

Overall Equipment Effectiveness (OEE) Digital Tool

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- Maximize production effectiveness of manufacturing operations.
- Free up capacity, decrease time to produce and better manage equipment/capital

Solution:

- The OA/OEE digital tool is a production effectiveness measuring, monitoring and visualization tool.
- Automates and standardizes Data/Calculations/Output

Results:

- The OA/OEE digital tool was piloted at a filling facility for vaccines, biologics and small molecule DP within our global network.
- Achieved results examples: (1) Significant decrease of turnaround variability (2) Identification of key improvement opportunities: materials, specific turnaround stages



Background

Background - What is OA & OEE?



OA and OEE are industry metrics for measuring production effectiveness in manufacturing operations.

- OA: Operational Availability
- OEE: Overall Equipment Effectiveness

Essentially, **OA and OEE** are a measure of how well a manufacturing operation is utilized compared to its full potential. An OEE score of 100% represents perfect production, with no losses or downtime.

By measuring OEE and the underlying losses, important insights on how to systematically improve the manufacturing process can be gained. Additionally, by comparing OA and OEE facility metrics to the industry benchmarks the state of the manufacturing operation can be assessed in the context of the industry at large. For capacity constrained manufacturing plants meeting and exceeding the industry benchmarks is the goal.





Understanding the Challenge

Let's consider the output of a hypothetical facility







Understanding the Challenge







Understanding the Challenge

How to...



- Establish Current State?
- Identify Improvement Areas?
- Measure Impact of Improvements?



There is a production improvement standard for that...

+ Digital tool: automation/visualization



Production Effectiveness Measurement



The **OA/OEE** digital tool is a production effectiveness measuring, monitoring and visualization tool.



'Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it.' – James Harrington

Measuring and monitoring **OA/OEE** in conjunction with a process improvement program



- Frees up capacity
- ✓ Decrease time to produce
- ✓ Better manage equipment/capital



Production Effectiveness Measurement



The **OA/OEE** digital tool automates and standardizes – Data/Calculations/Output

Shop Floor Mfg. Systems

The **OA/OEE** digital tool

Replaces:

With:

es: Manual, time-consuming processes, and after the fact downtime reporting

Near real time shopfloor screens, real time manual input downtime tool and detailed continuous improvement analytics.





Standardized outputs MERCK

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Solution

Real Time Monitoring



Highlights performance issues in near real time enabling the team to take timely action Continuous Improvement Analytics



Visualizes historical performance with drilldown capabilities







Solution

Real Time Monitoring

(1)

By measuring and visualizing production effectiveness in near real time shop floor personnel can:

- Spot problems quickly to minimize downtime
- Identify opportunities to reduce losses and improve production effectiveness.



Main Screen 100% 100% -2.38 hr



Manual Downtime Input

- Using the manual downtime input screen shop floor personnel allocate in real time downtime events to the appropriate reason code
 - This data is then used to determine the root cause of capacity losses and identify areas for continuous improvement



Continuous Improvement Analytics

OEE/OA and related turnaround performance/downtime analysis/losses analysis are used to:

- Determine the root causes of productivity losses
- Identify ways to improve production line or plant capacity utilization.
- Measure impact of project improvement initiatives







Results:

- The OA/OEE digital tool was piloted at one of our DP facilities, a filling facility for vaccines, biologics and small molecule drug product within our global network.
- Achieved results examples:
 - Significant decrease of turnaround variability = time saved per batch = extra volume produced.
 - (2) Identification of key improvement opportunities: materials, specific turnaround stages = downtime reduction = time saved per batch = extra volume produced.







Thank you

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