



Moen's Story: How They Increased Service Levels & Reduced
Supply Outages by Implementing Discrete Manufacturing
Functionality Within Standard SAP ECC

David Carroll, Thought Leader, Reveal
Session ID #556932

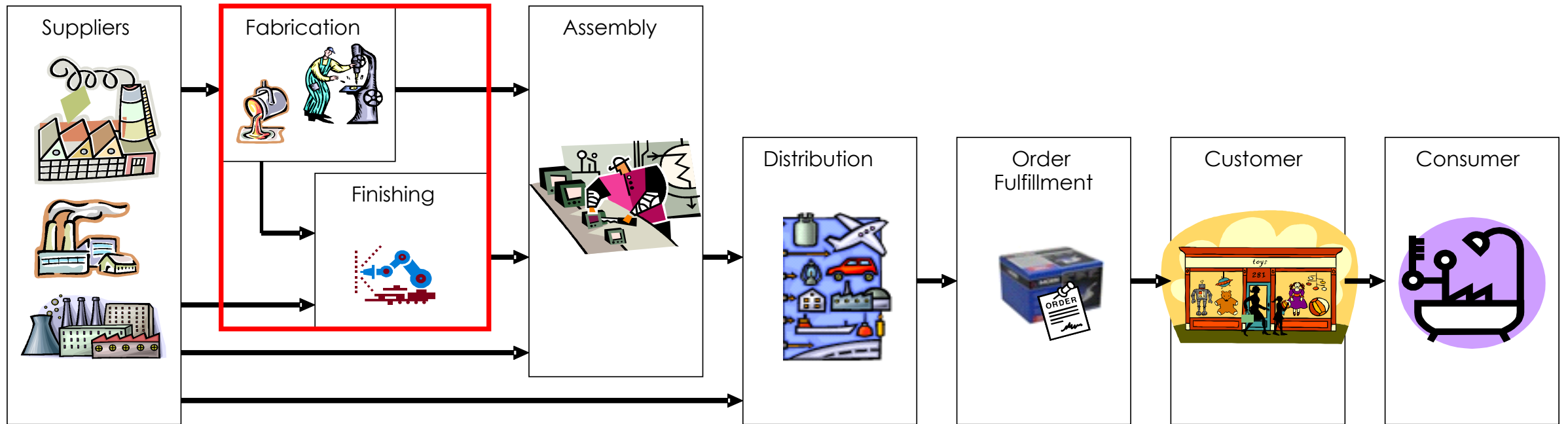
Key Outcomes/Objectives

- Gain insight into Moen's challenges from using custom planning tools and processes
- See first hand how the use of standard SAP is driving results
- Understand how standard SAP can help measure performance
- Learn how standardization and process improvement has transformed Moen's business

Agenda

- Moen Site & Supply Chain Overview
- Site & Supply Chain Challenges
- Discrete Conversion – Technical Solutions
- Wrap-up

Moen Site & Supply Chain Overview



- Started production in Sanford in 1973 under the Stanadyne name
- 350,000 square-foot facility, expanded 7 times
- Over 400 associates operating 5/24
- High complexity under one roof
 - Over 4,000 individual component parts
 - Over 400,000 parts shipped every day

Sanford Facility Manufacturing Process

FUNCTIONAL

- Injection Molding
- CNC & Automatic Screw Machining
- Automated Assembly

FINISHING

- Robotic Texturing
- Electro Plating
- Color Powder Coating
- Physical Vapor Deposition



Functional Breakdown

- 22 Molding Machines (80T-300T)
- 25 active resins
- 49 machines across 4 technologies:
 - Hydromat
 - Davenport
 - Multi-spindle
 - CNC
- 5 Cartridge Assembly processes
- 130M units annually



Sanford Facility Manufacturing Process (cont.)

FUNCTIONAL

- Injection Molding
- CNC & Automatic Screw Machining
- Automated Assembly

FINISHING

- Robotic Texturing
- Electro Plating
- Color Powder Coating
- Physical Vapor Deposition



Finishing Breakdown

- 20+ finishes
- 5 Plating Machines
- 1 Powder Coating System
- 6 PVD Chambers
- 9 Texturing robots
- High Mix/Low Volume
- 19M units annually



Sanford Facility Manufacturing Process (cont.)

FUNCTIONAL

- Injection Molding
- CNC & Automatic Screw Machining
- Automated Assembly

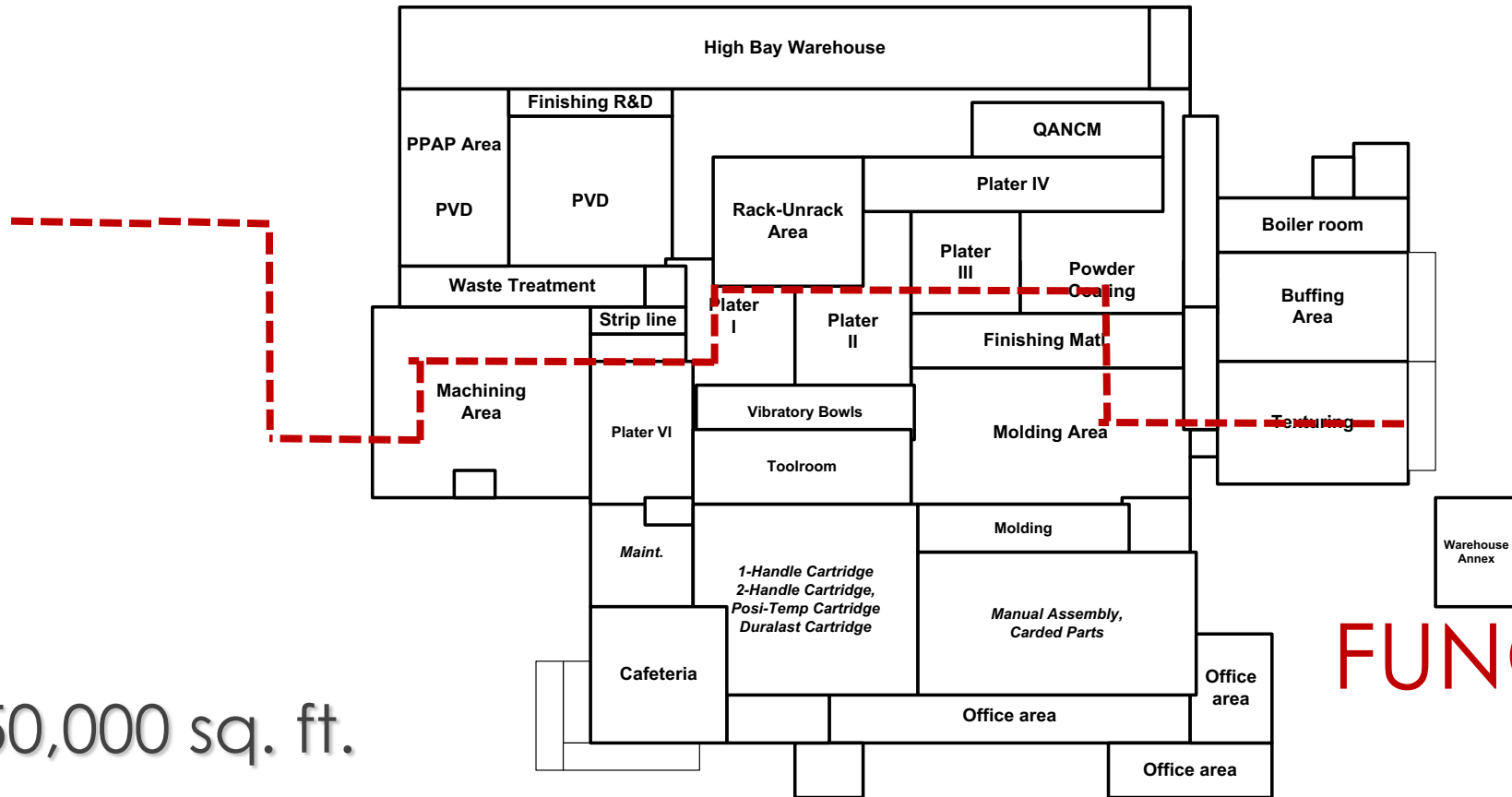
FINISHING

- Robotic Texturing
- Electro Plating
- Color Powder Coating
- Physical Vapor Deposition



Sanford Facility

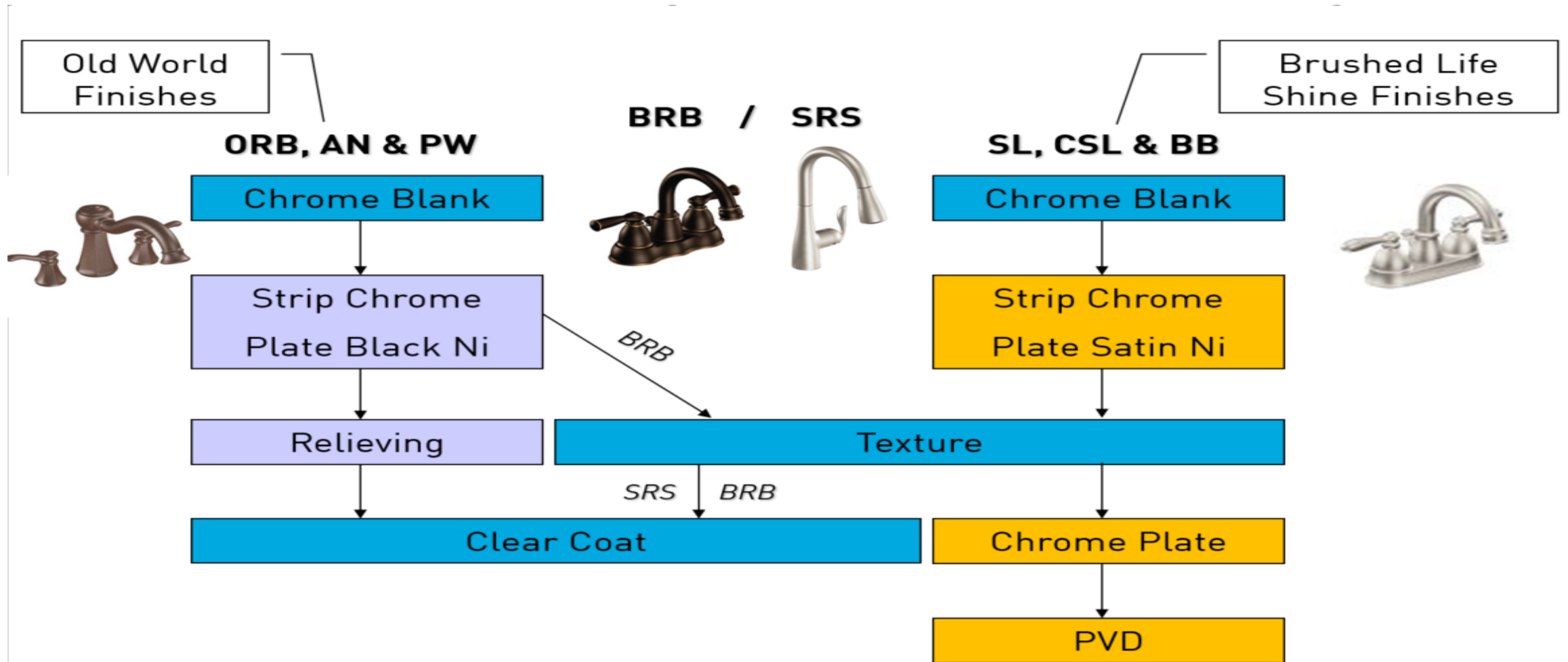
FINISHING



FUNCTIONAL

■ 350,000 sq. ft.

Finishing Processes



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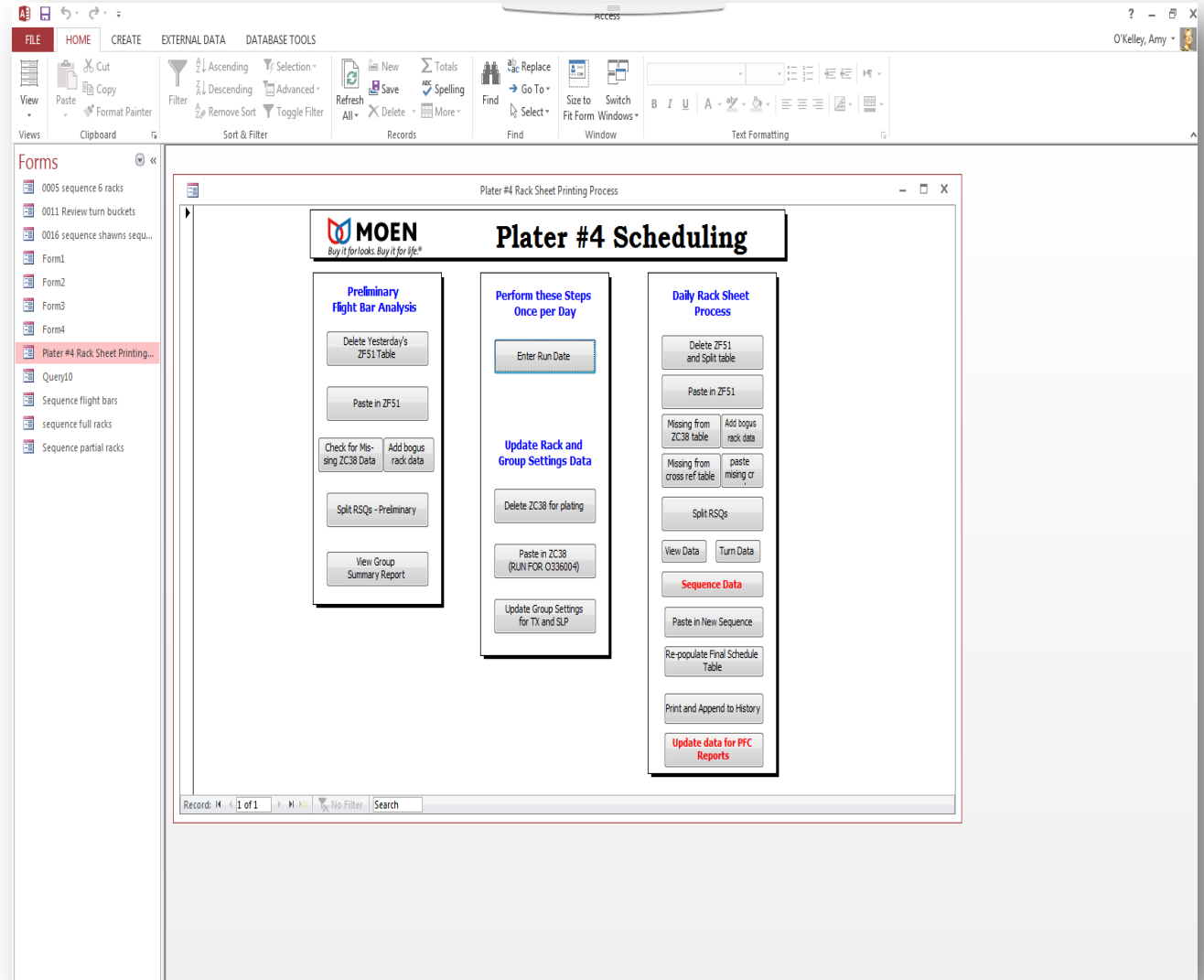
Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1	2	3												
2		4													
3															
4		Material	Descriptor	Blank	Recipe	Rack Number	1/25/2012	Available Racks	Pcs/R	# of racks	Total Racks	Total FB			
5		103623SN	SPOUT HL	112002	4G04R	PLT-1690	396	47	66	6			6	1	
6															
7															
8		133238SN	CENTER F	133237	4G05R	PLT-1322	0	1	88	0					
9		103226SN	HNDL HUE	103225	4G05R	PLT-5245	0	1	27	0			0	0	
10															
11															
12		118466SN	BALL, SHV	121141	4G06R	PLT-5142	240	18	40	6			6	1	
13															
14															
15		138988SNP	SPOUT, S	138988	4G23	PLT-6460	1,080	36	10	108					
16		147316SNP	3 HOLE E	147316	4G23	PLT-6501	1,512	42	18	84					
17		141020SNP	SHOWER	141020	4G23	PLT-6375	1,920	38	32	60					
18		128237SNP	ESCUTCH, L	128237	4G23	PLT-1039	300	15	12	25					
19		150309SNP	HANDLE, L	150309	4G23	PLT-6461	504	20	14	36					
20		147316SNP	3 HOLE E	147316	4G23	PLT-6501	648	42	18	36					
21		139976SNP	BENT LIFT	139976	4G23	PLT-1227	540	24	30	18					
22		154183SNP	CALDWEL	154183	4G23	PLT-6498	480	24	16	30					
23		154246SNP	CALDWEL	154246	4G23	PLT-6498	480	24	16	30					
24		147289SNP	HDL BANE	147289	4G23	PLT-6386	432	12	18	24					
25		141738SNP	AERATOR	102097	4G23	PLT-1556	1,680	29	140	12					
26		100749SNP	HNDL T/S	100749	4G23	PLT-5349	192	6	16	12					
27		130031SNP	SPOUT RT	130045	4G23	PLT-6238	96	12	8	12					
28		139976SNP	LIFT ROD	139976	4G23	PLT-1227	330	24	30	11					
29													498	83	
30															
31		130031NP	SPOUT, R	130045	4G31	PLT-6238	16	12	8	2					
32		121344NP	SHELL, TL	121344	4G31	PLT-1235	16	11	8	2					
33		142972NP	SPOUT, V	142972NM	4G31	PLT-6407	24	2	12	2					
34													6	1	
35															
36		147711NP	ESCUTCH	147711	4G32	PLT-6467	198	6	18	11					
37		155952NP	ESCUTCH	128967NM	4G32	PLT-6227	18	6	18	1					
38													12	2	
39															
40		147898NP	ESCUTCH	147898	4G34	PLT-4850	216	102	18	12					

Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning (cont.)



Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning (cont.)

H1019

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Short Cut Keys & Reminders		Ctrl Q - Jumps Down 36 Flight Bars for Rack Turns			Schedule only Raw SN on Flight Bars 1 though 9 for Acid Activator		Raw Group Setting cannot have Dummy Flight Bars		Remember to update SAP with any changes made in quantity, etc...		Ctrl E - Jumps Up 36 Flight Bars for Rack Turns			
1	Flight Bar #	Group	PN	Blank	Rshk Qty	Rack Numb	Schedul Rack	Posf	Tot Rac	Description	Turn	Flight-t	F-b	Wax	
2															
3															
4	1	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	1	1	
5															
6	6												1	1	
7													1	1	
8													2	1	
9	2	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	2	1	
10													2	1	
11	6												2	1	
12													3	1	
13													3	1	
14	3	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	3	1	
15													3	1	
16	6												3	1	
17													4	1	
18	4	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	4	1	
19													4	1	
20	6												4	1	
21													5	1	
22	5	4G23	138988SN	138988		96	PLT-6522	6	16	24 SPOUT, SRS	4	11	5	1	
23													5	1	
24	6												5	1	
25													6	1	
26	6	4G23	138988SN	138988		96	PLT-6522	6	16	24 SPOUT, SRS	4	11	6	1	
27													6	1	
28	6												6	1	
29													7	1	
30	7	4G23	138988SN	138988		96	PLT-6522	6	16	24 SPOUT, SRS	4	11	7	1	
31													7	1	
32													7	1	
33	6												7	1	
34													8	1	
35	8	4G23	154183SNP	154183		96	PLT-6498	6	16	18 CALDWELL CS HANDLE, COLD	4	12	8	1	
36													8	1	
37	6												8	1	
38													9	1	
39	9	4G23	154183SNP	154183		96	PLT-6498	6	16	18 CALDWELL CS HANDLE, COLD	4	12	9	1	
40													9	1	
41	6												9	1	
42													10	1	
43	10	4G23	154183SNP	154183		96	PLT-6498	6	16	18 CALDWELL CS HANDLE, COLD	4	12	10	1	
44													10	1	
45	6												10	1	
46													11	1	
47													11	1	
48	11	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	11	1	
49													11	1	
50	6												11	1	
51													12	1	
52	12	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	12	1	
53													12	1	
54	6												12	1	
55													13	1	
56	13	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	13	1	
57													13	1	

Sheet37 Run Schedule Download test parts kanban

Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning (cont.)

H1019

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
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1	Flight Bar #	Group	PN	Blank	Rshft Qty	Rack Num	Schedul Rack	Post	Tot Rac	Description	Turn	Flight-t	F-b	Way	
2	1	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	1	1	
3	6												1	1	
4	2	4G23	173892SN	173892		48	PLT-6531	6	8	42 SPOUT TUBULAR, SS,	4	16	2	1	
5	6												2	1	
6	3	4G23	173892SN	173892		48	PLT-6531				4	16	3	1	
7	6												3	1	
8	4	4G23	173892SN	173892		48	PLT-6531				4	16	4	1	
9	6												4	1	
10	5	4G23	138988SN	138988		96	PLT-6522				4	11	5	1	
11	6												5	1	
12	6	4G23	138988SN	138988		96	PLT-6522				4	11	6	1	
13	6												6	1	
14	7	4G23	138988SN	138988		96	PLT-6522				4	11	7	1	
15	6												7	1	
16	8	4G23	154183SNP	154183		96	PLT-6498		16	18 CALDWELL CS HANDLE, COLD	4	12	8	1	
17	6												8	1	
18	9	4G23	154183SNP	154183		96	PLT-6498	6	16	18 CALDWELL CS HANDLE, COLD	4	12	9	1	
19	6												9	1	
20	10	4G23	154183SNP	154183		96	PLT-6498	6	16	18 CALDWELL CS HANDLE, COLD	4	12	10	1	
21	6												10	1	
22	11	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	11	1	
23	6												11	1	
24	12	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	12	1	
25	6												12	1	
26	13	4G23	173891SNP	173891		48	PLT-6521	6	8	80 SPOUT TUBULAR, SS,	4	34	13	1	
27	6												13	1	

5 – 6 hour daily scheduling process

Sheet37 Run Schedule Download test parts kanban

Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning
- Lack of shop floor control (cont.)
- Excess WIP inventory



Sanford Facility Challenges (cont.)

- Variation in planning processes
 - Use of custom tools
 - Nonexistent capacity planning
- Lack of shop floor control
- Excess WIP inventory
- Poor execution → Poor service (cont.)
- Data outside of SAP (relevant)

A	B	C	D	E
Root Rack	Total R	Racks Avail	Pcs Per R	Plater 1
PLT-1554	26	26	88	-
PLT-1746	7	7	130	-
PLT-6296	3	3	44	1
PLT-1238	13	13	120	15
PLT-5226	34	34	88	29
PLT-1505	9	9	66	39
PLT-5049	7	7	600	47
PLT-1022	15	15	50	74
PLT-3002	8	8	40	75
PLT-1718	17	16	48	80
PLT-6049	21	21	120	81
PLT-1656	10	10	47	102
PLT-6227	12	12	16	105
PLT-1593	13	13	80	105
PLT-1320	4	4	40	129
PLT-3007	10	10	66	173
PLT-6463	7	7	168	185
PLT-1831	15	15	120	194
PLT-1551	19	19	67	207
PLT-4884	7	7	28	248
PLT-5240	5	5	24	259
PLT-3020	9	9	18	269
PLT-5206	5	5	130	270
PLT-3019	3	3	18	306
PLT-1394	12	12	8	836
PLT-1556	36	36	140	975
PLT-1659	29	29	120	1,039
PLT-1553	90	90	88	1,324
PLT-1719	27	27	88	1,540
PLT-1690	58	58	66	1,919
PLT-1684	184	184	18	8,169
PLT-4850	108	108	18	11,686

Supply Chain Challenges

- Unstable forecast – “Demand Bubble”
- Component shortages
- Non-executable production plans and schedules
- Poor reliability and execution leading to poor service
- Supply chain silos

E2E Supply Chain Pilot
“Creation of executable MPS”



End-to-End Supply Chain Journey

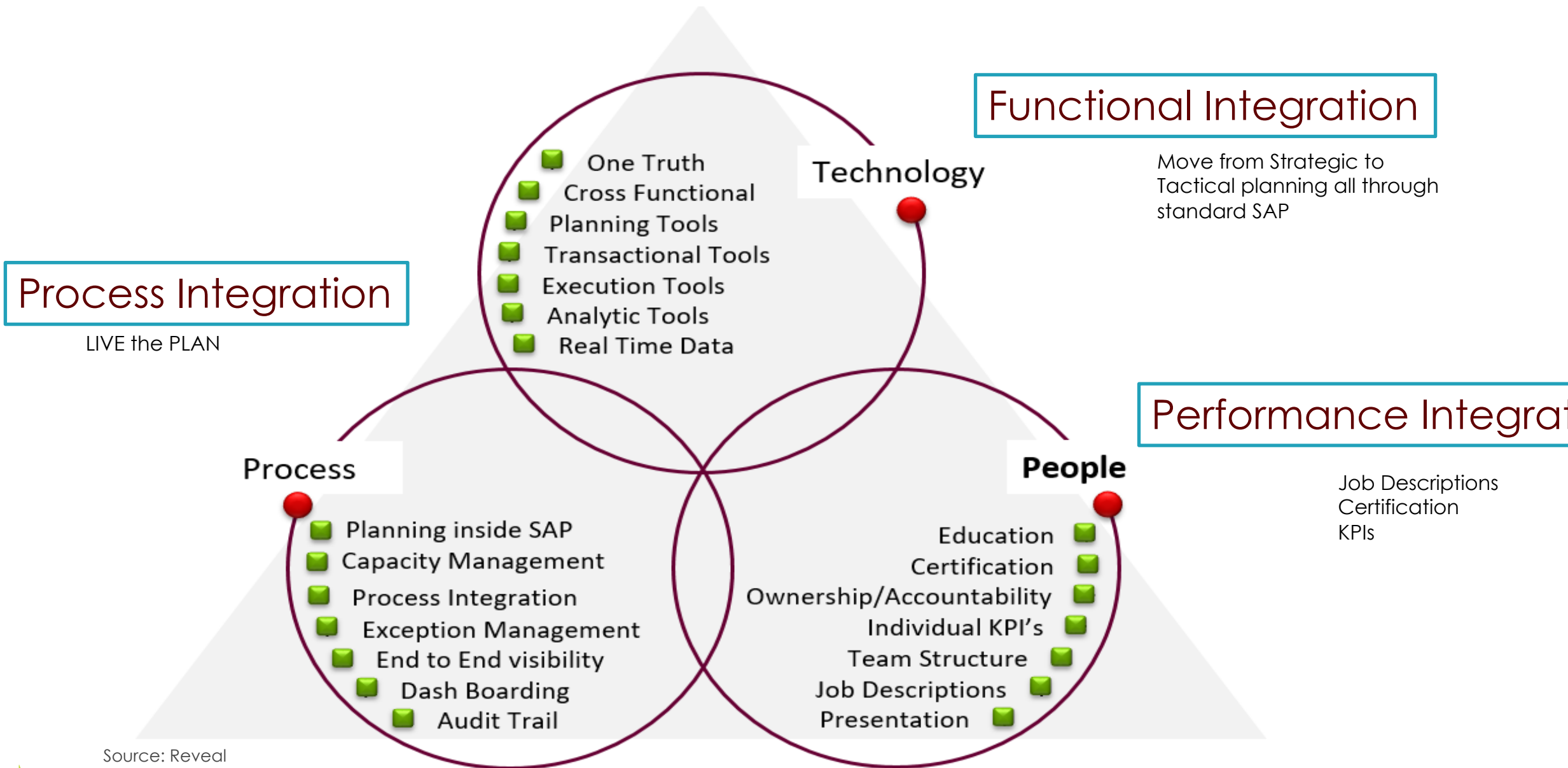
- Improve service levels and reduce costs with systemic, and sustainable fixes
- Improve the effectiveness of our inventory investments
- Enhance the global E2E planning capabilities
- Create business value
- Make SAP one system of record



oVo® Methodology

- Exception Monitoring & Optimization
- Discrete Manufacturing Conversion

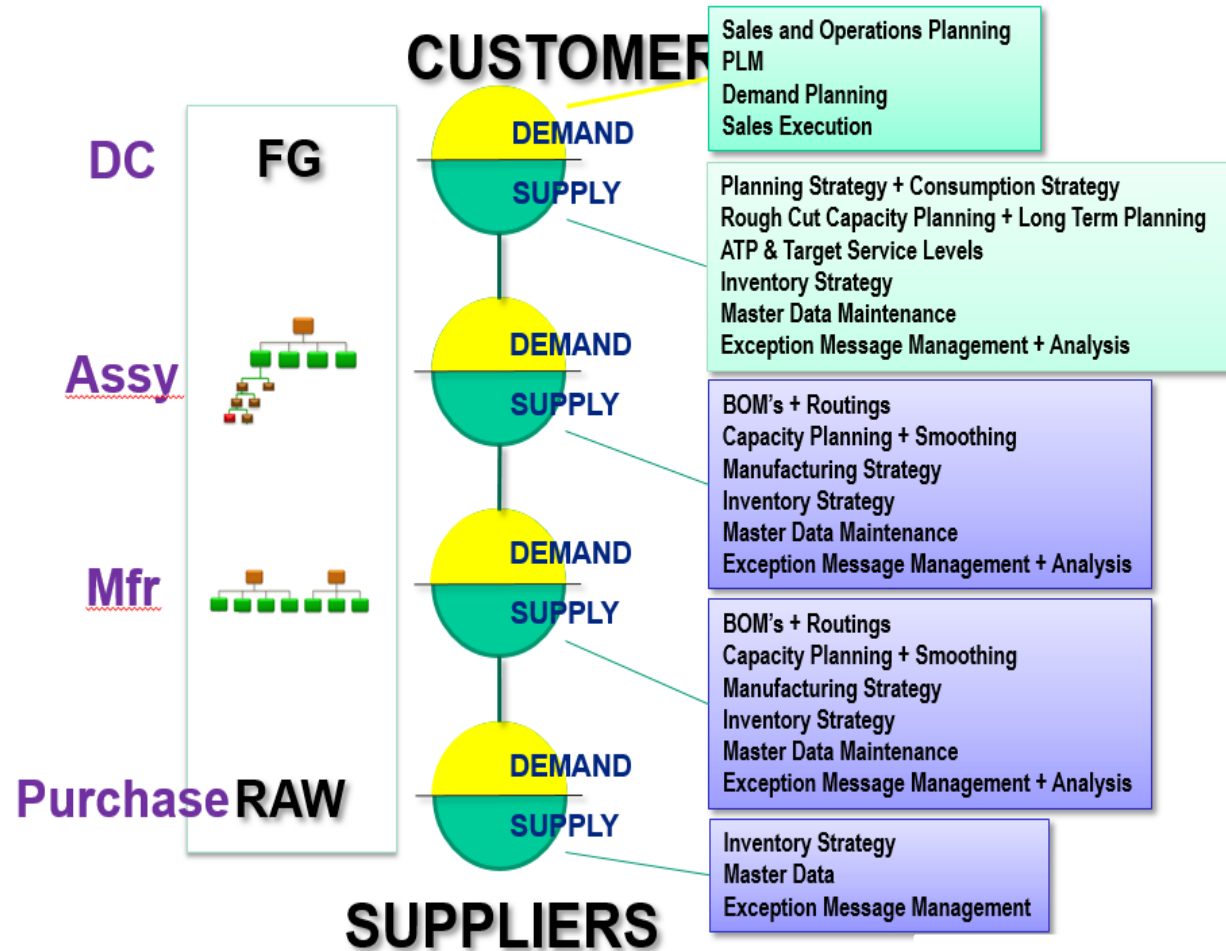
People, Process, and Technology



Source: Reveal

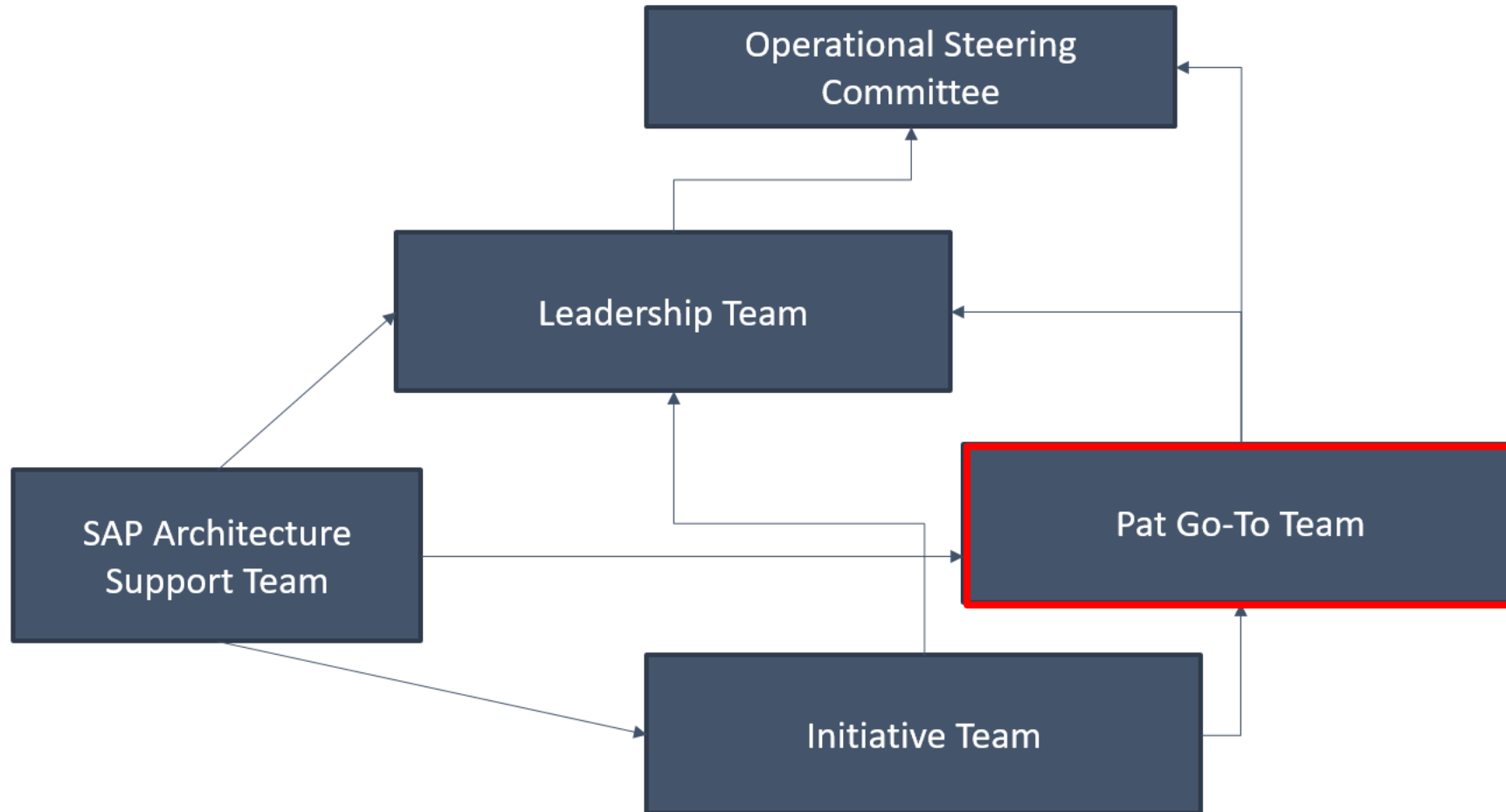
Integrate Supply Chain Functions

Supply Chain Integration

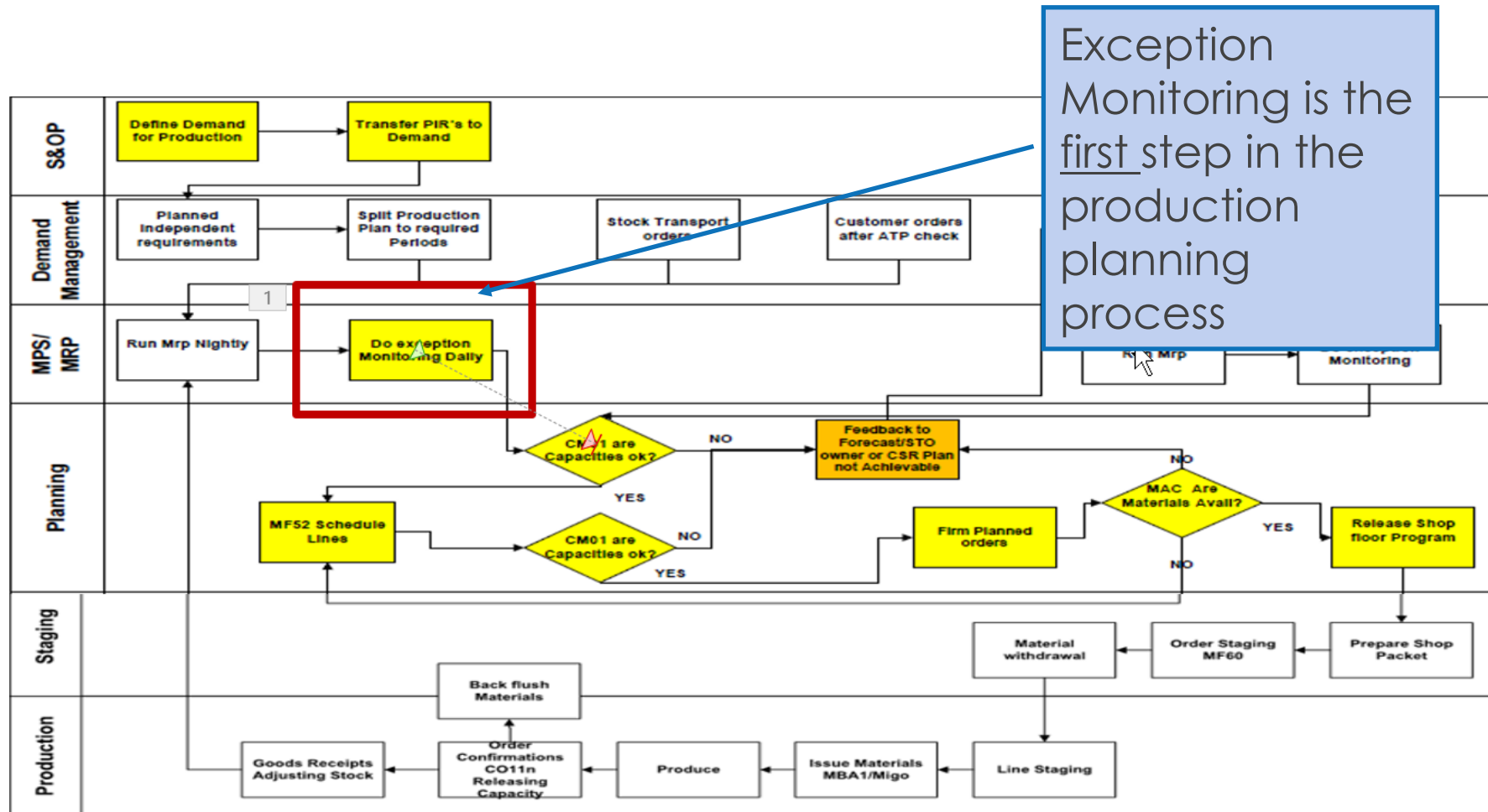


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oVo® Initiative Organization Structure



Supply Chain Process: Production Planning



Agenda

- Moen Site & Supply Chain Overview
- Site & Supply Chain Challenges
- Discrete Conversion – Technical Solutions
- Wrap-up

Key Project Objectives

- Make SAP one system of record
- All planning-related data in SAP
- Use solutions we already own
- Deliver a constraint-free, executable production schedule
- Assign ownership and drive accountability

Planning Constraints

- Component availability
- Capacity availability
 - Machine
 - Labor
- Finishing areas
 - Rack availability
 - Recipes
- Other areas
 - Setter availability
 - Set up optimization

Master Data

- Clean slate
 - Create new master data
- Work centers
 - Create new production work centers
 - Rack (key constraint) will be managed as work center in SAP
- Routings
 - Create new routings with all key operations represented
 - All routing times will be trued up for effective system scheduling
 - Additional key planning data like setup time, pieces per rack, setup optimization data will be added to routings
- Ownership commitment
 - Engineering and Planning will own data maintenance

Planning Scenario Example



Planning Scenario Example



Material – ABC



Can turn
rack 1 time

Planning Scenario (cont.)



Material – ABC

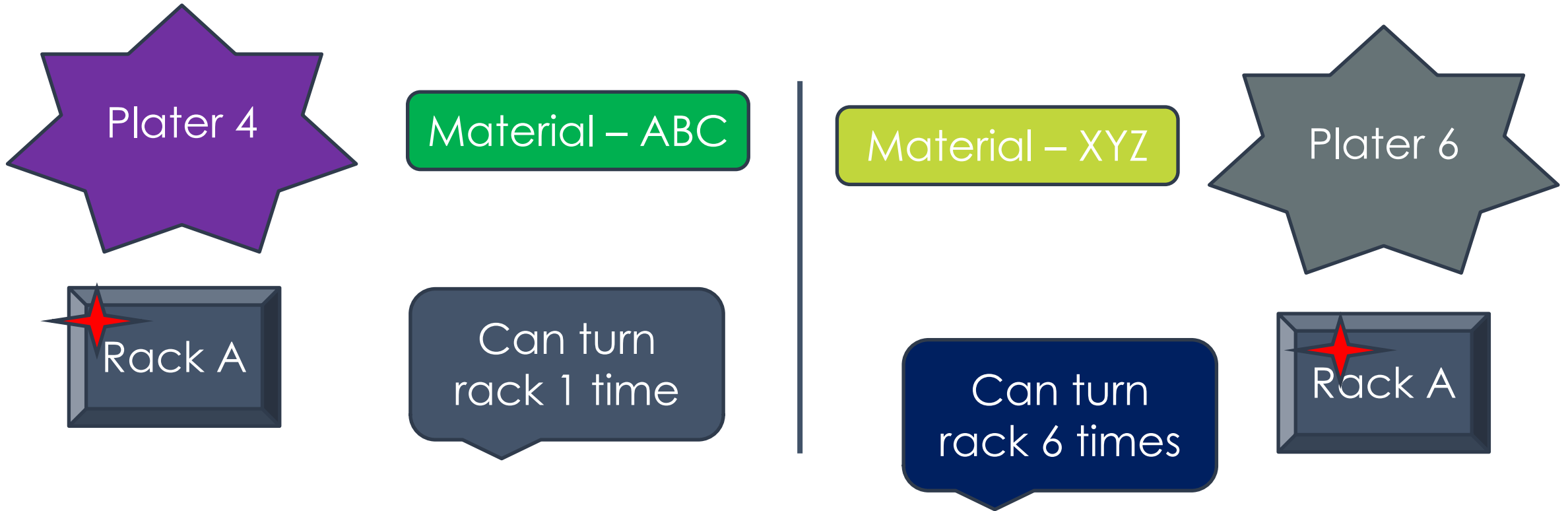


Can turn
rack 1 time

Planning Scenario (cont.)



Exercise

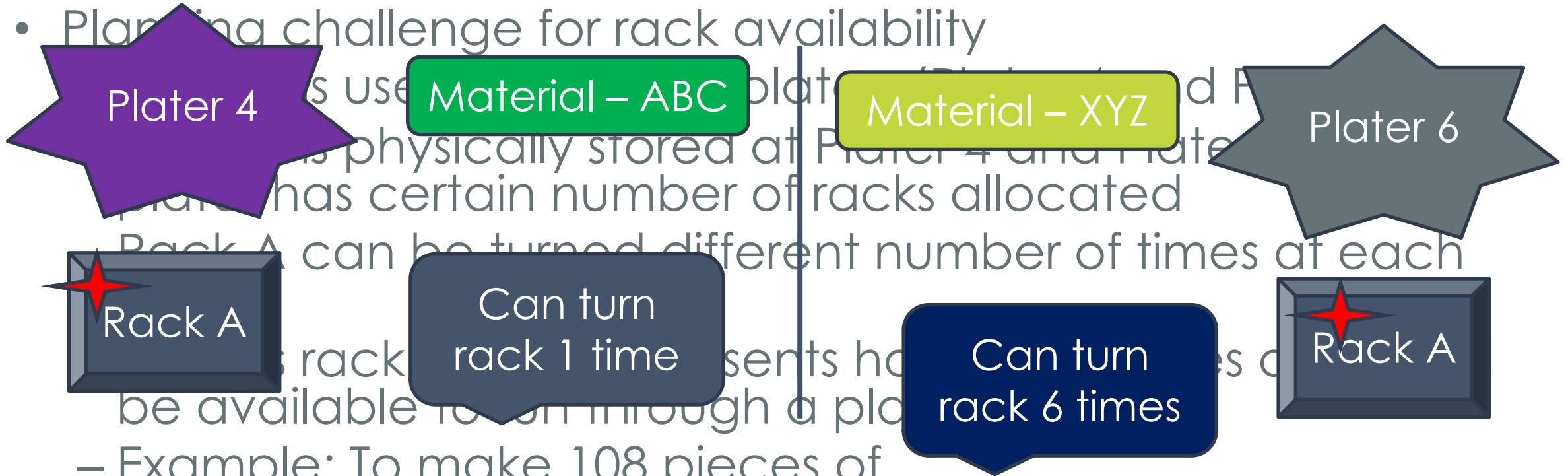


Planning Scenario (cont.)



Exercise

- Planning challenge for rack availability



– Example: To make 108 pieces of

- Material - ABC we need 6 racks at Plater 4
- Material - XYZ we need 1 rack at Plater 6

Use of Standard Capability

- Use of capacity categories to maintain rack allocation at each plater
- Use work center formula constant to maintain number of turns of a rack at each plater
- Planning data in SAP

The screenshot displays the SAP Capacity Management interface. The 'Capacities' tab is active, showing an overview of capacity categories for two platers. The 'Formula Constants' dialog is open, showing a table of parameters for rack turns.

Param.	Parameter text	Value	Un.
ZP4TUR	Plt4 # of Rack Turns	1	EA
ZP6TUR	Plt6 # of Rack Turns	6	EA

Use of Standard Capability (cont.)

Standard value key **ZMOE**

Standard Values Overview	
Key Word	Rule for Maint.
Setup	no checking
Machine	no checking
Labor	no checking
Variable Overhead	no checking
Fixed Overhead	no checking
Pieces per rack	no checking

Standard Value Maintenance

Standard value key **ZRCK**

Standard Values Overview	
Key Word	Rule for Maint.
Plater 1 Mach.Time	no checking
Plater 2 Mach.Time	no checking
Plater 3 Mach.Time	no checking
Plater 4 Mach.Time	no checking
Plater 5 Mach.Time	no checking
Plater 6 Mach.Time	no checking

	Std Value	Un	Act. Type	Efficiency
Setup	0.000	H	SETUP	<input type="text"/>
Machine	1.750	H	MACHIN	<input type="text"/>
Labor	0.330	H	LABOR	88
Variable Overhead	0.000	H	VOVRHD	<input type="text"/>
Fixed Overhead	0.000	H	FOVRHD	<input type="text"/>
Pieces per rack	8	EA		<input type="text"/>

	Std Value	Un	Act. Type	Efficiency
Plater 1 Mach.Time	0.000	H		<input type="text"/>
Plater 2 Mach.Time	0.000	H		<input type="text"/>
Plater 3 Mach.Time	0.000	H		<input type="text"/>
Plater 4 Mach.Time	0.000	H		<input type="text"/>
Plater 5 Mach.Time	0.000	H		<input type="text"/>
Plater 6 Mach.Time	24.000	H		<input type="text"/>

Display Formula

Formula Key

Formula key **ZRCAP6** Description Rack Req. Plt # 6

Formula

Formula $(\text{Plater 6 Mach.Time} / \text{Plt6 \# of Rack Turns}) * (\text{Operation quantity} / \text{Base quantity})$

Work Center Capacity

- All master data in the system
- Use standard transactions to “only” address issues (CM05 – Overload)

Work center PL43420D Plater 4 Machine P1
Capacity cat.: 001 Machine

Week	Requirements	AvailCap.	CapLoad	RemAvailCap	Unit
<input type="checkbox"/> 12/2017	0.38	0.00	999 %	0.38-	H
<input type="checkbox"/> 13/2017	36.71	55.00	67 %	18.29	H
<input type="checkbox"/> 14/2017	42.41	55.00	77 %	12.59	H
<input type="checkbox"/> 15/2017	41.39	44.00	94 %	2.61	H
<input type="checkbox"/> 16/2017	41.89	55.00	76 %	13.11	H
<input type="checkbox"/> 17/2017	49.59	55.00	90 %	5.41	H
Total >>>	212.37	264.00	80 %	51.63	H

Work center P1020 Rack Data Plating P1
Capacity cat.: ZP1 Rack

Day	Requirements	AvailCap.	CapLoad	RemAvailCap	Unit
<input type="checkbox"/> 04/05/2017	13.67	32.00	43 %	18.33	EA
<input type="checkbox"/> 04/06/2017	13.67	32.00	43 %	18.33	EA

Work center PC43310D Powder Coating MACHINE P1
Capacity cat.: 001

Week	Requirements	AvailCap.	CapLoad	RemAvailCap	Unit
<input type="checkbox"/> 12/2017	0.00	0.00	0 %	0.00	H
<input type="checkbox"/> 13/2017	82.45	90.00	92 %	7.55	H
<input type="checkbox"/> 14/2017	100.76	90.00	112 %	10.76-	H
<input type="checkbox"/> 15/2017	70.84	72.00	98 %	1.16	H
Total >>>	254.05	252.00	101 %	2.05-	H

Work center P1020 Rack Data Plating P1
Capacity cat.: ZP4 Rack

Day	Requirements	AvailCap.	CapLoad	RemAvailCap	Unit
<input type="checkbox"/> 04/05/2017	21.00	36.00	58 %	15.00	EA
<input type="checkbox"/> 04/06/2017	18.00	36.00	50 %	18.00	EA

Component Constraint

- Configure standard material checking based on business requirements
- Transaction MDVP – Planned order and production order component check
- Automatic material check during production order creation and release
- System configured to not allow release when shortages exist
- System provides information needed when there is a shortage
- Result: Constraint free production schedule. Let SAP do the work for you.

The screenshot displays the SAP MDVP transaction interface with the following data:

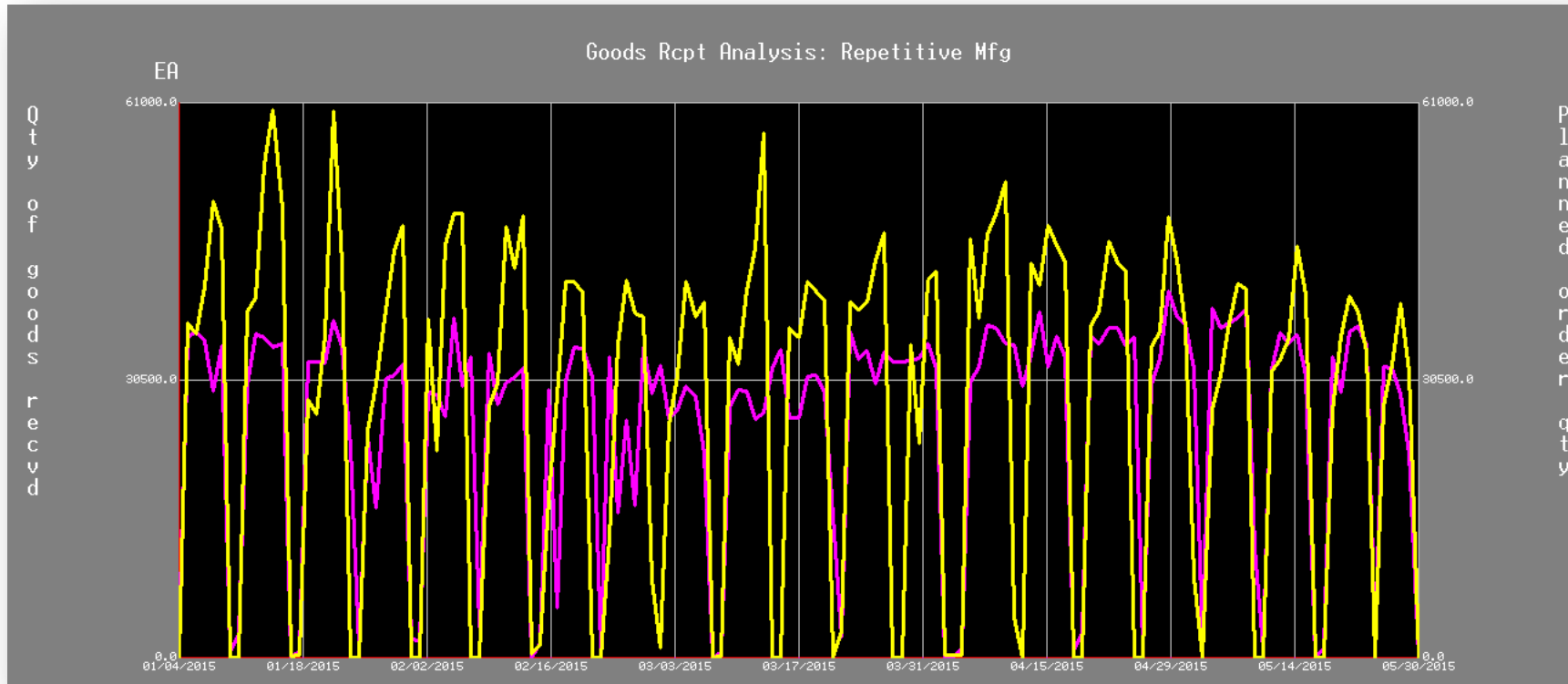
Quantities	
Order quantity	1,000 EA
Committed qty	35
Scrap quantity	
Type avail.chck	ATP check

Dates/Times			
	Basic Dates	Production Dates	Other Dates
End	03/23/2017	03/23/2017 23:59:59	Available for MRP 03/24/2017
Start	03/22/2017	03/22/2017 19:25:41	GR processing time 1
Opening	03/21/2017		Total commitment 03/28/2017

Project Goals and Results

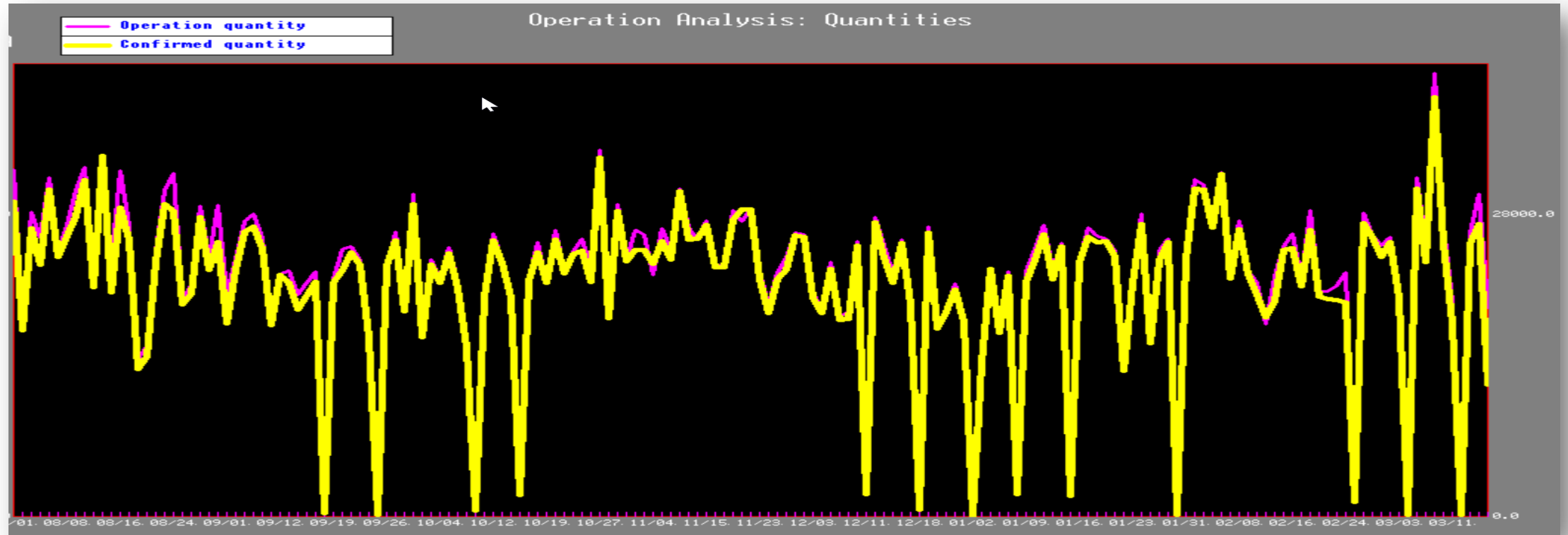
- Make SAP one system of record
- All planning-related data in SAP
- Use solutions we already own
- Let the system do the work for you
- Common transactions to plan/schedule
 - Exception monitoring (MD06)
 - Long-term component availability check (MDVP results)
 - CM01 and CM05 to evaluate capacity
 - CO41 to convert planned orders to production orders
 - COOIS to review shortages, how much we can build, what date to move to
 - CM25 to sequence orders with in a day/week
 - CO05N to release orders
- Master data in SAP provides system supported data to make long-term decisions
 - Example – buy more racks, add another operation shift, add labor, etc.

Results



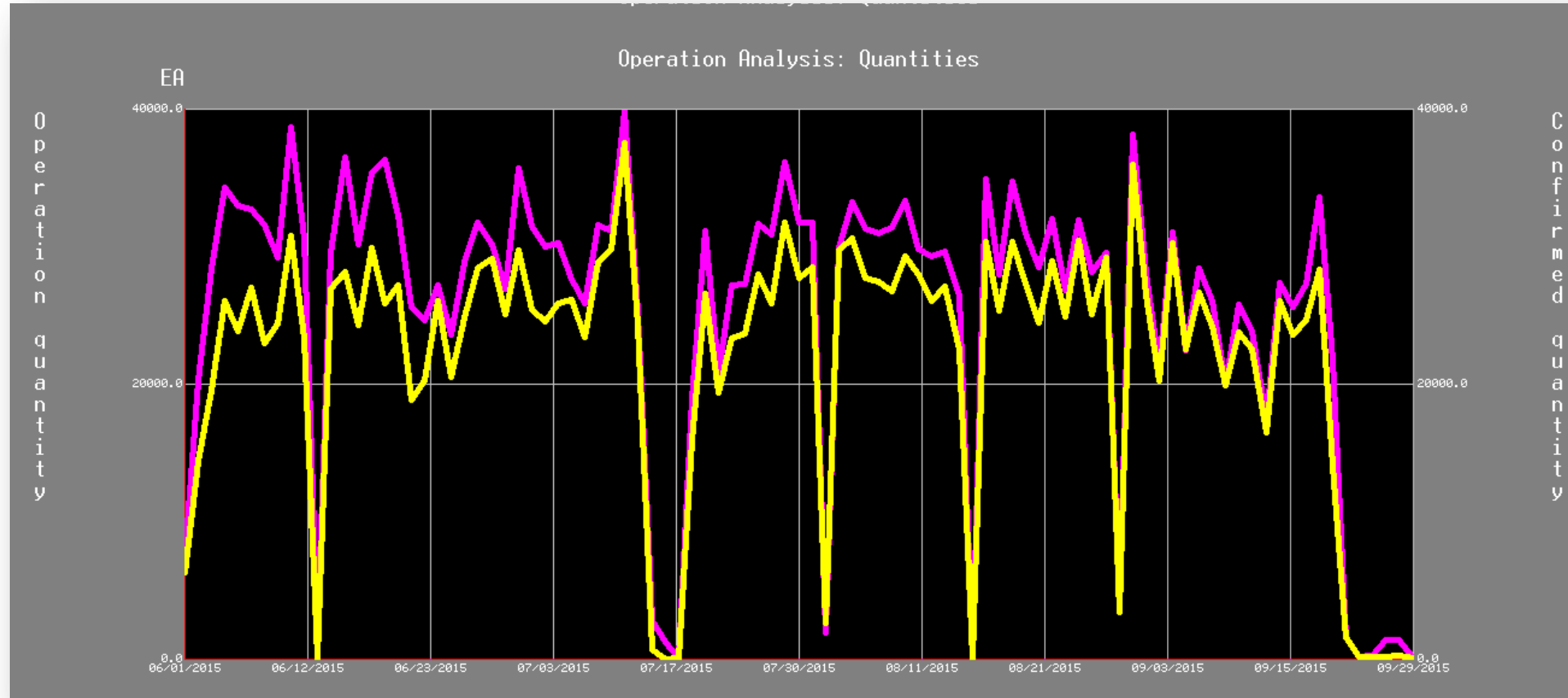
- Capacity Constraints – Machine, Labor & Rack
- Poor Schedule Attainment
- Low predictability leading to poor service

Results (cont.)

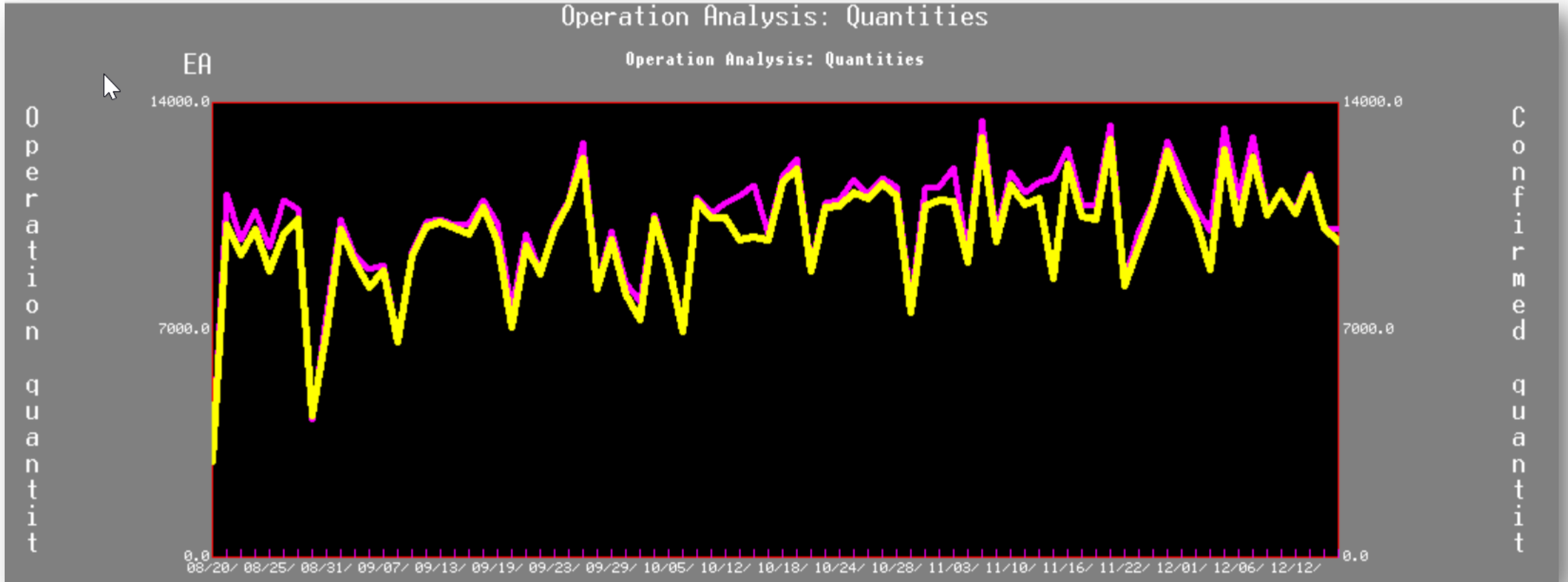


- Scheduling within capacity
- Driving control and stability on the floor
- Increased productivity and predictability

Results (cont.)



Results (cont.)



Results (cont.)



Results (cont.)

Overall Schedule Attainment Summary

Schedule Attainment 29.32 ←
Fill Rate 35.91
of Orders scheduled 410



Sched.Finish	Location	Work center	Description	Sched Orders	Orders Executed	Orders missed	Overall sched attainment%	Sche Quant	Confirmed qty	Missed qty
02/15/2016	SLVS	IN40510D	Insp/Packout (PVD)	49	13	36	19.90	11,263.000	3,395.000	7,868.000
02/16/2016	SLVS	IN40510D	Insp/Packout (PVD)	37	11	26	20.75	8,050.000	3,061.000	4,989.000
02/17/2016	SLVS	IN40510D	Insp/Packout (PVD)	35	9	26	21.97	5,495.000	2,002.000	3,493.000
02/18/2016	SLVS	IN40510D	Insp/Packout (PVD)	46	15	31	24.89	9,305.000	2,717.000	6,588.000
02/19/2016	SLVS	IN40510D	Insp/Packout (PVD)	45	15	30	23.55	8,957.000	3,015.000	5,942.000
02/20/2016	SLVS	IN40510D	Insp/Packout (PVD)	2	2	0	98.56	513.000	510.000	3.000
02/22/2016	SLVS	IN40510D	Insp/Packout (PVD)	73	34	39	39.38	17,992.000	8,453.000	9,539.000
02/23/2016	SLVS	IN40510D	Insp/Packout (PVD)	27	12	15	36.11	10,033.000	3,009.000	7,024.000
02/24/2016	SLVS	IN40510D	Insp/Packout (PVD)	33	16	17	38.55	6,772.000	2,820.000	3,952.000
02/25/2016	SLVS	IN40510D	Insp/Packout (PVD)	38	17	21	37.49	8,508.000	2,720.000	5,788.000
02/26/2016	SLVS	IN40510D	Insp/Packout (PVD)	25	9	16	22.45	9,274.000	2,834.000	6,440.000

Results (cont.)

Overall Schedule Attainment Summary

Schedule Attainment
Fill Rate
of Orders scheduled

96.53
 96.72
 321



Sched.Finish	Location	Work center	Description	Sched Orders	Orders Executed	Orders missed	Overall sched attainment%	Sche Quant	Confirmed qty	Missed qty
02/15/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	30	30	0	99.30	7,261.000	7,191.000	70.000
02/16/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	38	38	0	98.18	9,817.000	9,707.000	110.000
02/17/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	36	34	2	91.38	8,807.000	8,315.000	492.000
02/20/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	53	53	0	97.31	7,928.000	7,813.000	115.000
02/21/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	35	34	1	92.91	9,274.000	8,523.000	751.000
02/22/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	39	39	0	96.84	7,709.000	7,370.000	339.000
02/23/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	59	59	0	97.22	9,936.000	9,685.000	251.000
02/24/2017	SLVS	<u>IN40510D</u>	Insp/Packout (PVD)	31	31	0	98.87	6,098.000	6,031.000	67.000

Results (cont.)

Overall Schedule Attainment Summary

Schedule Attainment 57.68
Fill Rate 61.92
of Orders scheduled 993



Sched.Finish	Location	Work center	Description	Sched Orders	Orders Executed	Orders missed	Overall sched attainment%	Sche Quant	Confirmed qty	Missed qty
05/16/2016	POWDERCOAT	PC43310D	Powder Coating	79	41	38	41.99	30,718.000	15,285.000	15,433.000
05/17/2016	POWDERCOAT	PC43310D	Powder Coating	84	65	19	65.02	25,738.000	17,260.000	8,478.000
05/18/2016	POWDERCOAT	PC43310D	Powder Coating	152	111	41	53.97	48,083.000	27,769.000	20,314.000
05/19/2016	POWDERCOAT	PC43310D	Powder Coating	138	85	53	44.06	32,669.000	13,487.000	19,182.000
05/20/2016	POWDERCOAT	PC43310D	Powder Coating	64	58	6	75.99	18,616.000	15,610.000	3,006.000
05/23/2016	POWDERCOAT	PC43310D	Powder Coating	121	94	27	64.48	36,969.000	26,425.000	10,544.000
05/24/2016	POWDERCOAT	PC43310D	Powder Coating	124	97	27	62.33	34,179.000	23,017.000	11,162.000
05/25/2016	POWDERCOAT	PC43310D	Powder Coating	110	86	24	56.47	32,316.000	20,696.000	11,620.000
05/26/2016	POWDERCOAT	PC43310D	Powder Coating	121	94	27	62.90	32,783.000	21,287.000	11,496.000

Results (cont.)

Overall Schedule Attainment Summary

Schedule Attainment
Fill Rate
of Orders scheduled

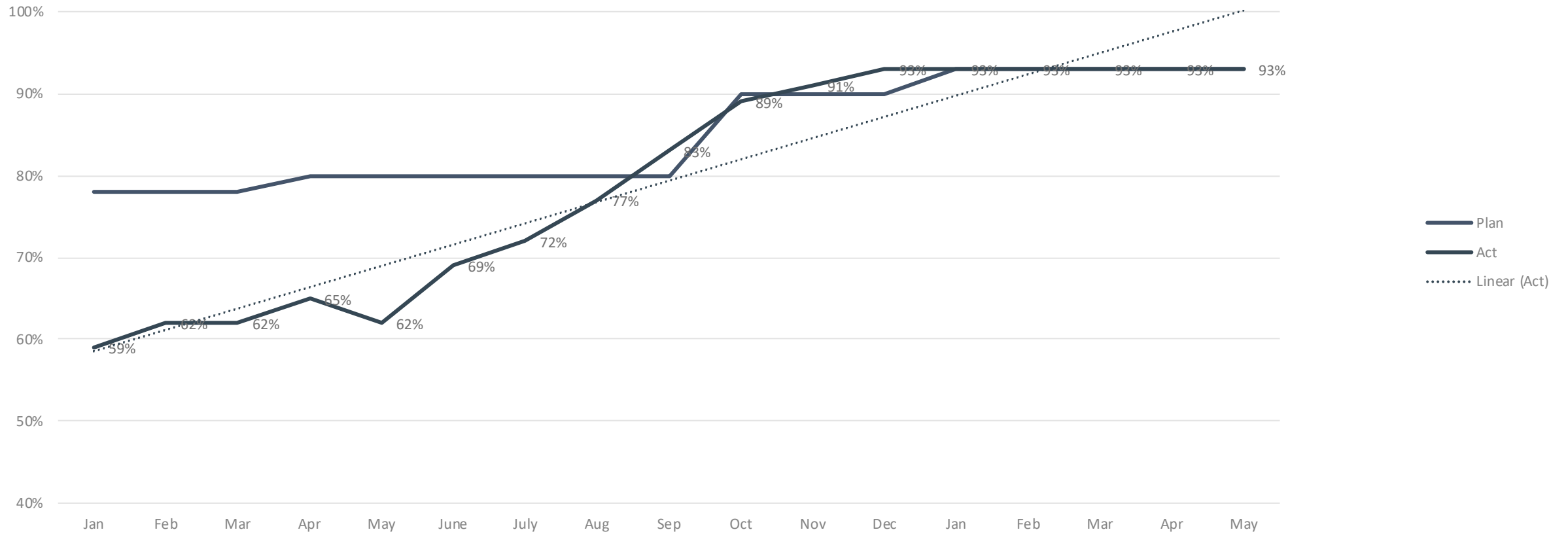
95.01
 97.33
 729



Sched.Finish	Location	Work center	Description ↓	Sched Orders	Orders Executed	Orders missed	Overall sched attainment%	Sche Quant	Confirmed qty	Missed qty
01/16/2017	POWDERCOAT	PC43310D	Powder Coating	66	66	0	94.86	23,313.000	22,712.000	601.000
01/17/2017	POWDERCOAT	PC43310D	Powder Coating	78	78	0	93.25	25,591.000	23,730.000	1,861.000
01/18/2017	POWDERCOAT	PC43310D	Powder Coating	67	67	0	94.36	24,303.000	23,387.000	916.000
01/19/2017	POWDERCOAT	PC43310D	Powder Coating	77	76	1	94.68	27,093.000	26,461.000	632.000
01/20/2017	POWDERCOAT	PC43310D	Powder Coating	51	51	0	97.45	21,149.000	20,746.000	403.000
01/21/2017	POWDERCOAT	PC43310D	Powder Coating	57	57	0	97.71	19,497.000	19,099.000	398.000
01/23/2017	POWDERCOAT	PC43310D	Powder Coating	65	65	0	95.36	20,131.000	19,766.000	365.000
01/24/2017	POWDERCOAT	PC43310D	Powder Coating	72	70	2	93.82	24,062.000	23,722.000	340.000
01/25/2017	POWDERCOAT	PC43310D	Powder Coating	58	56	2	95.07	20,575.000	20,365.000	210.000
01/26/2017	POWDERCOAT	PC43310D	Powder Coating	73	72	1	96.29	24,280.000	23,584.000	696.000
01/27/2017	POWDERCOAT	PC43310D	Powder Coating	65	63	2	93.52	24,911.000	24,524.000	387.000

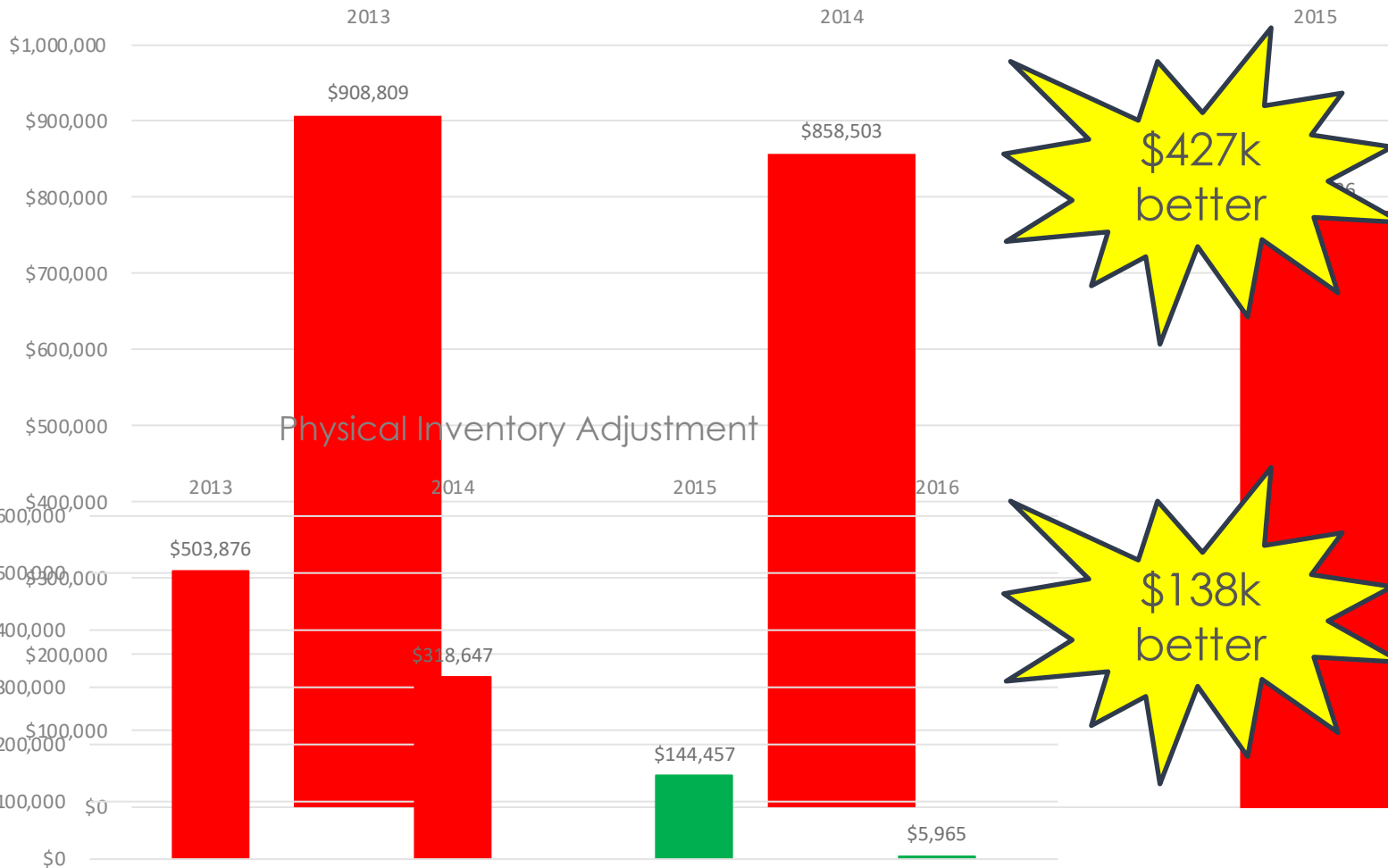
Results (cont.)

Plant Schedule Attainment



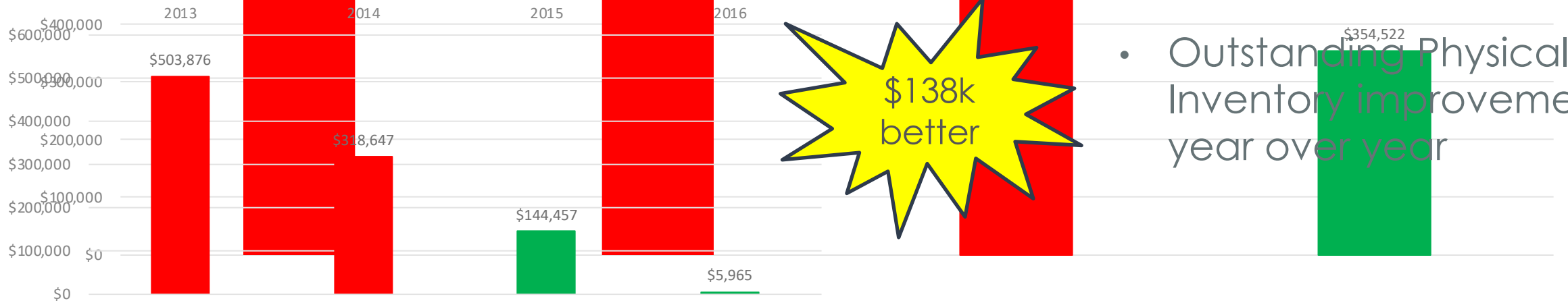
Results — Inventory Accuracy

Total Plant Inventory Adjustment



- Significant improvement in transactions
- Inventory reduction leading to better control of cycle counting processes

Physical Inventory Adjustment



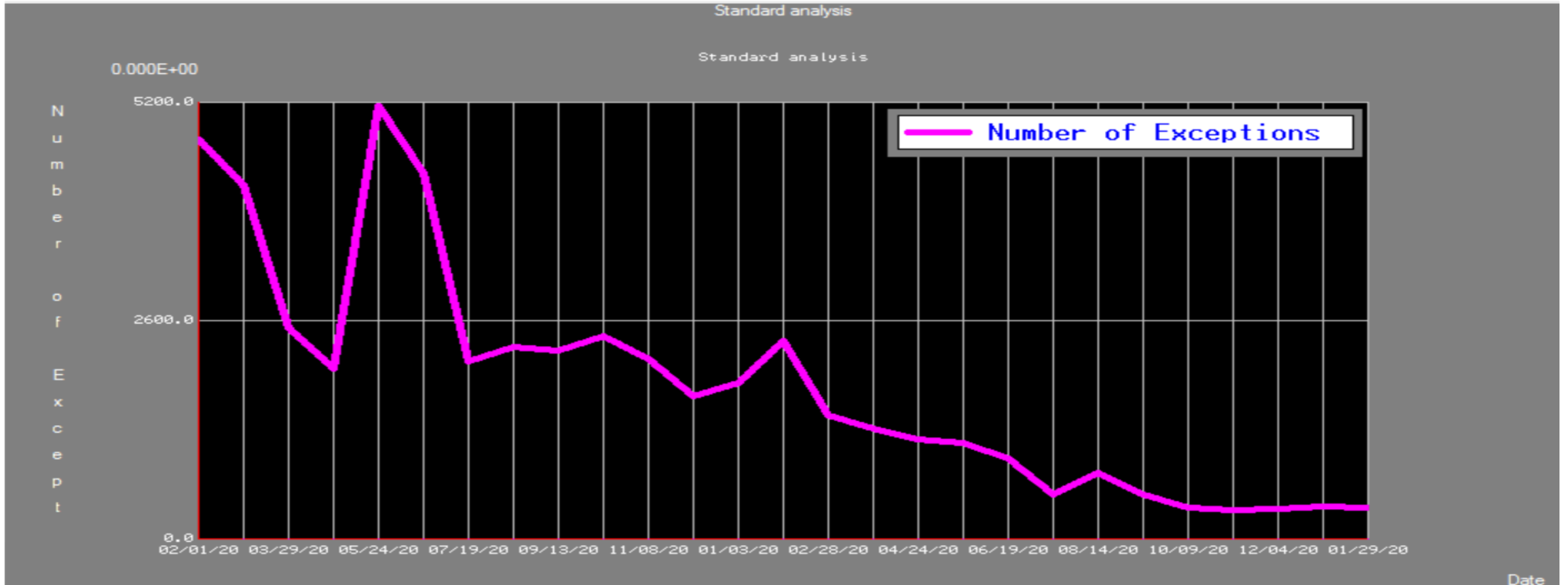
- Outstanding Physical Inventory improvements year over year

Results — Inventory Accuracy (cont.)

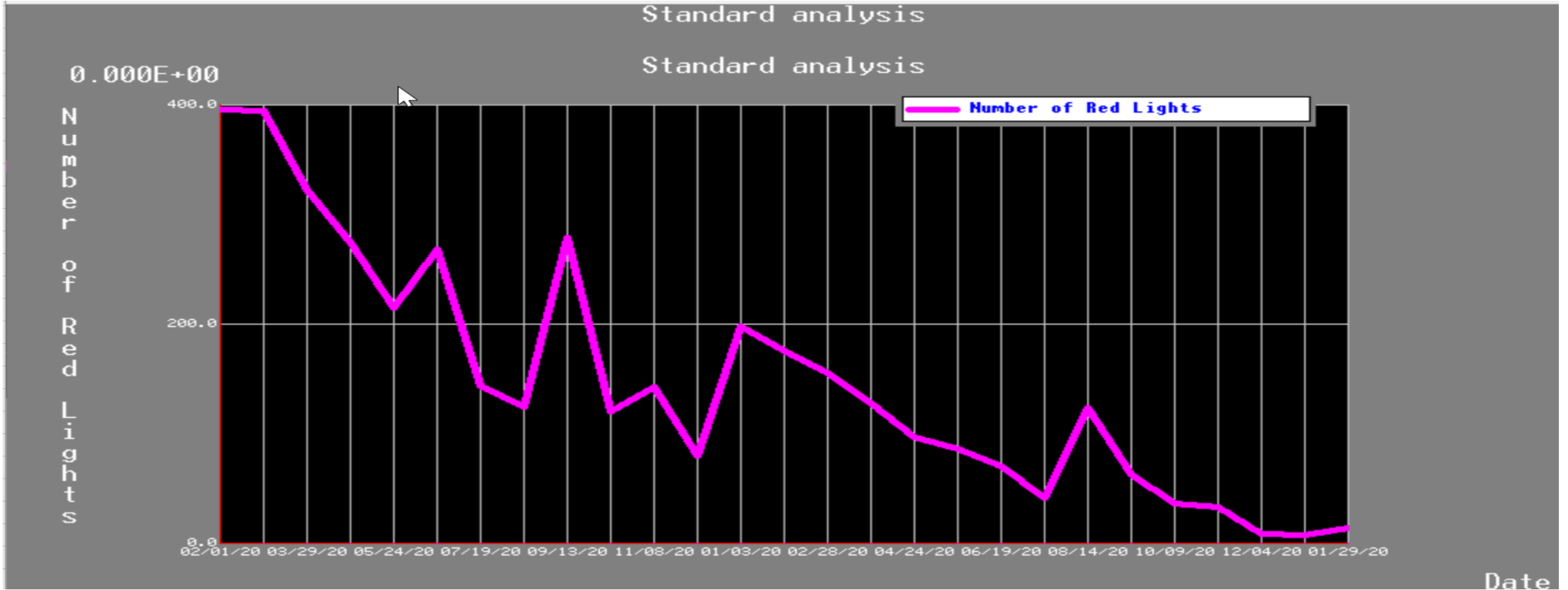


- 38% WIP reduction (\$275K)
- 20% Total Plant reduction (~\$1.5M)

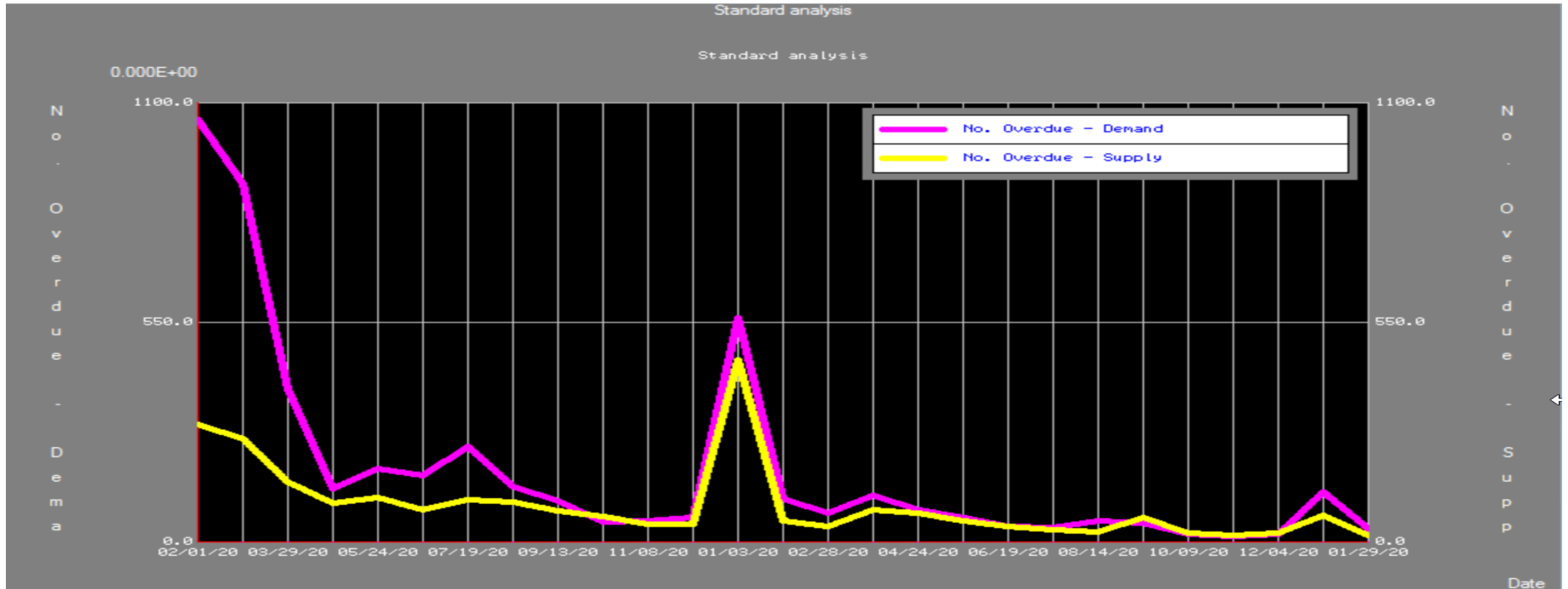
Results — Supply Chain Health



Results — Supply Chain Health (cont.)



Results — Supply Chain Health (cont.)



Key Points to Take Home

- Make SAP the one true system of record
- Align business rules and planning processes to shop-floor processes
 - People, process, and technology
- Leverage standard SAP transactions and tools – let it do the work
- Use optimization of master data to reduce misalignment of supply/demand signals
- Break down silos to transform your business

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