Honeywell

Case Study

Production Manager Enabled BHP Billiton Mitsubishi Alliance to Streamline their Information Management System

Challenge

BHP Billiton Mitsubishi Alliance (BMA) need to meet their processing five-year goals, which included:

- Increased run hours
- Increased plant feed rates
- Yield maximization
- Product quality improvement
- Technology and innovation
- Improving train loading times
- Controlling product loss in the cyclones (density control)

Solution

Production Manager was chosen to provide production accounting for the seven processing plants including train loading facilities and stockpile operations.

Production Manager is Powered by Matrikon, which represents vendor neutrality. This product works with third-party control systems and applications.

Advantage

- Eliminated up to 95% of manual data entry
- Improved the timeliness of standardized reports
- Eliminated data integrity risk associated with numerous disparate spreadsheets
- Provided seamless integration with rail service providers and off-site laboratories
- Provided state-of-the-art, web-based analysis tools needed to improve plant operations

About BHP Billiton Mitsubishi Alliance

BHP Billiton Mitsubishi Alliance (BMA) is Australia's largest coal miner and exporter and the world's largest supplier to the seaborne coking coal market. BMA is a 50/50 alliance between the world's largest diversified resources company - BHP Billiton - and the world's largest general trading company - Mitsubishi. Combined, the two owners employ more than 84,000 people and have operations in more than 80 countries.

Hurdles

In 2005 it was determined that seven of the BMA Coal processing plants would increase production throughput and improve product yield by implementing a Manufacturing Execution System (MES) consisting of historian infrastructure and related applications. In 2006, with a plant historian implementation underway, BMA sought a commercial off the shelf (COTS) replacement for its Process and Dispatch Module (PDM) that would allow connectivity to the historian and provide the flexibility and reliability to enable BMA to meet their processing five-year goals such as:

- increased run hours
- increased plant feed rates
- yield maximization
- product quality improvement
- technology and innovation
- improving train loading times
- controlling product loss in the cyclones (density control)

The PDM was a central component of BMA's in-house corporate Mine Information Centre (MIC) business system. This legacy system was becoming increasingly difficult to maintain and fell short of the desired connectivity requirements. The replacement system should provide all existing PDM functionality and seamless integration with external business partners as well as internal business systems.

The new system was browser-enabled and centrally located at BMA corporate headquarters in Brisbane, Australia. It was initially developed for BMA's Goonyella and Riverside plants which were identified as having the most complex operations.

An ongoing roll-out would then be executed in the other five sites throughout Australia. The BMA Information Systems group formed the CPP Historian/Applications Implementation Program (CHIP) project team. This team managed the historian and application vendors for a successful implementation.

BMA chose Production Manager to replace the PDM in Q1 2006 and to form a key element of the new MES. The project required the new Goonyella and Riverside systems to be implemented by Q4 2006. Due to this accelerated and intense deadline, Honeywell believed that it was necessary to relocate the core project team members from various Australian offices to BMA's corporate offices in Brisbane for a period of up to 10 months. Supported by remote team members who assisted with both significant product development changes and application configuration, the project was successfully completed in late 2006.

Solutions/Products Implemented

Production Manager was chosen to provide production accounting for the seven processing plants including train loading facilities and stockpile operations. Production Manager includes the following modules.

- Production Accounting
- Downtime Reporter
- Plan Manager
- Materials Manager

A separate Production Manager server was installed on the corporate server for each of the seven coal preparation plants. Connectivity between these systems and the corporate historian was achieved by installing the Production Manager data transaction engine MOReLink and MatrikonOPC's HDA server software for PHD on the historian server. This combination provided a reliable and robust store-and-forward data service. Operational Insight was chosen to provide web-based trending with a Microsoft® Excel® add-in for the visualization of both historian and Production Manager data for ad-hoc analysis.

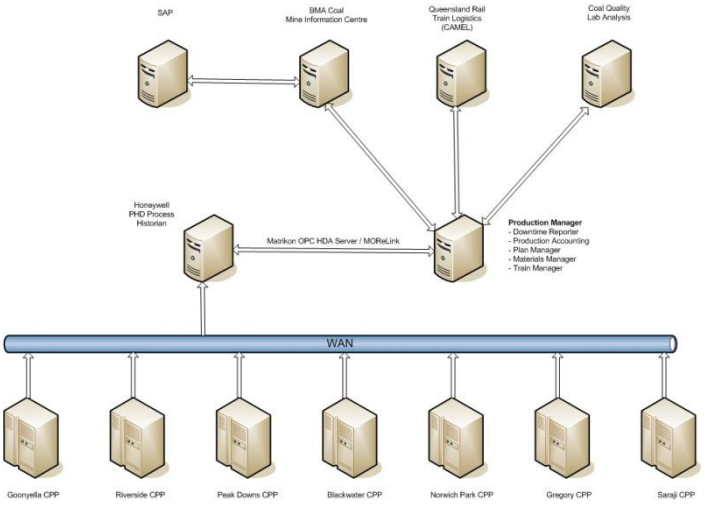


Figure 1 - System Architecture

Production Accounting

Various templates were configured within the Production Accounting module to automatically collect plant operating data on an hourly basis. It also provided a user interface to record coal sample analysis results from both on-site and off-site laboratories. Validation rules were configured to ensure data cleansing of entered data and were compiled from predefined business rules. Configured calculations provided the standard aggregation on tons and weighted coal qualities which were rolled up to various time-based measurements including shift, daily and weekly production templates.

By tracking production campaigns for different feed and product types, BMA staffs were able to analyze production performance such as yield, quality and throughput relative to those types which provided increased visibility to their process performance.

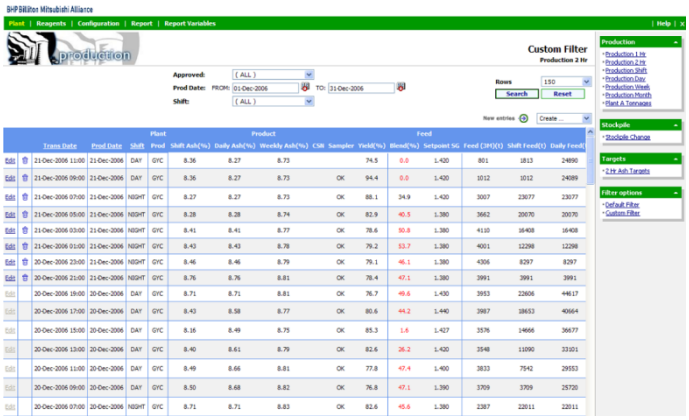
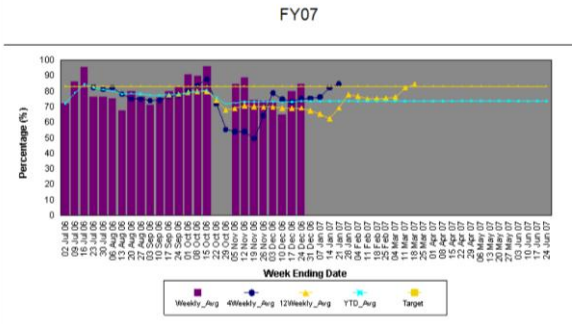


Figure 2 - Production Accounting Template

Reporting

Many tabular and graphical reports were configured to provide on-demand reporting and analysis. The report data source and presentation format can be customized to provide the required information perspective.

To ensure that reports were both accurate and timely, the Production Accounting templates were preloaded with historical data from PDM. This enabled the accurate comparison of both PDM and Production Accounting reports and calculations.



Week Ending	Target Avg	Weekly Avg	4 Wk Moving Avg	12 Wk Moving Avg	YTD Avg
02 Jul 06	83	72			71.95
09 Jul 06	83	86			78.88
16 Jul 06	83	95			84.36
23 Jul 06	83	76	82.27		82.27
30 Jul 06	83	76	81.04		81.04
06 Aug 06	83	75	81.68		80.06
13 Aug 06	83	67	78.01		78.26
20 Aug 06	83	80	74.92		78.46
27 Aug 06	83	76	74.92		78.18
03 Sep 06	83	71	73.87		77.45
10 Sep 06	83	76	74.00		77.31
17 Sep 06	83	80	76.49	77.52	77.52
24 Sep 06	83	83	77.04	77.92	77.92
01 Oct 06	83	91	80.01	79.37	78.84

Figure 3 - Weekly Performance Rating

Product Dispatch - Train Manager

The efficient and effective management of train loading operations on site was a primary consideration for BMA. Train Manager's seamless integration with a major Australian rail logistics information system (CAMEL) provides timely and accurate updates on train schedules and consignment planning.

Loading operations are recorded and matched against the scheduled trains to provide a complete planning and loading information system.

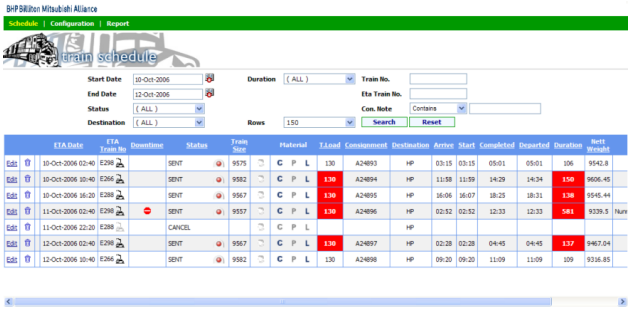
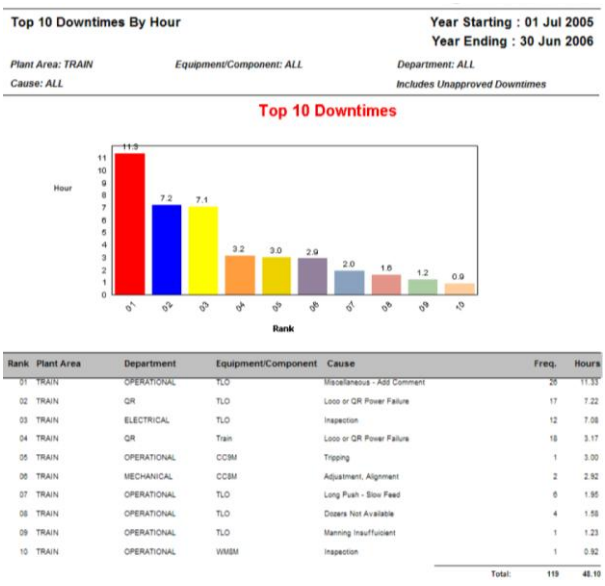


Figure 4 - Train Schedule

Downtime Reporting

The Downtime Reporter module records delays to train loading operations and provides a user friendly interface for staff to assign a cause for each downtime occurrence.

These downtimes are then analyzed through a suite of downtime reports which can highlight systemic problems that may be reducing the facilities operational performance



Rank	Plant Area	Department	Equipment/Component	Cause	Freq.	Hours
01	TRAIN	OPERATIONAL	TLO	Miscellaneous - Add Comment	26	11.33
02	TRAIN	QR	TLO	Loco or QR Power Failure	17	7.22
03	TRAIN	ELECTRICAL	TLO	Inspection	12	7.08
04	TRAIN	QR	Train	Loco or QR Power Failure	18	3.17
05	TRAIN	OPERATIONAL	CCBM	Tripping	1	3.00
06	TRAIN	MECHANICAL	CCBM	Adjustment, Alignment	2	2.92
07	TRAIN	OPERATIONAL	TLO	Long Push - Slow Feed	6	1.95
08	TRAIN	OPERATIONAL	TLO	Dozers Not Available	4	1.58
09	TRAIN	OPERATIONAL	TLO	Manning Insufficient	1	1.23
10	TRAIN	OPERATIONAL	WMBM	Inspection	1	0.92
				Total:	119	48.10

Figure 5 - Top 10 Downtime Report

Asset Performance

Various asset performance KPIs such as availability, utilization, MTBF, MTTR and Overall Equipment Effectiveness can be calculated from downtime information for any given date range. These KPI reports provide an accurate and timely scorecard of the asset's performance.

KPI Report from 14-Mar-2006 to 14-Mar-2007

KEY PERFORMANCE RESULTS:

Key Performance Points	Actual Value
Calendar Time	8,784.0
Required Time	8,772.0
Available Time	8,734.5
Equipment Downtime	37.5
Production Time	8,696.6
Downtime	75.4
Process Downtime	37.9
Standby Time	12.0
Process Uncheduled Downtime	37.8
Process Scheduled Downtime	0.1
Equipment Uncheduled Downtime	37.5
Equipment Scheduled Downtime	0.0
Equipment Availability	99.6%
Process Utilisation	99.6%
Total Utilisation	99.0%

Figure 6 - KPI Report

Project Achievement

With the initial deployment for the Goonyella and Riverside systems successfully completed in late 2006, the system has proven its flexibility and reliability in not only meeting its initial objectives of providing all PDM functionality. It has also exceeded their goals by:

- eliminating up to 95% of manual data entry
- improving the timeliness of standardized reports
- eliminating data integrity risk associated with numerous disparate spread sheets
- providing seamless integration with rail service providers and off-site laboratories
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With this successful result, BMA is now moving to replicate Honeywell's solution at a further five sites, commencing with Peak Downs and the new Blackwater facility.

For More Information
Learn more about how Production Manager can streamline Information Management System, visit our website www.honeywellprocess.com/software or contact your Honeywell account manager.

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