Resources Optimization and Capacity Analysis in Electronics Manufacturing Industry - Case Study

Summary

Client Organization is the service leader in the electronic interconnect industry. It is a privately held, global supplier of interconnects, cable assemblies, and design solutions. Products include high-speed board-level interconnects, high-speed cable assemblies, optical systems, mid-board and panel optics, glass core technology, and the industry's largest variety of board-to-board interconnects.

Aims/Objectives

- Understand machines needed to meet target demand.
- Identify Bottlenecks
- Check for benefits from scheduling.
- Effective utilization or optimization of resources.
- Feasibility Check for monthly production

Key Points

- Current Facility monthly volume can be completed in 15 days.
- Scope to reduce machines and work only 8 hour shifts.
- Capacity expansion of up to 3 times with current equipment
- Scheduling has less impact with current SKU variants

Client's Challenge

- Varied Product Demands
- Upper production limit from current facility
- Shift patterns to be followed
- Bottleneck areas
- Storage between production areas
- Batch based lead time

PMI's Approach.

The study was organized in a 6-stage process:

1. Data Verification and Static analysis
2. Conceptualization
3. Model Building and verification
4. Validation
5. Testing Scenario's
6. Results and Conclusion

Data Verification and Static analysis – Check data provided by client, analyse information and theoretically estimate the possible utilization and output from the system.

Conceptualization – Understand all parameters, rules and possible changes in the manufacturing system. Come up with a flexible model building method to quickly accommodate possible changes.

Model Building and Verification – Using Simulation software, build and check behaviour of model against static analysis.

Validation – Test simulation model with past performance data from facility.

Testing Scenario's – Tweak parameters and analyse the model to bring value to current facility.

Results and Conclusion – Optimization of machines, shifts. Tabulate all scenario's tested for client reference.

Involvement of Associates –

- PMI – 1 Project Manager, 1 Engineer.
- Client – 1 Project coordinators.

Static Analysis -

- Analyse machines considering details of monthly target volume cycle time, batches and yield.
- Summarize possible shift patterns to be tested.
- Machines Utilization

	Min	Max
# of Batches to meet Volume	112	740
Body Fill Hrs of Production required (hrs)	98.8	158.4
SB Hrs of Production required (hrs)	310.5	
PKG Hrs of Production required (hrs)	63.3	

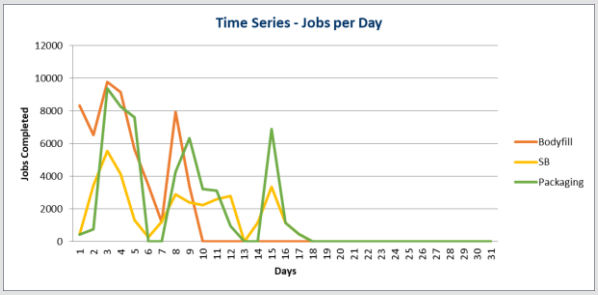
Possible Shifts	Hours/Shift
8 Hour Day	5.92
10 Hour Day	7.42
Off-Shift Day	0.00
12 Hour Day	9.42
12 Hour Night	9.42
Off-Shift Night	0.00
Half 12 Hour Night	9.42

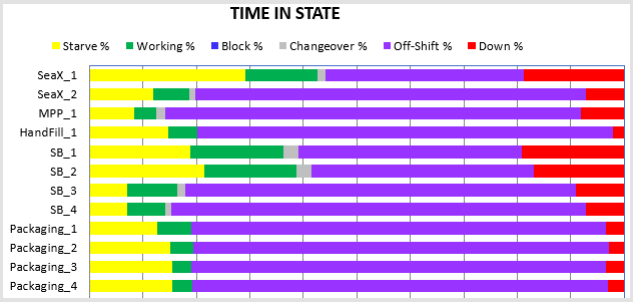
Machine Name	Utilization
SeaX_1	27.5%
SeaX_2	23.7%
MPP_1	15.8%
HandFill_1	24.6%
SB_1	37.8%
SB_2	32.4%
SB_3	40.7%
Packaging_1	20.7%
Packaging_2	20.7%
Packaging_3	20.7%
Packaging_4	20.7%

Finding & Recommendations

After doing analysis and evaluation following results were obtained –

1. In existing condition, monthly target is completed in 15 days.
2. Machines Utilizations studied.





3. We can produce up to 3 times the required volume by changing shifts.
4. Detailed tracking of lead times, WIP and batch wise information at every stage is done to get a more holistic understanding of the system.
5. Model is flexible to add more machines, change shifts and variants to quickly study all required variable parameters (Cycle times, downtimes and changeovers).

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