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Asset Intensive | Retail & Fashion
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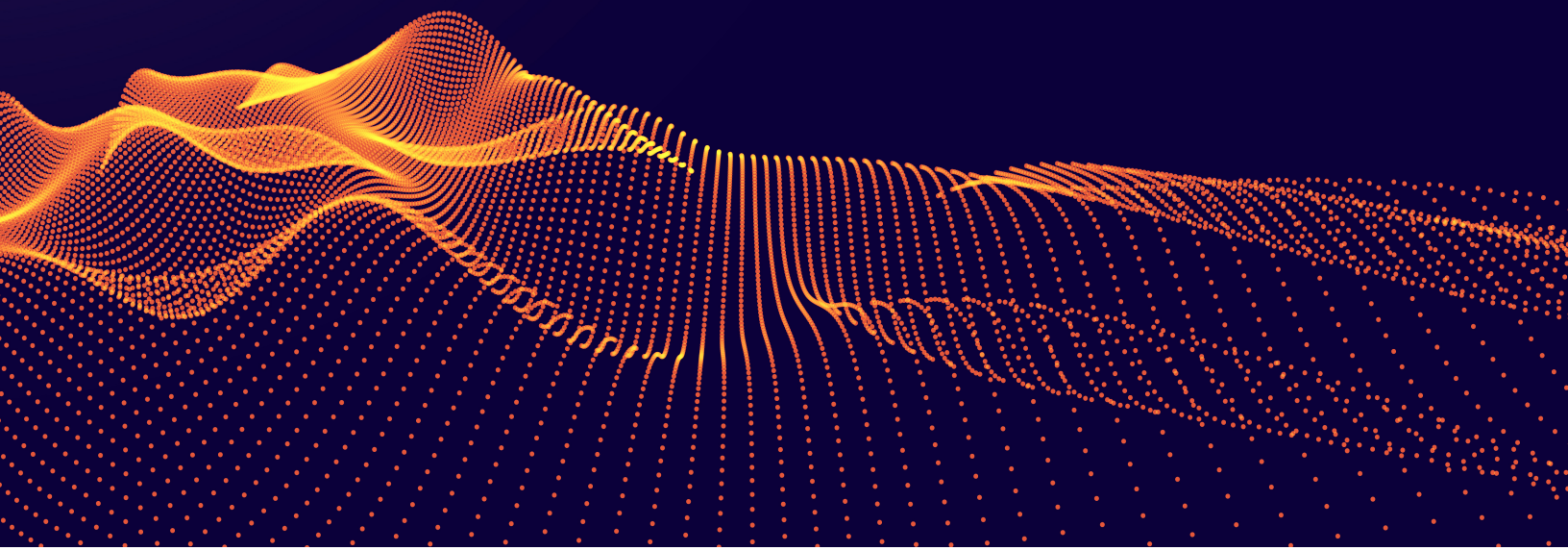

ENTERPRISE ASSET MANAGEMENT

THE DEVIL IS IN THE *DATA*

Whitepaper
March 2020

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Perfect Data, Perfectly Possible

EXECUTIVE SUMMARY

Enterprise asset management (EAM) is a strategy to provide an optimal approach for the management of the physical assets of an organization to maximize value. It covers items such as the design, construction, commissioning, operations, maintenance and decommissioning/ replacement of equipment and facilities. **Enterprise** refers to the management of the assets across departments, locations, facilities and, in some cases, business units. By managing assets across the facility, organizations can improve utilization and performance, reduce capital cost, reduce asset-related operating costs, extend asset life and subsequently improve return on assets (ROA).

Asset intensive industries face the harsh realities of operating in highly competitive markets and dealing with high value facilities and equipment where each failure is disruptive and costly. At the same time, they must also adhere to stringent occupational safety, health and environmental regulations. Maintaining optimal availability, reliability and operational safety of plant, equipment, facilities and other assets is therefore essential for an organization's competitiveness.

EAM has evolved from paper based systems to computerized maintenance management systems (CMMS). Maintenance organizations have worked hard to keep pace with ever changing technology. This has taken away from the primary function of daily and preventative maintenance tasks and responsibility. Too often the requirement for managing the system precludes the ability to effectively manage the accountability, performance and efficiency of the maintenance organization. All industries are being faced with increasing pressure to reduce costs related to their maintenance programs. This has led them to take a close look at EAM to insure there is a positive impact on total revenue generation.

This white paper explores the findings and insights gained at the conclusion of an EAM data analysis for a global oil and gas company. On the outset, the client sought to optimize their EAM processes, reduce inventory and improve plant maintenance and operations. They found that key business processes were compromised as a result of incomplete and inaccurate data in the company's production enterprise resource planning (ERP) systems. The knowledge gained provided opportunities for process and business optimization as well as unforeseen benefits related to business insight and decision making.

ENTERPRISE ASSET MANAGEMENT

An EAM methodology is most effective when tailored to your corporation, providing repeatable and sustainable processes. It will address the challenges related to, and maximize how critical assets are managed. It will improve business transactions, financial performance and optimize the useful asset life from procurement through disposal. The implementation of an effective EAM strategy will provide an opportunity for significant cost savings, regulatory compliance, productivity improvement, service level optimization and competitive advantage. Typical improvements achieved with an EAM implementation includes:

ENHANCED ASSET MANAGEMENT

- Ensure accuracy and consistency of the asset register
- Perform detailed maintenance/operating cost analysis and track performance between like and similar assets
- Accurately determine asset value per location and return on investment (ROI) for capital investment
- Facilitate integration between asset register and maintenance equipment register
- Track assets through the full installation-failure-repair-reinstall lifecycle
- Correctly determine “service life” for assets to better reflect existing norms in asset categories
- Insure accurate asset disposal and accountability

IMPROVED MAINTENANCE PLANNING

- Optimize plant maintenance service level agreements (SlAs) and reduce reactive work orders
- Streamline processes related to third party maintenance providers

IMPROVED MAINTENANCE EXECUTION

- Ensure the bill of materials (BOMs) has complete materials to support the work order
- Attach unstructured data, manuals, diagrams, etc. to the work order

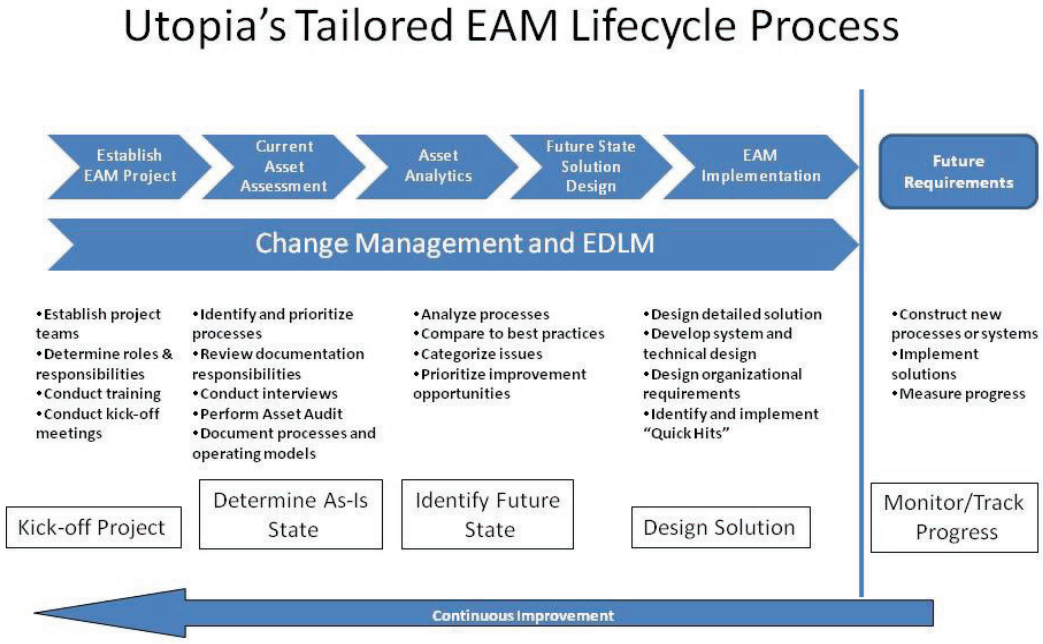
REDUCED SPARE PARTS INVENTORY & HOLDING COSTS

- Determine optimal spare parts inventory thus reducing inventory holding costs through warehouse optimization
- Eliminate obsolete materials not linked to operating assets

ENHANCED STRATEGIC PROCUREMENT

- Develop strategic procurement programs
- Achieve leveraged spend analytics

ESTABLISH ON-GOING METRICS AND REPORTING



CURRENT STATE ASSESSMENT

During the current state assessment workshops are held across all related facilities and departments. Detailed questions are asked to determine the existing asset performance and work processes. This is a thorough analysis which includes current system configuration and architecture, integration points between functional areas, current state of the data quality as it relates to asset definitions, usage, maintenance planning and scheduling, equipment masters and BOMs, inventory accountability, material requirements planning (MRP) as well as the ability to track and monitor daily activities and cost. Data is the primary driver to improved asset management and a Data health Assessment™ (DHA) process uncovers shortcomings in data completeness, consistency, conformity and duplicate identification to aid in the development and facilitation of a sustainable world class future state.

ASSET ANALYTICS

To confirm the existing conditions, data analysis will be performed to validate all quality parameters. Examples of the data parameters include, but are not limited to:

- Completeness of material and equipment descriptions
- Spend analysis for spares
- Occurrences of duplicate records
- Consistent use of standards and control
- Completeness/accuracy of required and optional fields
- Work order histories and completeness
- Bill of material completeness and accuracy
- Procurement practices
- Inventory levels

GAP IDENTIFICATION

After a complete understanding of the current state, a gap analysis is performed. A gap analysis does not imply a shortcoming and should not be taken as a negative reflection on existing operations. **Gaps** are merely differences between the future strategy and processes compared to the current practice. Some differences will warrant attention and proposals for change while others may be entirely appropriate for the circumstances around the business process. A tailored process for achieving best in class EAM will identify those gaps and fully understand the impact to the business processes prior to formalizing a finished solution. Gaps will be prioritized based on the critical impact to the business processes as well as the overall corporate strategy and objectives. By prioritizing the gaps, project plans can be centered on efficient utilization of resources to achieve the maximum benefit in the shortest amount of time.

ESTABLISHING THE FUTURE STATE

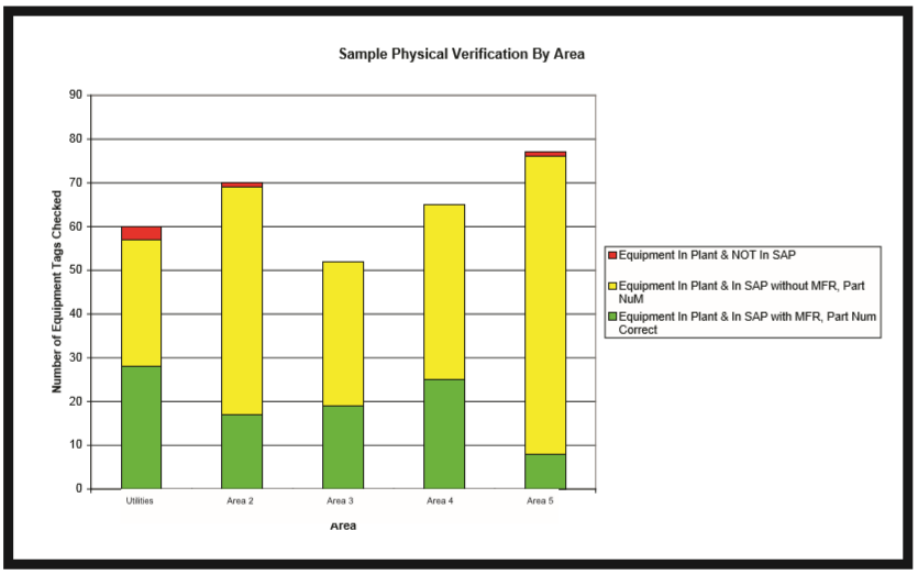
The future state will be defined and developed in comparison with current best practices and standards in the industry. A final assessment will conform to the priorities identified in the design stage. The recommendations are linked to your corporations overall business goals and strategy to insure maximum benefits and improvements can be shared with all stakeholders. To insure the goals are met, tracking and monitoring processes are incorporated to validate the improvements and allow for necessary changes for continued process improvement. Scorecards are established for each critical component of the EAM process to insure the long-term ROI. EAM is a structured process of planning, analyzing, designing and implementation to achieve increased utilization of the corporation's assets. however, there are implications associated with compliance, procurement, and financial benefits that can be linked to EAM to ensure long-term sustainability and collaborative focus across lines of business and stakeholders. A methodology and philosophy must be aligned to these collective benefits in order to be achieved at an enterprise level.

This process drives the business case for change and stakeholder sponsorship.

CASE STUDY - THE DEVIL IS IN THE DATA™

The following are examples of the specific results from an asset information analysis at a global oil and gas company:

EXAMPLE #1: PHYSICAL ASSET VERIFICATION



Equipment recorded on the asset register with correct manufacturer information.....<30%

- Equipment without manufacturer information or incorrect information 70%
- Approximately 1,500 pieces of equipment missing from ERP

This could have an impact when determining the installed base of equipment utilizing specific spare parts to be used during the calculation of the required inventory levels.

Additionally, the business impact of not having assets properly recorded and identified can include:

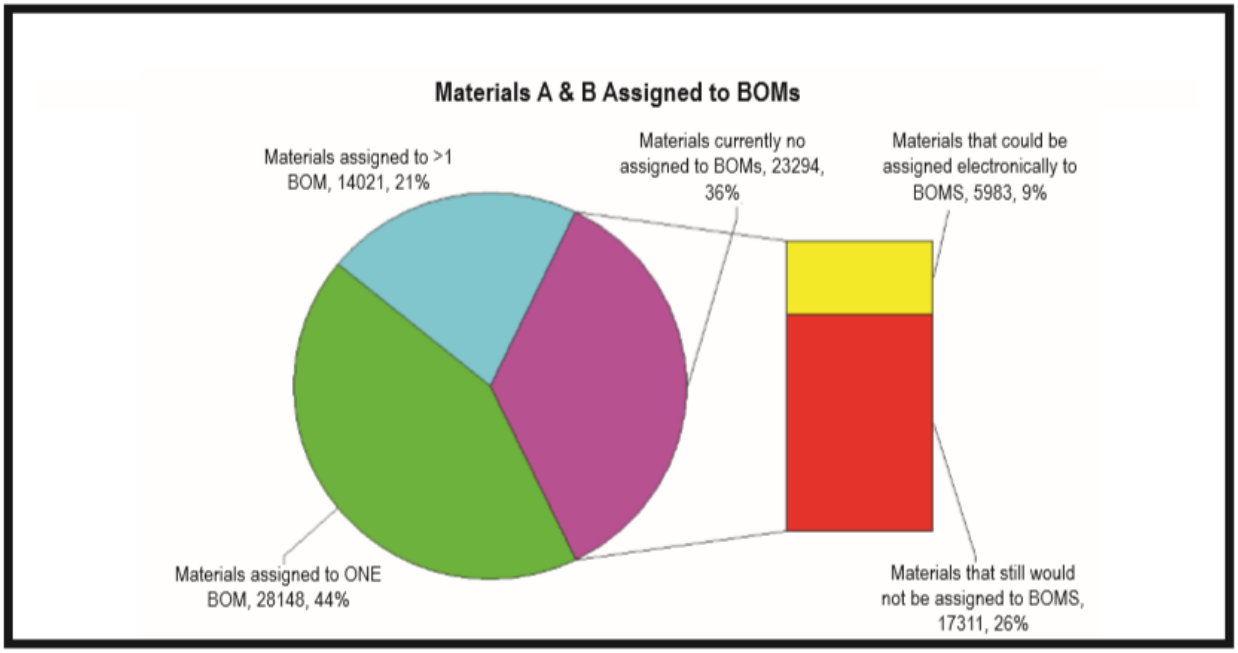
- Tax implications for book value and depreciation
- Maintenance activities will suffer without the possibility to track or establish a preventive maintenance programs
- Missed opportunity for procurement savings and strategic sourcing activities without complete material records and spare parts inventory control
- Spare parts inventory is subject to errors and excessive holding cost
- Inability to determine cross application comparisons for items used on different equipment or within business units. This does not allow for parts sharing between manufacturing facilities or across divisions.

EXAMPLE #2: MATERIAL MASTER ANALYSIS

A review of the completeness of the material master data within the system was carried out as part of the audit. The graph below shows how Materials A and B have been assigned to BOMs.

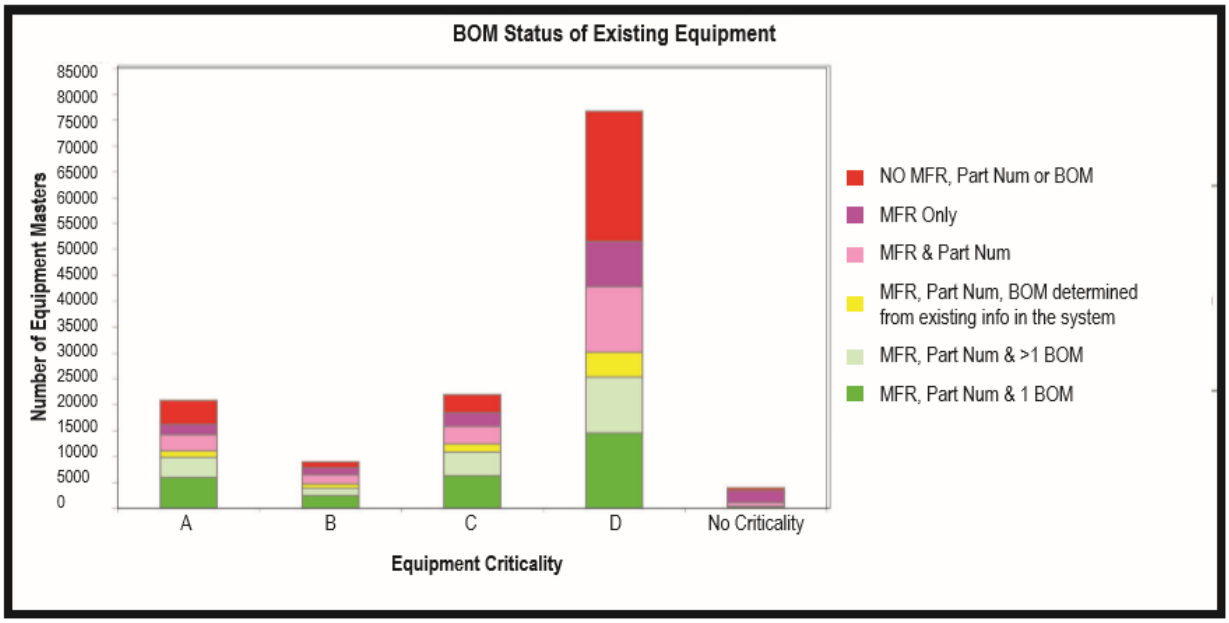
Upon analysis of the material master the following insight was drawn:

- 5%-10% duplicate material masters
- 16% of materials unknown usage
- 44% of materials are UNIQUE spares



The duplicate material masters suggest challenges in procurement efficiencies and overstock of inventory.

The 44% of materials that are identified as unique spares begs the question, “why are they all unique spares?” By analyzing the spares, their functionality and usage history we can look for functionally equivalent maintenance, repair, and operating (MRO) spares and convert unique spares to common spares. This will support a significant reduction in inventory and the related carrying costs as well as provide an opportunity for better strategic sourcing and spend analysis. As common spare part volumes increase, you can negotiate better discounts from your suppliers.



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EXAMPLE #3: BOM STATUS OF EXISTING EQUIPMENT

Based on the analysis the following can be inferred:

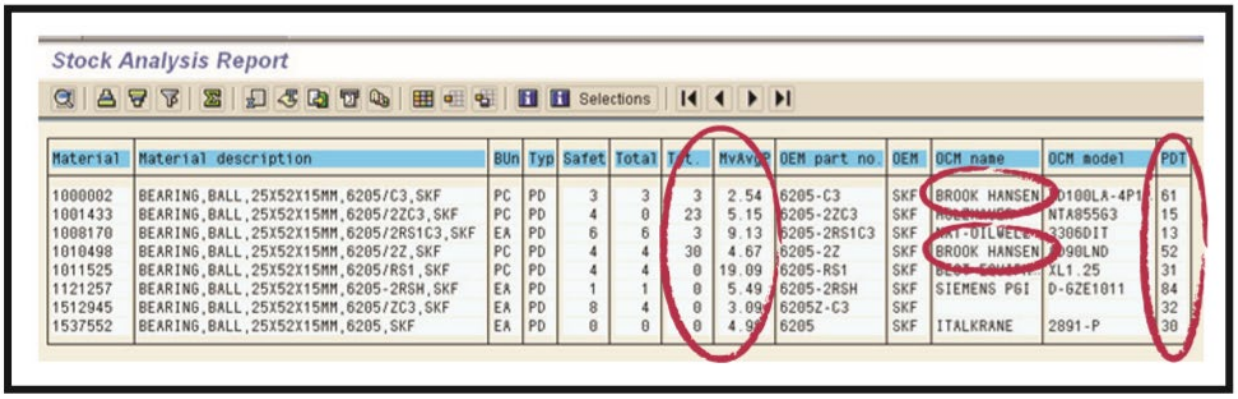
- Only 38% of the equipment have BOMs assigned
- Only 6% have sufficient information available to possibly identify the appropriate BOM
- The remaining items will require manual verification to determine the correct BOM
- 60% of all "D" critical equipment (run-to-failure) do not have a BOM assigned

In some cases the BOMs may already be created but not yet assigned or it may require the creation of new BOMs. Before assigning BOMs or creating new BOMs the following activities need to be performed:

- Standardize material descriptions
- Standardize original equipment manufacturers (OEM) and manufacturer part numbers between material masters and equipment masters
- Apply standard structures for BOMs
- De-duplicate all material master records

The number of critical D type equipment without BOMs (60%) assigned is a concern. These equipment have a run-to-failure maintenance strategy. Therefore there will be no warning time given when spare parts will be required. Not having a BOM means delays in identifying which parts are needed for the work orders and also increases the risk that the required parts will not even be in the storeroom. Plant maintenance execution can be compromised and delayed as a result of this structure.

EXAMPLE #4: DUPLICATE MATERIALS AND THE BUSINESS IMPACT



Material	Material description	BUn	Typ	Safet	Total	Tot.	MvAvg	OEM part no.	OEM	OCM name	OCM model	PDT
1000002	BEARING,BALL,25X52X15MM,6205/C3,SKF	PC	PD	3	3	3	2.54	6205-C3	SKF	BROOK HANSEN	0100LA-4P1	61
1001433	BEARING,BALL,25X52X15MM,6205/2ZC3,SKF	PC	PD	4	0	23	5.15	6205-2ZC3	SKF		NTA855G3	15
1008170	BEARING,BALL,25X52X15MM,6205/2RS1C3,SKF	EA	PD	6	6	3	9.13	6205-2RS1C3	SKF		3306DIT	13
1010498	BEARING,BALL,25X52X15MM,6205/2Z,SKF	PC	PD	4	4	30	4.67	6205-2Z	SKF	BROOK HANSEN	090LND	52
1011525	BEARING,BALL,25X52X15MM,6205/RS1,SKF	PC	PD	4	4	0	19.09	6205-RS1	SKF		XL1.25	31
1121257	BEARING,BALL,25X52X15MM,6205-2RSH,SKF	EA	PD	1	1	0	5.49	6205-2RSH	SKF	SIEMENS PGI	D-GZE1011	84
1512945	BEARING,BALL,25X52X15MM,6205/ZC3,SKF	EA	PD	8	4	0	3.09	6205Z-C3	SKF			32
1537552	BEARING,BALL,25X52X15MM,6205,SKF	EA	PD	0	0	0	4.99	6205	SKF	ITALKRANE	2891-P	30

In the customer case study numerous examples where business benefits, processes and operational efficiencies were compromised due to data inconsistencies were uncovered. The items listed below are required for the criticality "D" equipment identified in the BOM analysis:

In this example there are eight functionally equivalent ball bearings. The lack of MRO standards shows a price range from $2.54 through $19.09 - why would any company pay seven times the premium for a functionally equivalent item? Seven suppliers are listed, two of which are duplicate suppliers and one is not identified. Also notice the duplicate provider has two prices for the functionally equivalent item. It

will be important to identify the differences between the two items to insure they are an exact alternate part or if a separate material master should be created and added to the BOMs for this item.

Without correct data or a sound procurement strategy, there is a direct business impact on the bottom line: a cost savings opportunity has been lost because the lowest cost supplier and optimized inventory levels cannot be identified. Additionally the opportunity for strategic sourcing, spend analysis and intelligent reporting are all compromised.

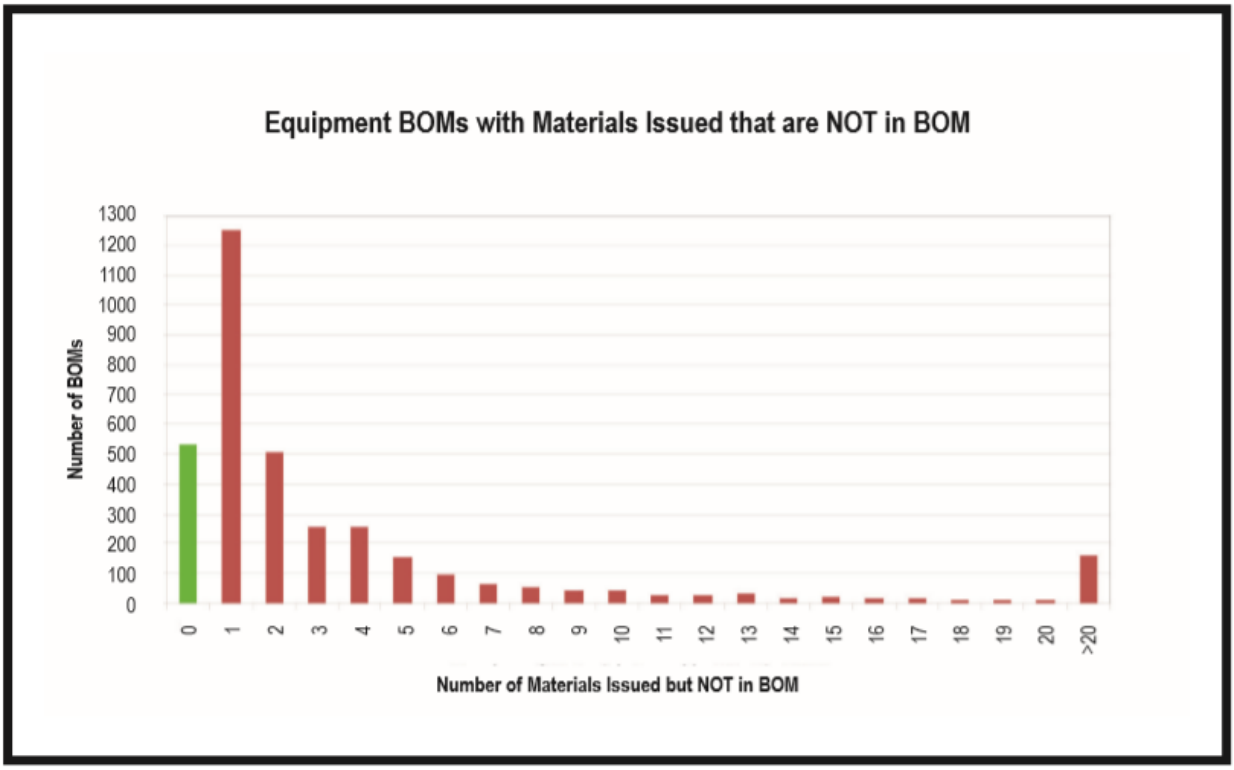
Although a lost opportunity for ball bearings may seem small, consider the number of items in a typical storeroom with several thousands of materials. In many cases storerooms will hold well over 100,000 parts. By achieving a small percentage of savings per item, the total savings can be very significant. The total savings is typically in the one to three percent range which typically equates to tens of millions of hard dollars saved.

The planned delivery date from the source of supplies have a range of 13 to 84 days, if this item belongs to an equipment critical category “D” (run-to-failure) and there are no parts available, the potential lost production can be costly when waiting for a part to be delivered or additional expense incurred by expediting shipment from the supplier. Behaviors and business processes broke down due to the consistency of the data, so much so that additional inventory was being ordered to compensate for lack of trust in the systems.

The business case is clear from this stock report – inventory, procurement, warehousing, and plant maintenance are all less than optimal due to the integrity of the data. To remedy this problem, the client would need to streamline processes for:

- Material master creation
- Establishing accurate equipment records and BOMs
- Implementing a sound master data governance program

EXAMPLE #5: THE IMPACT OF DATA ON MAINTENANCE WORK ORDER EXECUTION



The completeness and accuracy of the equipment BOMs were analyzed as the client was not meeting SlAs in support of maintenance execution. The cost associated with re-active work orders is generally accepted as six times more expensive than preventative maintenance.

The findings suggested that only 18% of more than 10,000 BOMs had the proper and complete material components required to execute maintenance jobs. Nearly 1,300 BOMs were missing at least one material, and close to 200 BOMs were missing more than 20 materials.

Asset workers would routinely be delayed and have to order new materials to "fill in the blanks." This issue was exacerbated as sighted in Example #4 as duplicate items were often re-ordered with wide variants on cost and levels of inventory were not depleted, but rather expanded.

While maintenance scheduling was in place, the net impact of the poor data was that the actual maintenance execution process was corrupted, delayed and costly.

NEXT STEPS

Following the EAM data analysis, the client had a significant baseline and foundation to determine their next relevant steps with a managed roadmap. Directionally, the client sought to address:

- Standardization of asset hierarchies across the corporation
- Physically match equipment masters updated with accurate BOMs
- Standard descriptions of material masters

- Duplicate material masters identified and corrected
- Standard structures for BOMs and equipment types
- Complete BOMs with all key components
- Inventory management strategies will be established for all material masters
- Enable further automation of the procurement process
- Streamline the ordering and on-time delivery of spare parts
- Apply consistent governance and control to create and maintain assets correctly
- Accurate reporting and decision capabilities

Recognizing the root cause and effect of data on plant operations, maintenance execution, and inventory and procurement optimization led the client to the conclusion that an effective data management strategy was critical to their long term success.

CONCLUSION & VALUE PROPOSITION

In this economy, business and IT owners are pressed to deliver more with less. Managing and maintaining your plants, assets and equipment can make or break your bottom line. Asset management is a top priority for those looking for optimized operations and real ROI and ROA. Orchestrating service maintenance, MRO materials procurement, optimizing inventory levels and sustaining plant knowledge with an aging workforce are all key elements for best-run plant operations.

Achieving an optimized landscape demands that people, processes and information are all in sync, and this includes your extended supply chain and business partners. The reality is that without the right data and information your best efforts and decision making are often compromised. Simply stated, your ability to meet business goals and metrics are often jeopardized due to the integrity of your data.

There are timely and efficient ways to remedy these challenges and ensure an optimized landscape is within reach. Getting your plant running on all cylinders, cutting costs and securing compliance are hard and fast outcomes from an EAM strategy. Utopia's approach aligns EAM with data management to address these business issues resulting in better plant operations, leveraging spend while reducing inventory, and improving asset maintenance execution.

ABOUT UTOPIA, INC.

Utopia, Inc. is a global data consulting and services firm employing Utopia's proprietary Enterprise Data lifecycle Management™ (EDLM™) methodology. Utopia serves customers in multiple industries with unique methodologies to deliver significant cost savings and improvements in enterprise data quality. Its data services offerings include strategic roadmap development, systems integration, data strategy and master data management (MDM), as well as data migration, quality and governance services.

Utopia, with global headquarters in Mundelein, IL, just north of Chicago, has offices in Canada, Europe, Middle East, India, Australia and Asia Pacific.

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