BIOMANUFACTURING CUSTOMER STORY

End-to-End Planning System Incorporates Strategic Considerations

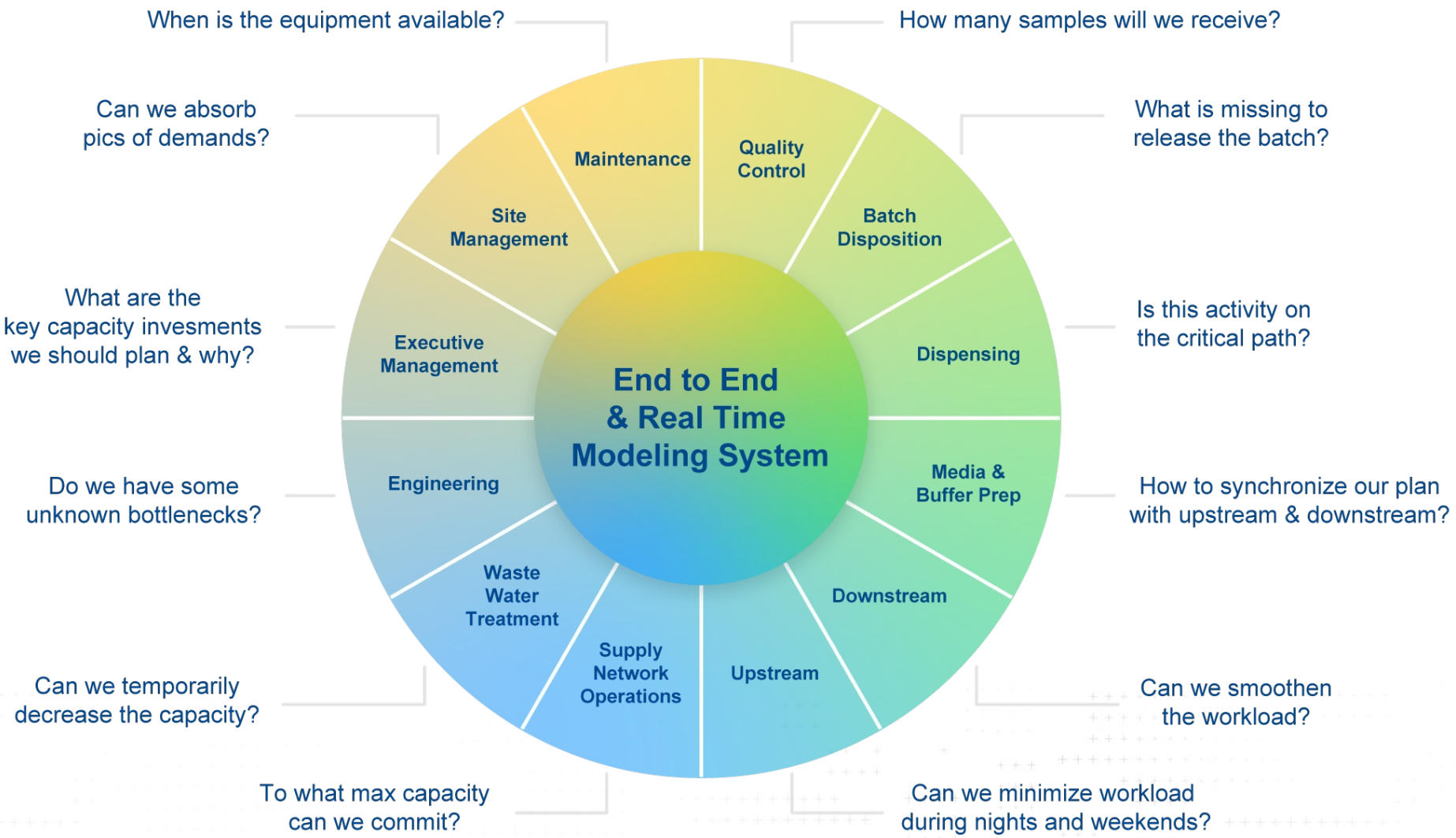
CONTINUA PROCESS SYSTEMS

End-to-End Planning System Incorporates Strategic Considerations

Customer Situation

As this customer’s facility continued to ramp up production, each minute and every resource became increasingly valuable to optimize in a methodical manner. See how they improved manually-based schedules and created a plan for better utilization of their existing resources.

Simulating the Site: A Dream for Various Stakeholders



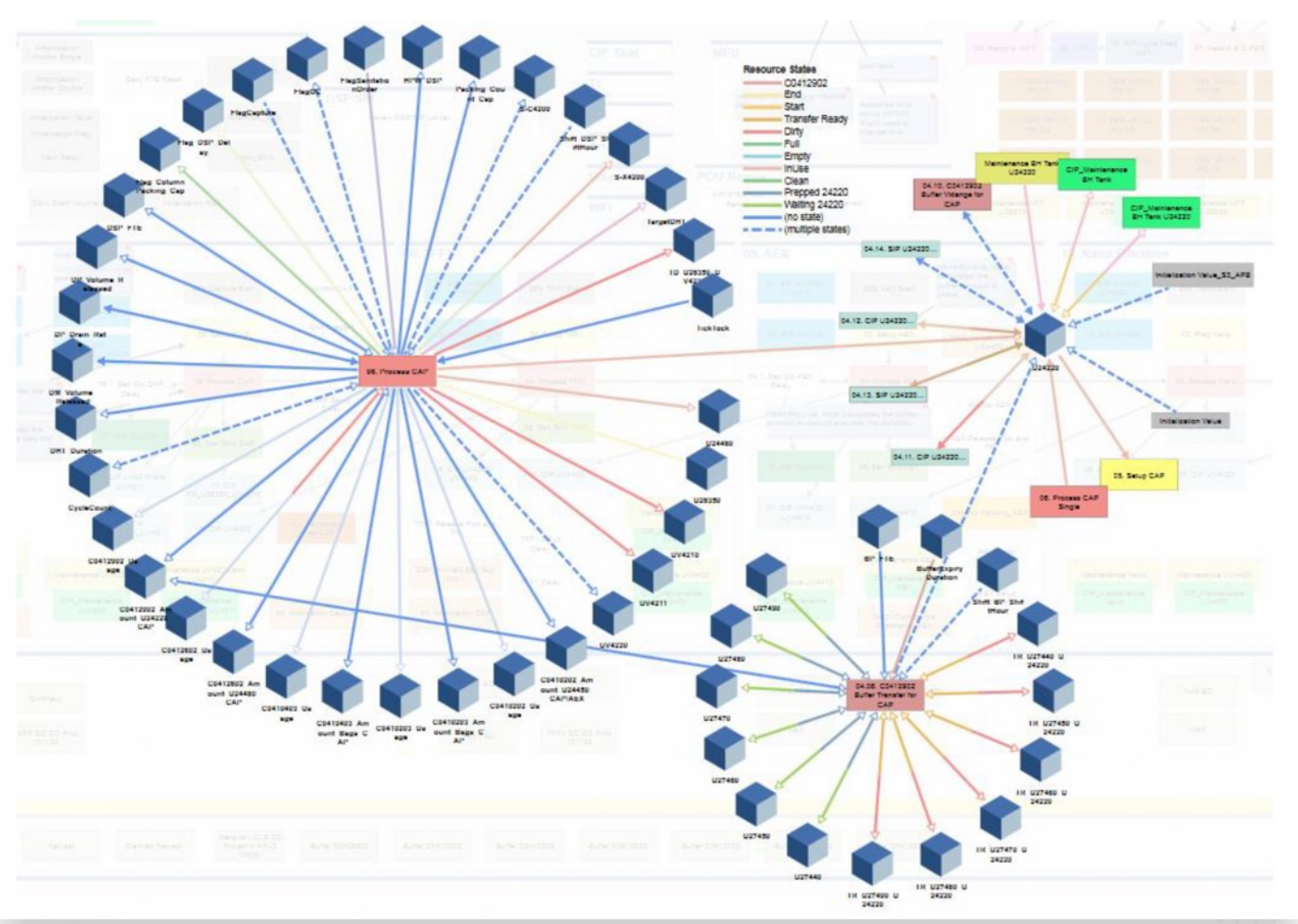
Model Flow Diagram: the End-to-End Process Visibility

- Model Flow diagram is the key element to design all activities that can be regrouped per main process steps

- A model can have thousands of activities and resources that interact with each other to resolve conflicts

Models can be phased based on the level of sophistication needed; here is a phase 1 model

Rotary Dial: Our Designer Can Manage the Model Complexity

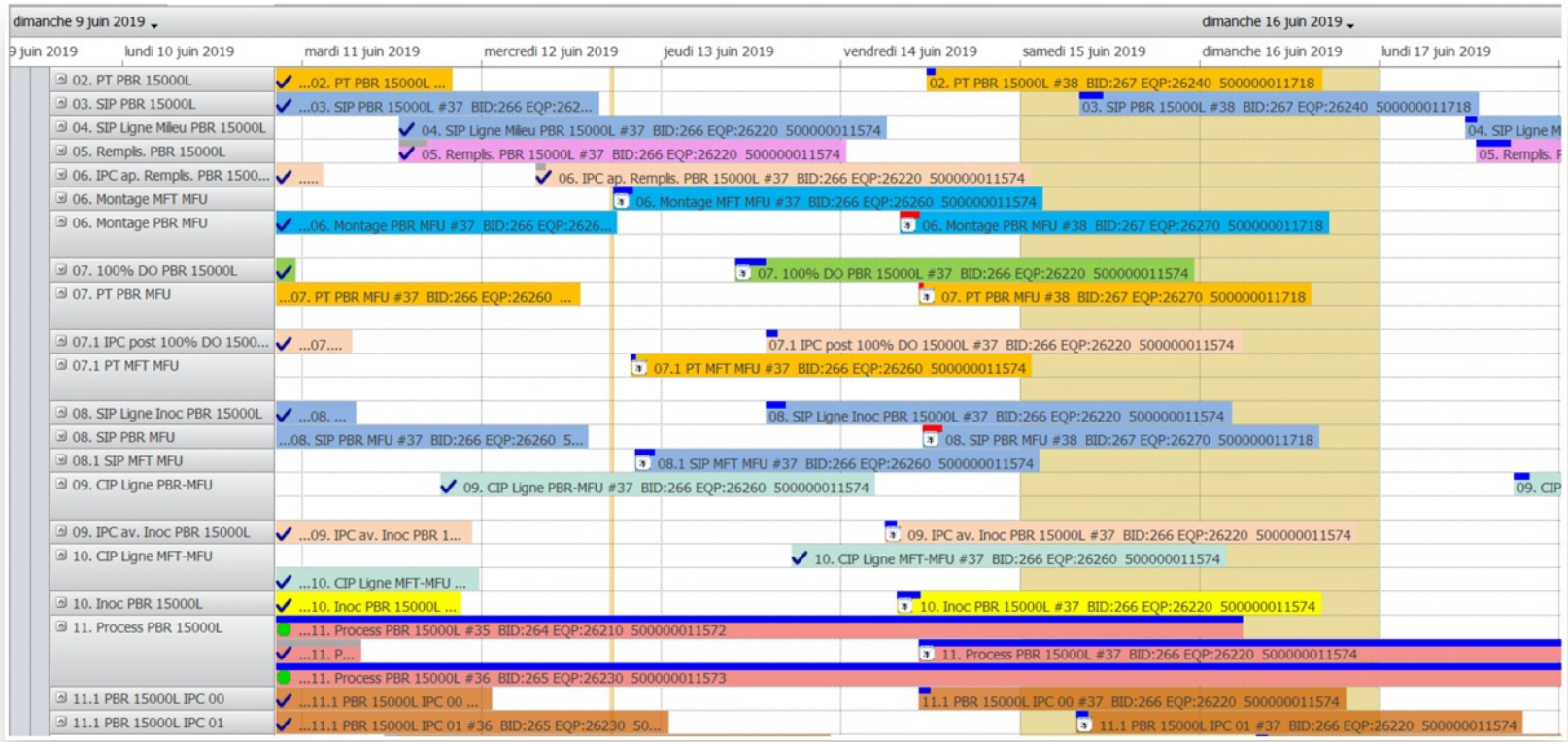


- The model has a deeper level of complexity that maps the resources associated with each activity
- Resources can be shared between different activities which can lead to conflicts when scheduling

The graph is showing interaction of 1st Downstream step with all the related resources

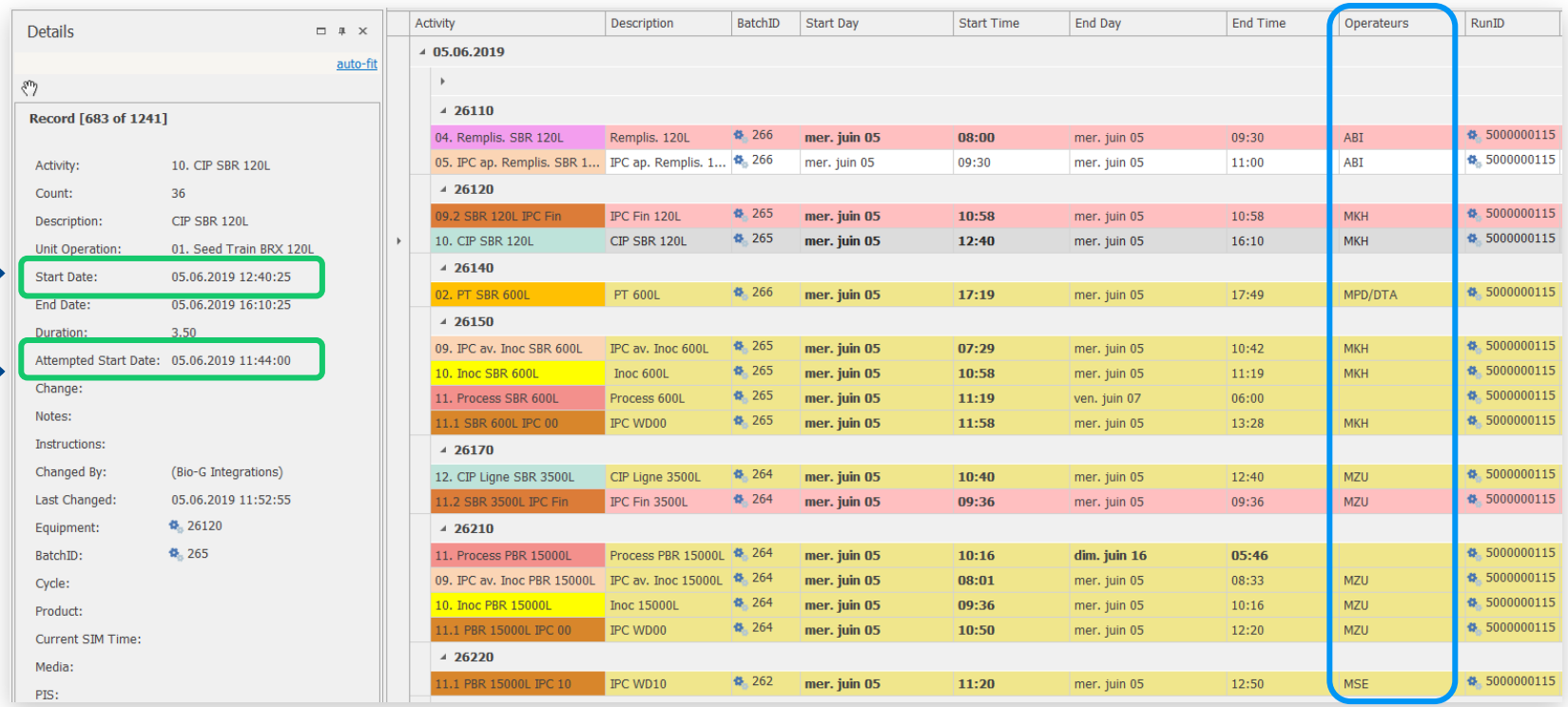
The Gantt Schedule View: To Manage Our Operations

- As an output of the model, it gives schedule slots and sequences per custom functional areas
- Shows past, present, future activities and status for an easy review of late activities
- It proposes the best slots for rescheduling activities
- Schedule moves automatically in real time in case of a delay on the critical path via integrations



The Gantt chart Upstream view of Suite 4

The Worklist: To Guide the Shop Floor in One Source of Truth



Activity	Description	BatchID	Start Day	Start Time	End Day	End Time	Operateurs	RunID
05.06.2019								
26110								
04. Remplis. SBR 120L	Remplis. 120L	266	mer. juin 05	08:00	mer. juin 05	09:30	ABI	5000000115
05. IPC ap. Remplis. SBR 1...	IPC ap. Remplis. 1...	266	mer. juin 05	09:30	mer. juin 05	11:00	ABI	5000000115
26120								
09.2 SBR 120L IPC Fin	IPC Fin 120L	265	mer. juin 05	10:58	mer. juin 05	10:58	MKH	5000000115
10. CIP SBR 120L	CIP SBR 120L	265	mer. juin 05	12:40	mer. juin 05	16:10	MKH	5000000115
26140								
02. PT SBR 600L	PT 600L	266	mer. juin 05	17:19	mer. juin 05	17:49	MPD/DTA	5000000115
26150								
09. IPC av. Inoc SBR 600L	IPC av. Inoc 600L	265	mer. juin 05	07:29	mer. juin 05	10:42	MKH	5000000115
10. Inoc SBR 600L	Inoc 600L	265	mer. juin 05	10:58	mer. juin 05	11:19	MKH	5000000115
11. Process SBR 600L	Process 600L	265	mer. juin 05	11:19	ven. juin 07	06:00		5000000115
11.1 SBR 600L IPC 00	IPC WD00	265	mer. juin 05	11:58	mer. juin 05	13:28	MKH	5000000115
26170								
12. CIP Ligne SBR 3500L	CIP Ligne 3500L	264	mer. juin 05	10:40	mer. juin 05	12:40	MZU	5000000115
11.2 SBR 3500L IPC Fin	IPC Fin 3500L	264	mer. juin 05	09:36	mer. juin 05	09:36	MZU	5000000115
26210								
11. Process PBR 15000L	Process PBR 15000L	264	mer. juin 05	10:16	dim. juin 16	05:46		5000000115
09. IPC av. Inoc PBR 15000L	IPC av. Inoc 15000L	264	mer. juin 05	08:01	mer. juin 05	08:33	MZU	5000000115
10. Inoc PBR 15000L	Inoc 15000L	264	mer. juin 05	09:36	mer. juin 05	10:16	MZU	5000000115
11.1 PBR 15000L IPC 00	IPC WD00	264	mer. juin 05	10:50	mer. juin 05	12:20	MZU	5000000115
26220								
11.1 PBR 15000L IPC 10	IPC WD10	262	mer. juin 05	11:20	mer. juin 05	12:50	MSE	5000000115

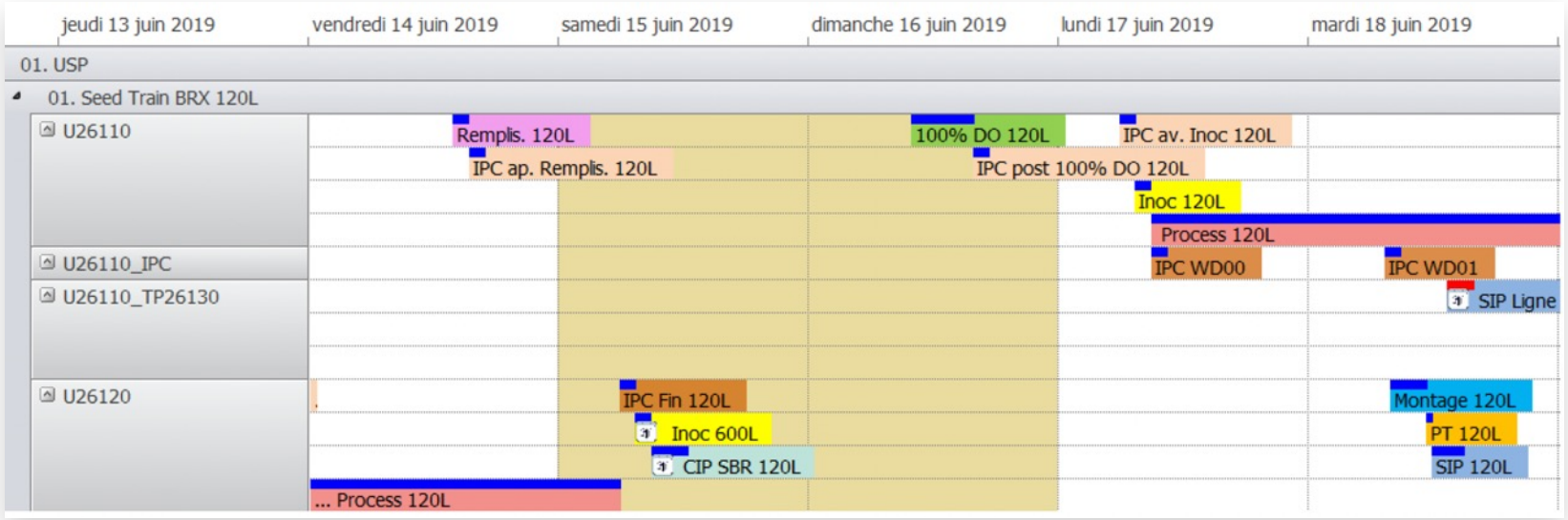
The worklist of Suite 4, actual dates come from MES

For each activity:
Displays original planed date and eventual deviations

- Views can be customized for operators and assigned to specific users on the plant floor
- Team leads can use this view to assign tasks

Equipment Availability: To Prevent Production & Maintenance Conflicts

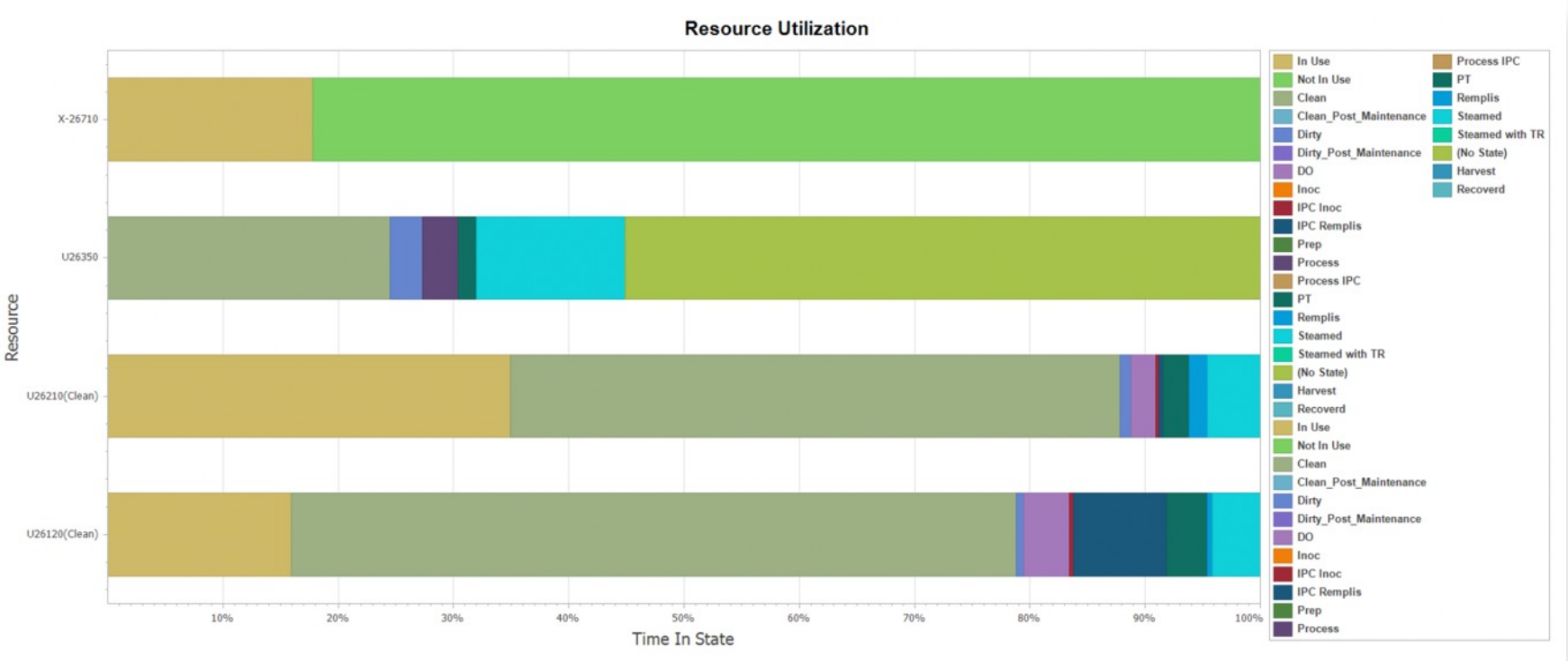
- White spaces indicate equipment's availabilities to facilitate maintenance planner's decisions
- Maintenance teams can grab whitespace manually or automatically assign cleaning activities



A Seed Bioreactor white space

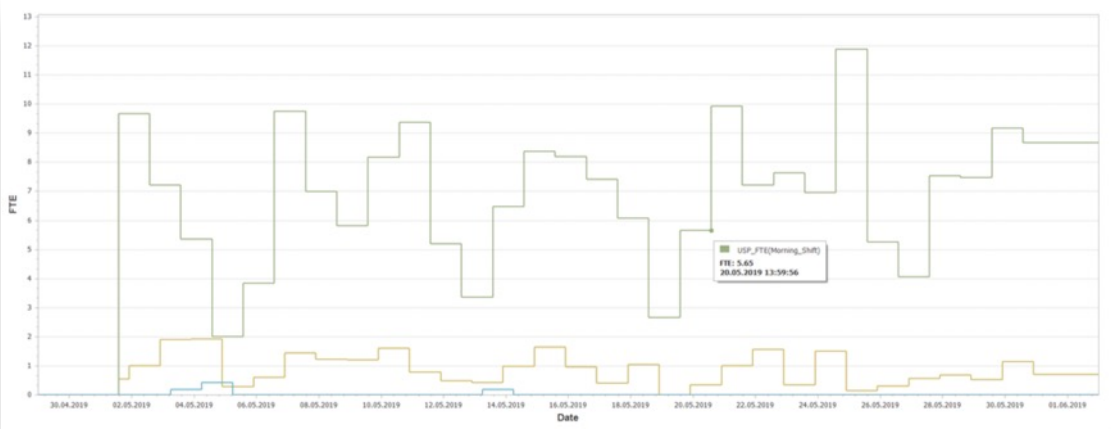
White space for equipment U26120

Equipment Capacity Utilization: To Analyze Our Bottlenecks

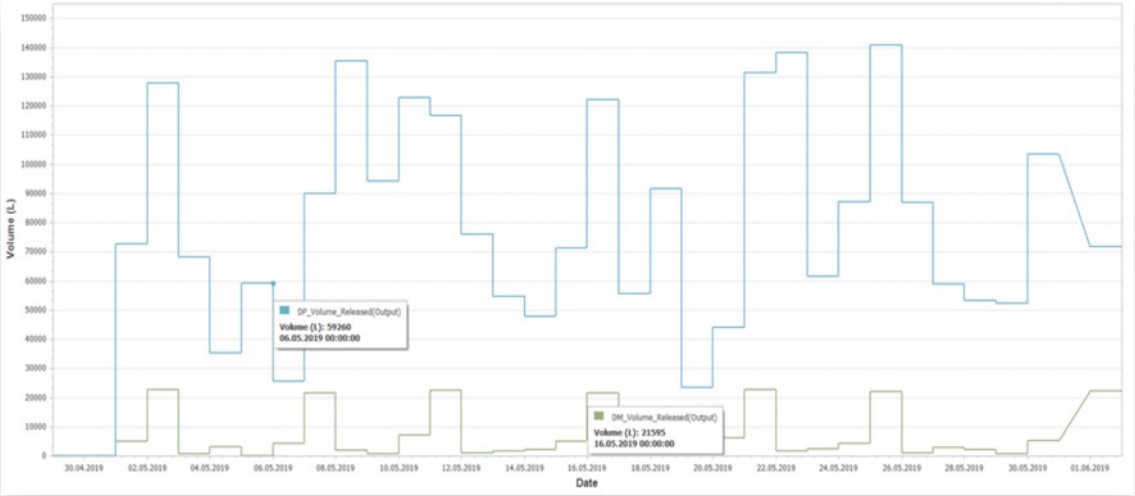


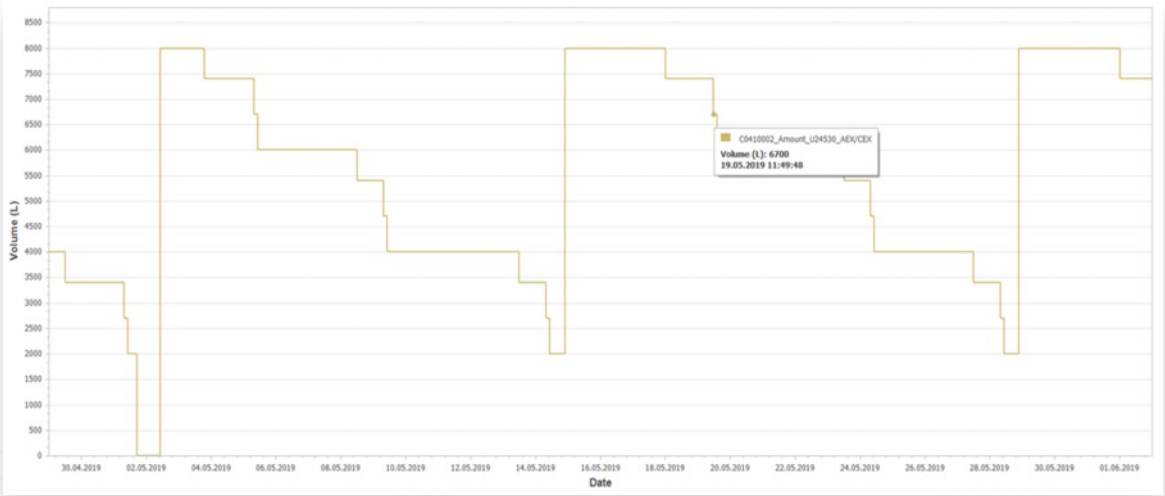
- Displays the capacity utilization breakdown per state
- They are used for debottlenecking purposes by production and engineering

Step Plot: To Manage Our Labor & Utilities Resources



- Manpower, waste, HPW, WFI, Buffer Consumption are modeled as resources per activities
- The step plot is giving the related forecast consumption
- It is used on a weekly/daily basis to manage workload vs. capacity per teams





Summary: End-to-End Planning System Incorporates Strategic Considerations

Project Takeaways

By creating a single source of truth, the site was able to automatically create a self-driven schedule that is always up-to-date. Shift leads were able to assign tasks to their teams at shift huddles, and maintenance was able to view whitespace windows for various activities.

This led to an optimized production process where everyone knew what to do and when to do it. Once live, the model identified potential process improvement activities.