Blueprint Intelligence

A Case Study

OVERALL EQUIPMENT EFFECTIVENESS (OEE)

A Background

Overall Equipment Effectiveness (OEE) is a gold-standard measurement of productivity for asset intensive operations including mining, manufacturing and supply chain.

Three key asset metrics combine to paint the picture of OEE commonly used by rail companies to measure performance against industry benchmarks:

- Asset Availability
- Asset Utilization
- Asset Reliability

That's because these benchmarks each have a critical impact on service delivery and present a systematic means for drilling down to problem areas that affect performance.

In industries where operations run 24-7, and where unscheduled interruption to production represents hundreds of thousands or even millions of dollars for the company and its shareholders, OEE is the guiding light for all levels of the organisation.

Further, if you're hitting optimum availability, utilization and reliability – represented as a percentage – your operation is at its maximum capacity without stoppages due to scheduling issues or breakdowns. By optimising reliability, you're also efficiently managing costs over the asset lifecycle and minimising safety risks associated with equipment failure.

These metrics have a material impact on planning for asset maintenance, production or throughput and operational costs. As such, they're important for corporate reporting to shareholders, the board and for functioning at all levels of the organization.

Accurate, and easy to understand visibility into these key metrics is also critical for all levels of the operation.

Examples include:

- **Maintenance crew** can get a visual on problem equipment and schedule work with minimum interruption to availability requirements for production.
- **Operations** get to know what equipment is available for production or throughput – using this information to schedule people or services, and to make projections on sales or output.
- For **Management** to understand how the company is performing on those metrics critical to the execution of services in a safe, efficient and effective manner.
- For all levels of the business to understand where additional resources or attention is required to improve performance.

The Solution

Blueprint Intelligence broke the task of building real-time OEE Analytic down into two teams: Projects and Technical.

Step 1:
The Projects Team focused on the Key Performance Indicators (KPIs) and their componentry. The first challenge was to extract the asset register which was duplicated in SAP and the Yard Systems. There were gaps in these individual databases, contributing to inaccurate data and management issues. Once this information could be used in each of the different databases used in the process, all equipment used in the workflow of production could be tracked according to the following KPIs:

- **Availability**: measured planned and unplanned stops or outages. 100% represents production at 100% of planned output.

- **Utlization**: demonstrates any slower, or lower than expected output due to resourcing or scheduling issues with maintenance, services or equipment.

- **Reliability**: measures any reduced output or production downtime due to unplanned maintenance or equipment failure.

At a Glance

INDUSTRY:
Logistics, Heavy Industry, Mining

PROBLEM:
No insight into Overall Equipment Effectiveness (OEE) was hampering performance across the business, from trades, to C-Suite reporting.

SYSTEMS:
SAP PM, SAP SD, DB2 Mainframe, Rail management system and in-house service planning tool.

SOLUTION:
Blueprint Intelligence Custom Dashboard, ETL, Datawarehouse

RESULTS:
The entire operation - at all levels - started to rely on the OEE analytic on a daily basis to drive their performance and continuous improvement against industry benchmarks and their own baseline performance.

Step 2: The Technical Team identified where the data was stored that would help to measure these metrics.

The first task was the Asset Register. The team cleansed the database of duplicates and outdated files, enhancing the asset register so it could be used to seamlessly integrate all Rail Yard systems and ERP functions.

Next, the team extracted different datasets from the Rail Yard and ERP systems to present a historical measure of OEE across the operation. Not only would this measure the company against industry benchmarks, but it would work as a baseline for future improvement initiatives.

The following data was extracted from various systems to feed into the BI tool, which was a combination of SAP Data Services for data extraction, transformation and data loading, ETL for cleaning and loading data, and Microsoft Power BI which presented the OEE analytic in a dashboard.

- The asset register and historical maintenance data in SAP PM was extracted to provide a picture of reliability
- A status of all trains in the Rail Inventory Control System was captured for the availability metric
- The location of trains and service milestones was extracted to inform utilization
- Distance Travelled and stock loading was extracted from a TMS system which measured train location, destination, and its load according to SLAs. This was critical for measuring productivity for the rail operation based on potential, or hours scheduled for work.
- The SAP Sales Distribution database provided data on sales orders and hours scheduled to jobs.

The Results

The results of this project, after 10 weeks work, presented the client with a near real-time table of all assets with a breakdown available hours, scheduled hours, utilized hours and reliability as a percentage for that month.

At a high level, this information helped to identify if a particular asset was unreliable, or if missed schedules were contributing to underutilization of assets, thereby affecting projected output.

The entire operation started to rely on this analytic on a daily basis to drive their performance.

Users could identify trends month by month, to drill down to capture a visual into each yard, each leg between the mine and the port, the asset and the customer.

This included:

- Teams in the rail yard could use the real-time data in the control rooms to track trains to see where they are compared to where they were scheduled to be to the minute.
- Accounts had more reliable, timely and accurate data for billing purposes
- Operations had insight into problem areas for focused improvement – whether it be scheduling, over commitment to clients, maintenance, or problems with the port or mine being unavailable to meet schedules
- Management could project throughput more reliably
- Maintenance had a better and easier way to prioritise work, and more visibility into how important the asset management role is to the entire operation
- Shareholder reports and regular monthly reporting was reduced to the click of a button
- There was new, positive cohesion amongst the different levels and departments of the operation.

ABOUT US

The Blueprint Intelligence team is team experienced in all major analytics applications and business process improvement.

Our services include end-to-end implementations, specialized projects and managed services.

We're different to alternative contractors because we build a solution that solves your immediate issues, and meanwhile improves systems so you gain a sustained continuous improvement.

This strategic approach delivers a solid return on your investment in analytics. Meanwhile, you enjoy the flexibility of our service, and accessibility of our fees.

For more, visit bpintel.com and follow us on LinkedIn.