



Expanding Planning and Scheduling Processes in SAP

April 24, 2024

Agenda



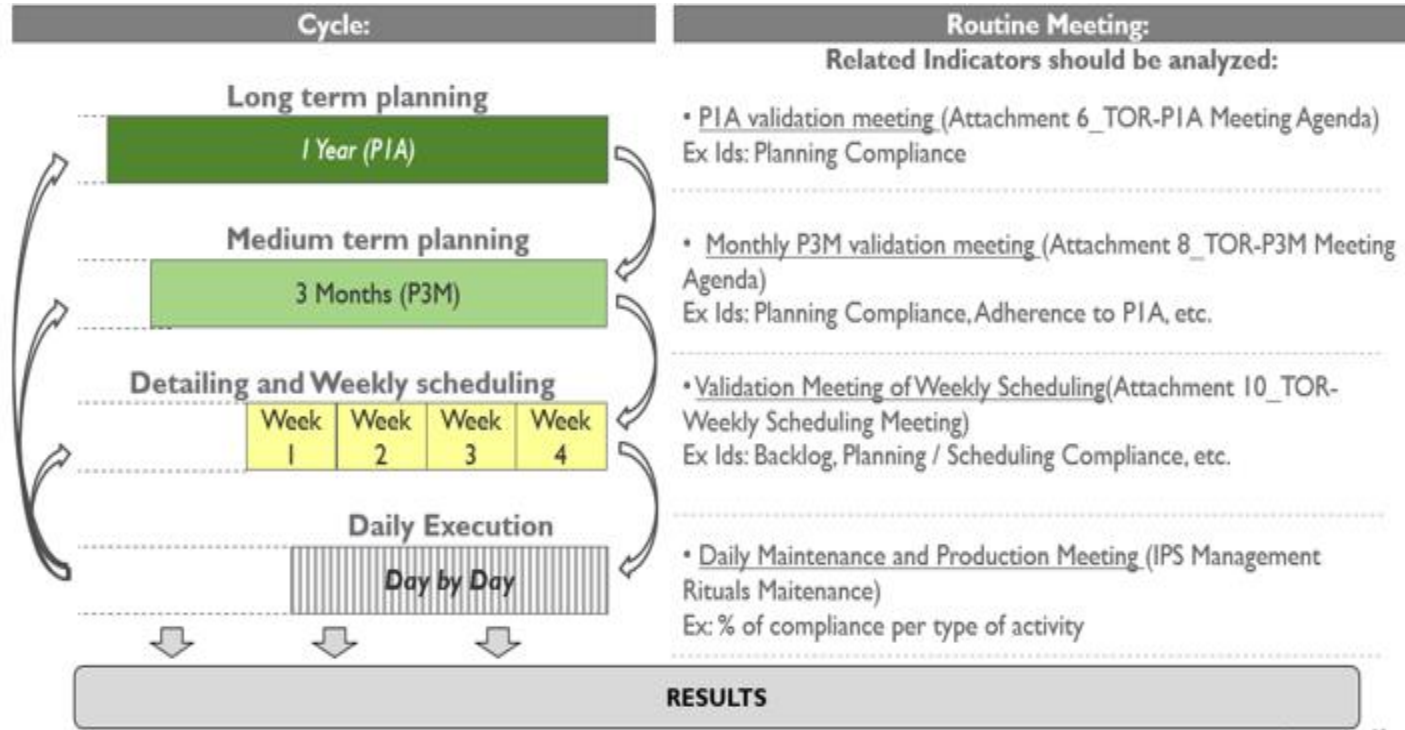
- Where We Started
- Target Planning and Scheduling Cycle
- Aligning Maintenance and Operations
- Aligning Tools and Expectations
- New Metrics
- Material Movement and Requisition Control
- Navigator for Meeting Facilitation
- Major Outage Planning and Scheduling
- Growth and Organizational Changes

Where We Started



- Operation outage expectations not in alignment with internal SAP Data
 - Multiple sources of the truth
 - Need for tools outside of SAP to manage outages
 - Outage scope not clear within SAP
 - Poor linkages between maintenance needs and production impacts
- Unclear timelines for backlog work
 - Default order for earliest execution
 - Increased on hand inventory
- One weekly Planning and Scheduling meeting
 - Too many attendees with no input
 - Requests not present in the system
 - Planning inputs came Wednesday or Thursday for next week
- Major outages governed outside of SAP
 - Microsoft project
 - Some users made SAP updates and others Project Updates
 - Not a good meeting or update structure
- Highly inaccurate planning accuracy

Planning and Scheduling Cycle



Target

- PIA - Define the PM Shut Down calendar
- P3M - Align downtime work orders with the maintenance plan projections
- Weekly – Maximize utilization with high risk and noninvasive work
- Daily – Risk based decision making to coordinate planned schedule with high priority failures

Source: IPS Reliability – Planning and Scheduling, book 7

Align SAP and PIA PM Calendars



Maintenance Plan	MaintPlan descrptn	MaintItem	Maintenance item description	Equipment
A-BAG-223A	BULK SILO #1 ANNUAL PM	8000030718	52 WK FAN AND HOUSING INSPECTION	A48A32C
A-BAG-223A		8000030721	52 WK CHAIN/BELT INSPECTION	A48G408
A-BAG-223A		8000030722	52 WK CHAIN/BELT INSPECTION	A48G409A
A-BAG-223A		8000030725	52 WK BUCKET INSPECTION	A48A32C
A-BAG-223A		8000030728	52 WK BUCKET INSPECTION	A48G408
A-BAG-223A		8000030729	52 WK BUCKET INSPECTION	A48G409A
A-BAG-223A		8000030732	52 WK OFFLINE MOTOR CIRCUIT ANALYSIS	A48A32C
A-BAG-223A		8000030735	52 WK OFFLINE MOTOR CIRCUIT ANALYSIS	A48G408
A-BAG-223A		8000030736	52 WK OFFLINE MOTOR CIRCUIT ANALYSIS	A48G409A
A-BAG-223A		8000037929	2001 BULK SILO BAG CHANGE	A48A32
A-BAG-223A		8000041929	52 WK VFD INSPECTION	A48G409A

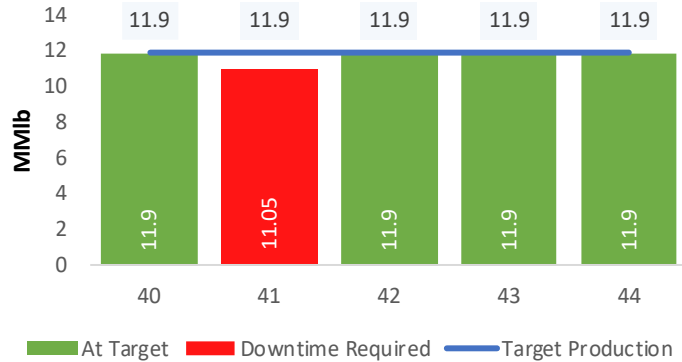
- Initial setup was for a 1:1 match between maintenance plans and maintenance items.
 - Many compatible items were not in alignment, update required multiple moves and checks.
- New setup combined multiple maintenance items and equipment within each maintenance plan.
 - Maintenance plans became our outage master plans.
 - Better visibility and balancing of outage work.

Monthly Projection & Downtime



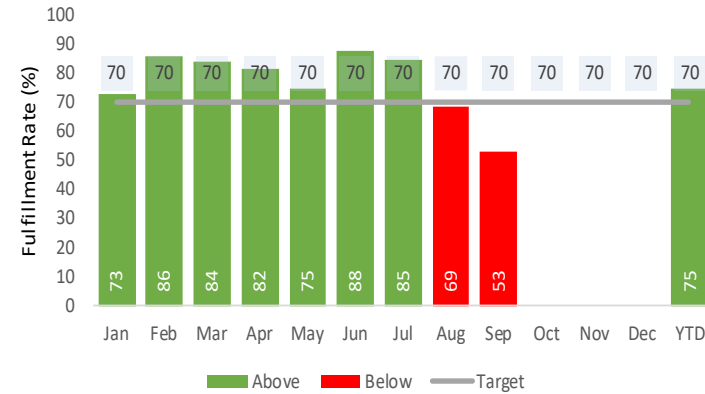
55 | Projection

MMlb/wk



REFINERY | P3M FULFILLMENT RATE

Fulfillment Rate (%)



Monthly Production & Maintenance Meeting

From Last Month:
Fulfillment Rate

- Items completed in expected month

Deviations

- SAP deviation codes in conjunction with notes

For Next Month:

Production Projection

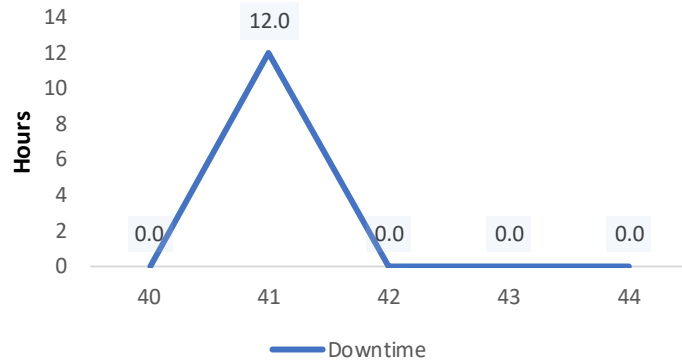
- Based on nominal rates @ expected uptime

Equivalent Downtime

- 4 hours @ 25% reduction = 1-hour equivalent DT

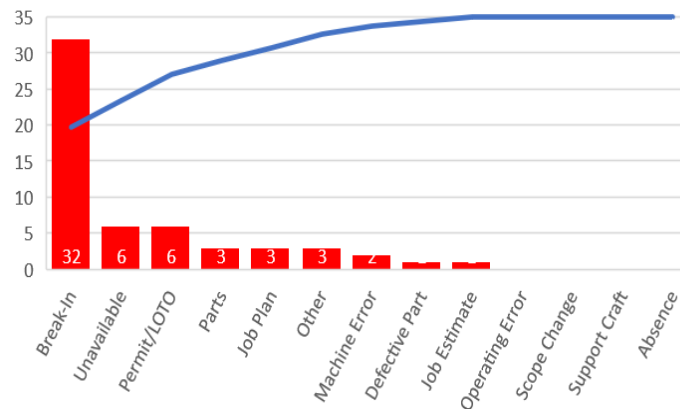
55 | Downtime

Hrs/wk



REFINERY | P3M DEVIATIONS

Count



Material Movements and Requisition Control



General	Internal	External	Dates	Act. Data	Enhancement
Operation qty	1.0	H	Sort Term		
Price		USD	per	1	
Material Group			Cost Element		
Purch. group		/ 0450	Vendor		
Agreement		/	Info Record		
Recipient			Unloading Point		
Requisitioner			Tracking Number		
Pl. Deliv. Time	25				

Components		Relationships										
Itm	Component	Del time (days)	Sub String	G/L Account	Vendor	Info Record	Tracking Number	Vendor Mat. No.	GR Proc. Time	Reqmt Date	Delivery D...	
0010	257245	25		782400	405917	5300109016			10	09/22/2023	09/12/2023	
0020	457246	25		782400	405917	5300109018			10	09/22/2023	09/12/2023	
0030	505032	5		782400	405917	5300020806			10	09/22/2023	09/12/2023	

0101	A23WEK44	Maintenance Week 44 2023
0101	A23WEK45	Maintenance Week 45 2023
0101	A23WEK46	Maintenance Week 46 2023
0101	A23WEK47	Maintenance Week 47 2023

Revision	Pl. Deliv. Time	Delivery Date
A23WEK46	5	11/03/2023
A23WEK45	25	10/27/2023
A23WEK45	7	10/27/2023
A23WEK46	7	11/03/2023
A23WEK47	56	12/01/2023
A23WEK46	56	11/03/2023
A23WEK47	3	07/22/2023

- Coordinated usage of Revision codes, Goods Receipt Processing Time, and Planned Delivery Time
- Intended to facilitate movement closer to just in time material receipt

Revision through OIOB

Meeting Facilitation Through Navigator



Weekly Planning Meetings

- P&S TOR
- Safety Notifications
- Environmental
- Reliability
- ME SharePoint
- Schedule Confirmation

Visible

Skip First

Default Variants

New Session

Text

Icon Name

Quick Info

T-Code URL

URL

Variant

Visible

Skip First

Default Variants

New Session

Text

Icon Name

Quick Info

T-Code URL

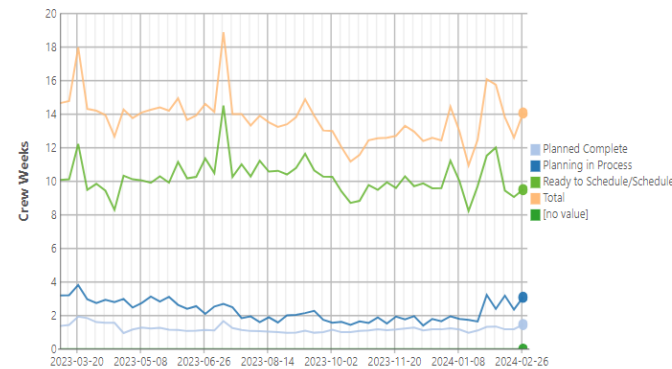
URL

Variant

WEEKLY MEETING - SCHEDULING		
1 MEETING		
Weekly Maintenance Scheduling Meeting		
2 PURPOSE		
<ul style="list-style-type: none"> . Analyze the fulfillment of the orders scheduled in the previous week . Validate next week's schedule . Analyze maintenance planning and scheduling indicators . Propose actions for delays in executions and discuss emergency orders for the week . Review the Preventive Maintenance calendar for the next 3 months (M+3), taking into account the scheduled production. 		
3 OWNER	4 PARTICIPANTS	5 PLACE
Area Scheduler	<ul style="list-style-type: none"> . Maintenance managers . Department manager/Ops Leads . Foremen . Optional . Reliability Engineer . Plant Maintenance Manager 	Meeting room Maintenance adm.
6 TIME	7 FREQUENCY	
60 min	Weekly - Thursday (10:00 AM)	
9 INPUT	10 OUTPUT	11 INDICATORS
<ul style="list-style-type: none"> . Pending orders scheduled for previous week . Open orders released per area . Initial scheduling . MH available for next week (maintenance supervisor) . MH confirmed in the week (time sheet recording notes rate) . Current P3M 	<ul style="list-style-type: none"> . Next week's schedule (prioritized by severity) . Actions for unfulfilled orders . MH scheduled for next week . P3M orders, last week of the month, presented. 	<ul style="list-style-type: none"> . Schedule fulfillment rate . Labor scheduling rate . P3M fulfillment rate
12 SCHEDULE		WHO TIME
1	Review Safety, Environmental, GMP, FOC Backlog	Area Scheduler 10 min
2	Schedule attainment, utilization	Area Scheduler 10 min
3	Present the schedule preview for next week	Area Scheduler 10 min
4	<ul style="list-style-type: none"> Validate the weekly schedule of orders: . Add/change services according to severity and observations of the production coordinator. . Check Labor scheduling rate. Remove/add services according to the needs 	Area Scheduler 30 min
5	Report P3M scheduling, in the last week of the month.	Area Scheduler 15 min

Earl.start date	Work center	Order	Maih/ActvType	Equipment	Equipment Desc.	Oper./Acd.	Opr. short text	No Remain. Work
	Work center: *REF-INS							
02/27/2023	REF-INS	300001583398	INS	A61996	CONDENSATE COMPOSITE TOC	0010	MON DAILY UTL TOC INSPECTION	
02/27/2023	REF-INS	300001583399	INS	A61998	WEST REFINERY TOC	0010	MON DAILY UTL TOC INSPECTION	
02/27/2023	REF-INS	300001583400	INS	A61999	EAST REFINERY TOC	0010	MON DAILY UTL TOC INSPECTION	
02/27/2023	REF-INS	300001583401	INS	A61750	FEEDWATER PH TRANSMITTER	0010	MON DAILY UTL TOC INSPECTION	
02/27/2023	REF-INS	300001583402	INS	A41760	REFINERY WASTE TOC ANALYZER	0010	MON DAILY REF TOC INSPECTION	
02/27/2023	REF-INS	300001583404	INS	A49132A	CORN SYRUP SODA ASH ADDITION FC #1 & #2	0010	WEEKLY PH PROBE CLEANING	
02/27/2023	REF-INS	300001583405	INS	A49132B	CORN SYRUP SODA ASH ADDITION FC #1 & #2	0010	WEEKLY PH PROBE CLEANING	
02/27/2023	REF-INS	300001583504	INS	A43082	SPENT WELL WATER TOC	0010	MON DAILY REF TOC INSPECTION	
02/27/2023	REF-INS	300001584547	MNT	A56126	NORTH RAIL CAR WASH DISCHARGE TEMP	0020	Hard wire CW temp probe	
	Work center: *REF-MELE							
02/27/2023	REF-MELE	300001584547	MNT	A56126	NORTH RAIL CAR WASH DISCHARGE TEMP	0010	Run conduit for temp probe at CW	
	Work center: *REF-SMEC							

Open Work Backlog (crew weeks) [trend]



Major Outage Planning and Scheduling



Lock box number	Locked out	Work in progress	Work complete	LOTO cleared	Order	Equipment	Equipment Desc.	Object Description	Work center	2021																		
										April 20																		
										6a	7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	7p	8p	9p	10p		
Work center: *MEC-OTHR																												
					00001172790	A42J55	FRUCTOSE THERMOCOMPRESSOR	15lb steam line to 42 evap leaking	MEC-OTHR	[Gantt bar from 6a to 6p]																		
					0001274788	A49E27	VACUUM PUMP HEAT EXCHANGER APV-SR9 FRAM	Replace bad section of inlet pipe. 49E27	MEC-OTHR	[Gantt bar from 6a to 7a]																		
					001254594	A49J20	CLARIFICATION VACUUM PUMP #5 E-RM 1	Nash to Scope Vac pump internal	MEC-OTHR	[Gantt bar from 6a to 4p]																		
					30001273692	A45J01	ROYAL EVAPORATOR VACUUM EJECTOR	LDex Vacuum jet condenser head replacmnt	MEC-OTHR	[Gantt bar from 6a to 6p]																		
					30001273694	A43J60	55% HFCS FINISHER VACUUM SYSTEM	Fruc Vacuum jet condenser head replacmnt	MEC-OTHR	[Gantt bar from 6a to 6p]																		
					30001273695	A49J05	VACUUM EJECTOR CORN SYRUP EVAPORATOR 'A'	CS Vacuum jet condenser head replacement	MEC-OTHR	[Gantt bar from 6a to 6p]																		
					3000176588	A41T03	HYDROLYZATE STRACH PREP TANK	Starch prep TK work for outage	MEC-OTHR	[Gantt bar from 6a to 6p]																		
					3000174789	A49P20	VAC.PUMP SEAL WATER PUMP #1N E-RM 11,180	Replace discharge piping. 49P20	MEC-OTHR	[Gantt bar from 6a to 6p]																		

Edit Display Settings

Name: U_JKIRK Protected

Description: [Empty field]

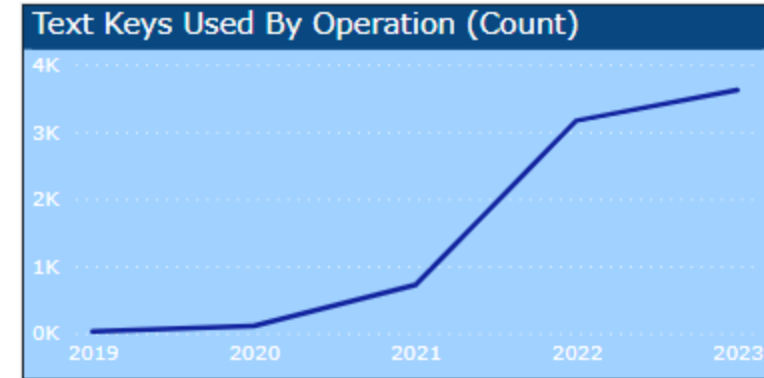
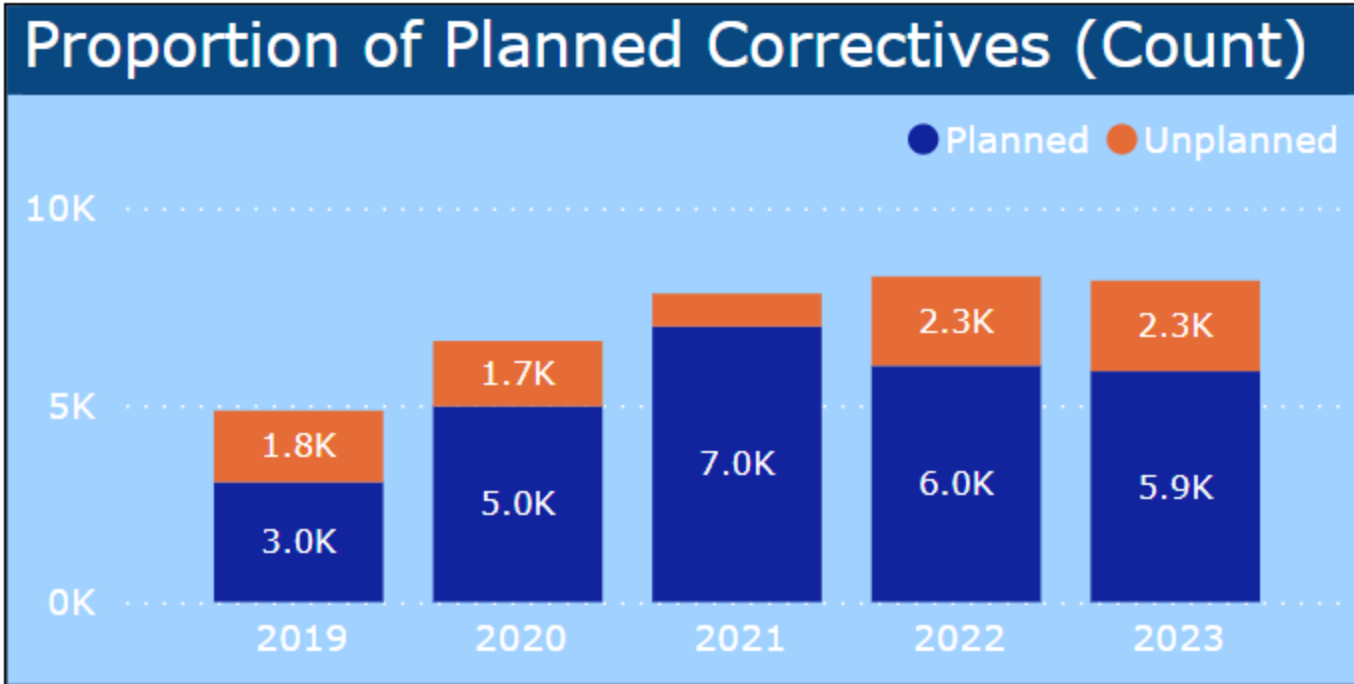
Chart Capacity Orders Operations Subsort Fields Other

Active	Fieldname	Offset	Length	Description
<input checked="" type="checkbox"/>	[Dropdown]	<input type="text"/>	<input type="text"/>	Lock box number
<input checked="" type="checkbox"/>	[Dropdown]	<input type="text"/>	<input type="text"/>	Locked out
<input checked="" type="checkbox"/>	[Dropdown]	<input type="text"/>	<input type="text"/>	Work in progress
<input checked="" type="checkbox"/>	[Dropdown]	<input type="text"/>	<input type="text"/>	Work complete
<input checked="" type="checkbox"/>	[Dropdown]	<input type="text"/>	<input type="text"/>	LOTO cleared

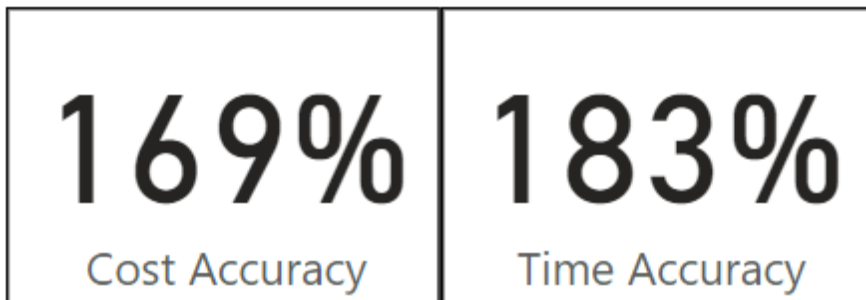
[Save] [Print] [Close]

- Utilization of Planning Board as Gantt Chart
- Eliminated external tools – one source of truth
- Use of custom tracking fields
 - Lock box number
 - Locked out
 - Work in progress
 - Work complete
 - LOTO cleared
- Printed as a physical product in the workspace

Growth and Key Changes

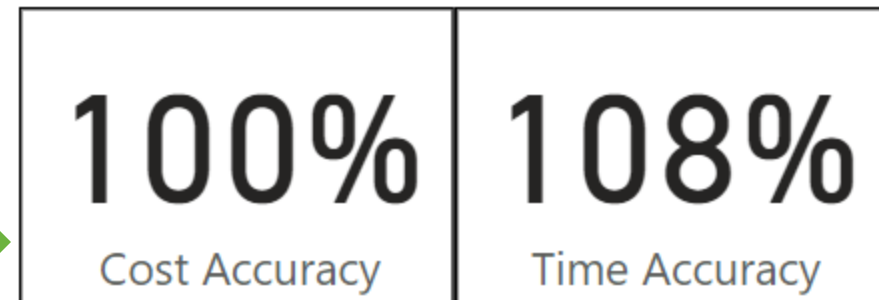


- 2019 – 5 Planner/Schedulers
- 2020 – Centralization/Standardization
- 2021 – Focus on SJPs through standard text keys
- 2022 – 6 dedicated planners w/ ELE & INS
- 2023 – Turned over 4 of 6 positions



← **Start**

Today →



Questions?

