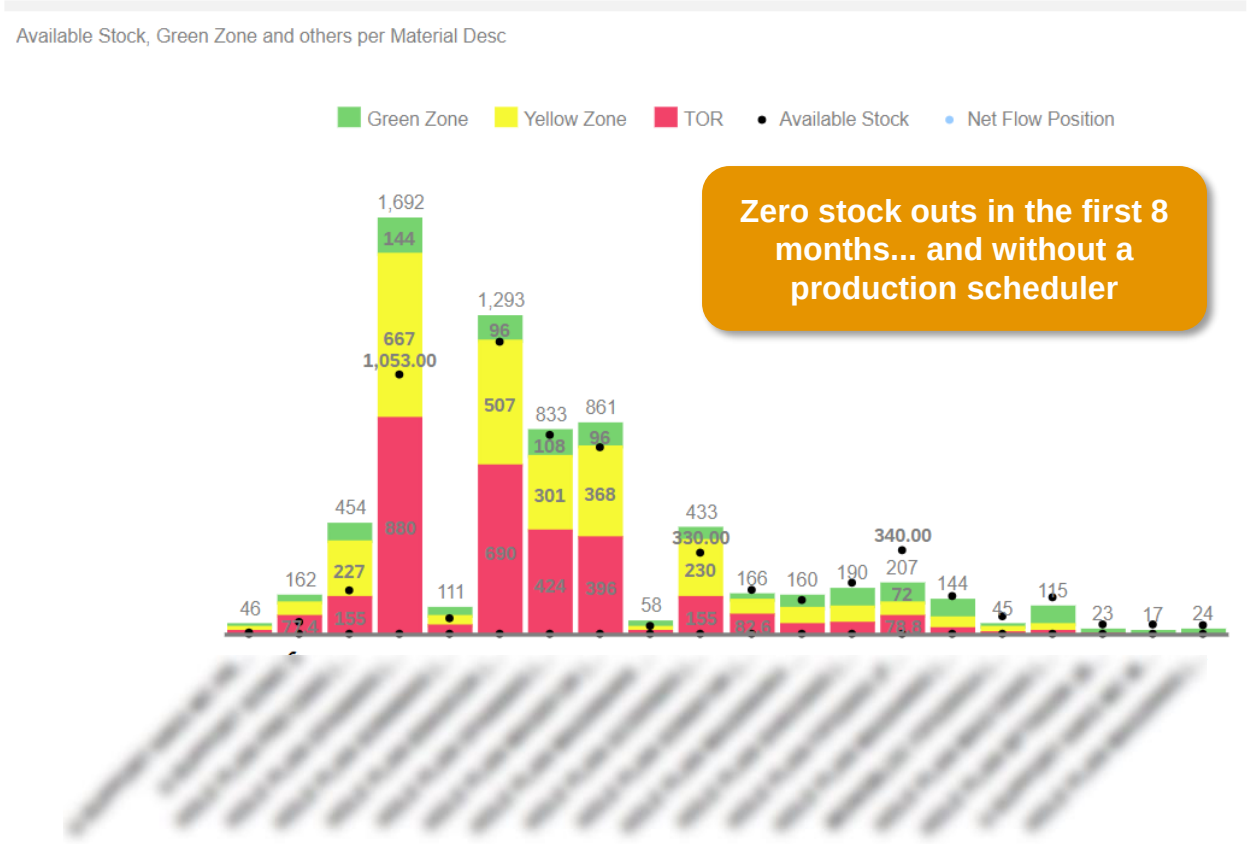
Demand Driven Execution Priorities – Material view

- In one of the DDMRP knowledge company exchange, we visit a factory where production scheduling for **Make-To-Stock Buffered** materials was be done based on Demand Driven execution priority, and production order dates were becoming irrelevant.

$$\textbf{Execution } \% = \frac{Stock}{TOR}$$



Buffer status

DDMRP Update Date 2023-11-13

Data Extract 14.11.2023 03:30:03.0

DDMRP_material

Table Information

	TOR	TOY	TOG	Available Stock	Exe Status
	16.32	32.47	46.47	6.00	36.78%
	77.38	130.18	162.18	49.00	63.33%
	154.50	381.70	453.70	177.00	114.57%
	880.12	1,547.59	1,691.59	1,053.00	119.64%
	39.62	78.85	110.85	64.00	161.52%
	689.79	1,196.99	1,292.99	1,186.00	171.94%
	423.80	724.72	832.72	808.00	190.66%
	396.30	764.70	860.70	758.00	191.27%
	16.99	33.79	57.79	33.00	194.19%
	155.48	385.48	433.48	330.00	212.25%
	82.62	142.14	166.14	179.00	216.66%
	45.15	111.55	159.55	138.00	305.63%
	49.02	117.86	189.86	208.00	424.33%
	78.78	134.72	206.72	340.00	431.58%
	30.02	71.62	143.62	154.00	513.06%
	12.51	33.35	45.35	72.00	575.77%
	18.28	42.92	114.92	149.00	814.92%
	3.40	6.77	22.77	39.00	1,148.41%
	1.33	2.04	17.04	39.00	2,925.73%
	0.00	0.00	24.00	36.00	9,999,999.00%

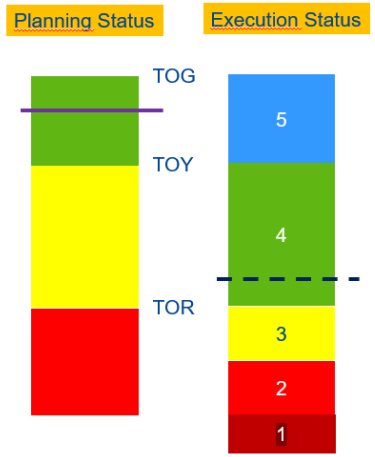
Demand Driven Execution calculation

Demand Driven Execution Priorities – Production Order view

- In order to calculate each priority for Production Orders we need to adapt the formula of Execution Status:

$$\text{Execution Status} = \frac{Stock\ projection\ before\ Prod.Order}{TOR}$$

Date	Order Number	Promise Da...	Qty	Running Balance
11/09/2024			37.000	37.000
16/09/2024	4506357989_000090_0001_U1		-120.000	-83.000
20/09/2024	011009586634_FE	19/09/2024	100.000	17.000
23/09/2024	4506356744_000090_0001_U1		-20.000	-3.000
25/09/2024	011009602153_FE	24/09/2024	100.000	97.000
25/09/2024	011009631695_FE	24/09/2024	100.000	197.000
25/09/2024	011009658852_FE	24/09/2024	100.000	297.000



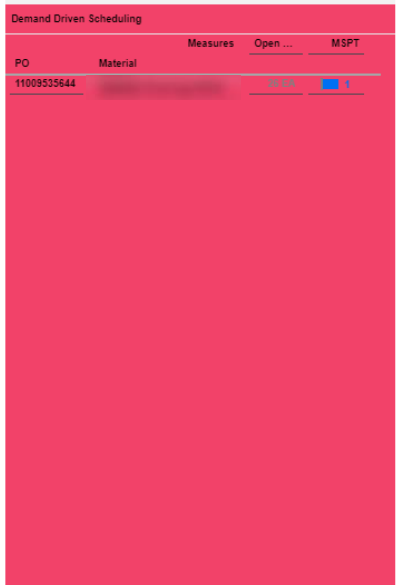
Released-Priority 1 or A
in EA, --
26 EA
Open Qty (EA)
#PO 1
#Material 1

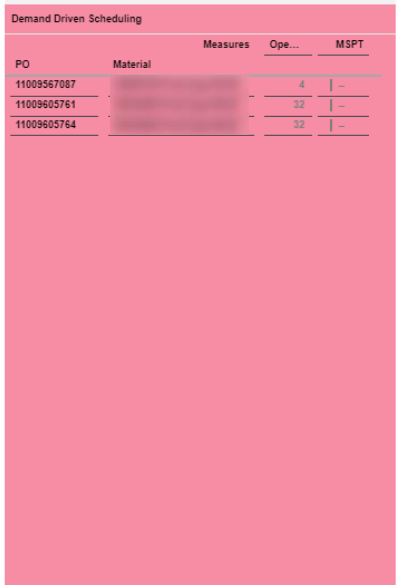
Released-Priority 2
in EA, --
68 EA
Open Qty (EA)
#PO 3
#Material 2

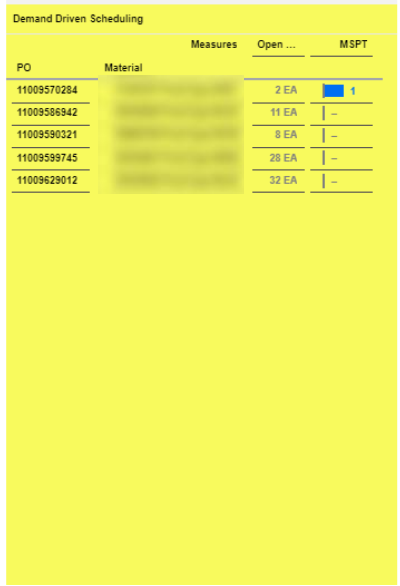
Released-Priority 3
in EA, --
81 EA
Open Qty (EA)
#PO 5
#Material 4

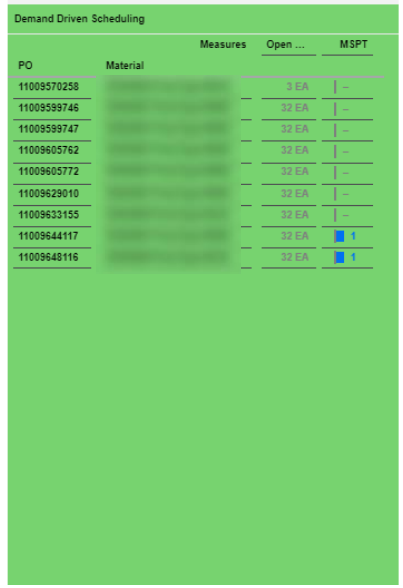
Released-Priority 4
in EA, --
259 EA
Open Qty (EA)
#PO 9
#Material 3

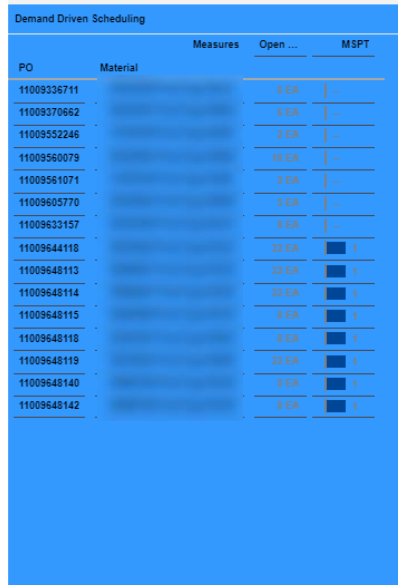
Released-Priority 5 or Others
in EA, --
205 EA
Open Qty (EA)
#PO 15
#Material 9









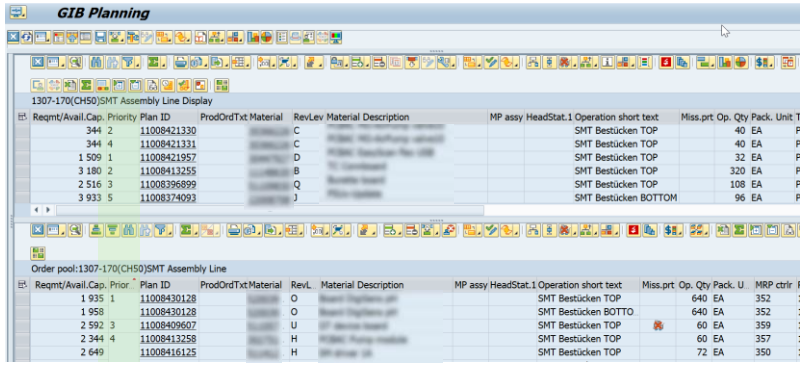


We will place execution status inside the buffer and determine its corresponding priority

Demand Driven Execution Priorities

Demand Driven Execution priorities will be used in several processes

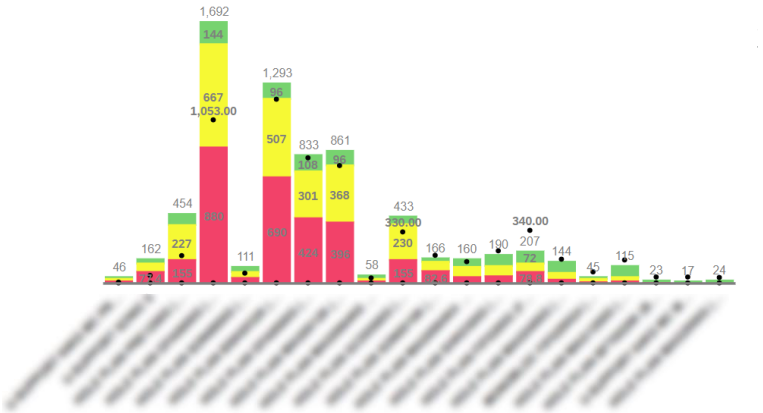
Dispatching production orders



Daily Shop floor meeting

Work center production priorities

Scheduling at material level



Agenda

1. Mettler Toledo overview
2. DDMRP Pilots
3. DDMRP implementation
4. Post DDMRP: Demand Driven Execution Priorities
5. Post DDMRP: Auto Pilot
6. Conclusions
7. QA

Auto Pilot

- In another DDMRP knowledge company exchange, we share our internal lead times and variability coefficients during DDMRP step 2 (**Buffer Profile and Levels**). Every 3 months we run Smart Buffer Profiler to determine the correct buffer profile. We have 5 different levels in Lead time coefficients and 4 levels in variability coefficients.

Lead time coefficient

Buy

Id	Description	From	To	Red Base %
1	ShortLT	1	15	80
2	ShortLT	16	30	60
3	MediumLT	31	60	40
4	MediumLT	61	90	25
5	LongLT	91	∞	20

Variability coefficient

Buy

Default	Id	Description	From CoV	To CoV	Red Zone Safety
○	1		1	150	30
○	2		151	250	60
◉	3		251	500	75
○	4		501	∞	150

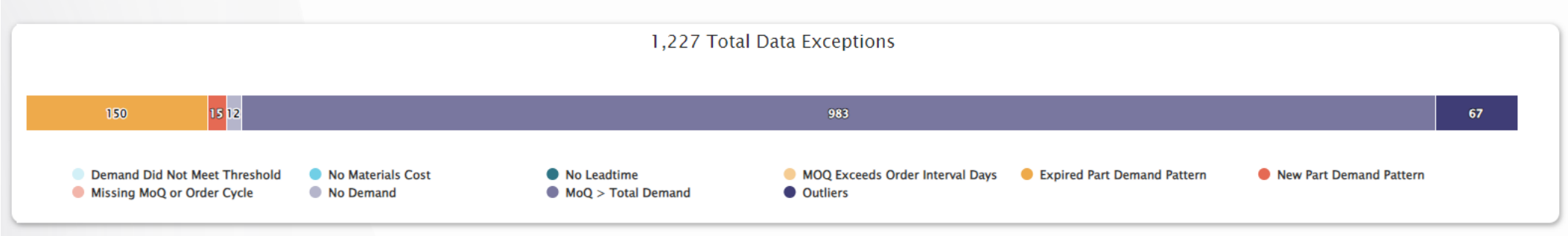
But are these the correct ranges, are them the correct coefficients? Are the other company ones, better? Do we balance correctly Service level and Inventory Turnovers?

With **Auto Pilot** we have the first AI/ML tool capable to link the buffer size and different coefficients, to the desired service level…. and the system will decide for us which is the best buffer.

Inspired by Shazam

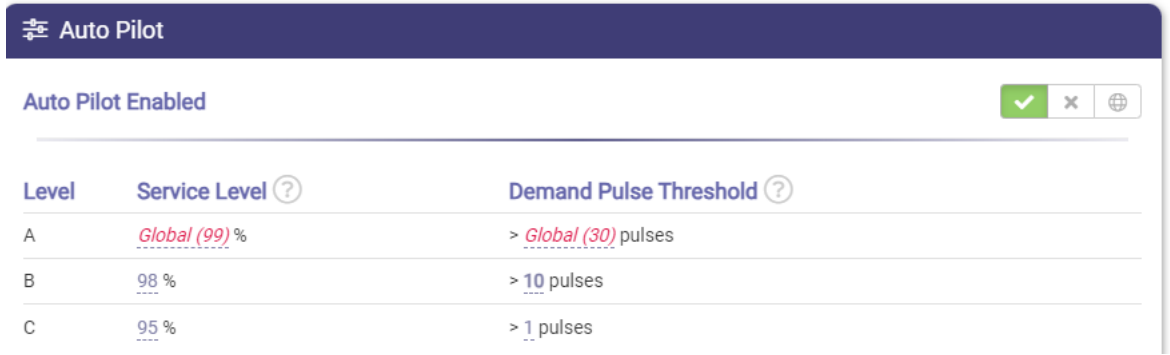
Auto Pilot

- If a material fulfills std supply chain patterns and passes ‘data exceptions’:



It will be candidate to enter in Auto Pilot.

Depending in the number of days of consumption per year we will determine a desired service level.



Auto Pilot

Agenda

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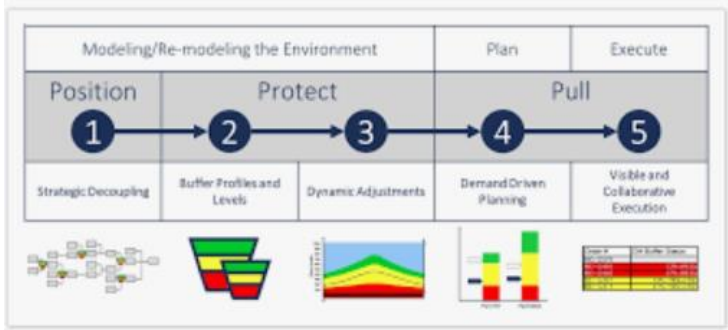
After implementing DDMRP in Mettler Toledo we can have the following conclusions

Fast implementation

- It can be implemented in months, with a small central team, global blue print but empowering units.
- It requires an important change management effort.

SCM KPIs

- DDMRP implementation improves stock availability and ensures correct stock levels.
- It reduces supply chain disruptions by maximizing flows.



Visibility

- DDMRP is easy, transparent, understandable and intuitive, providing a better way of planning materials.
- This visibility appears first in planning, but it is good to use it in other areas.

Post DDMRP

- After Implementing DDMRP, DDAE proposes a clear path to improve mid-and-long term planning.
- Demand Driven concepts should be expanded in and outside MT.