Verdantis
DATA DRIVEN PERFORMANCE

MATERIAL MASTER DATA MANAGEMENT FOR A LEADING OIL AND GAS COMPANY

Master Data Performance Solutions

"Quality Master Data for Improved Business Performance"

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Verdantis delivers Material Master Data Management for a world-Leading Oil and Gas company

The Oil and Gas sector is one of the most important industries worldwide, having highly significant forward linkages with the entire global economy and market. It is one of the fastest-growing industries, highly volatile, dynamic, and experiences changes at an unprecedented pace. Oil and Gas companies in the world need to respond very quickly to changing and emerging trends, anticipate and manage risk effectively and operate efficiently. The changing times and technology have also brought about a significant transformation in the business processes and operations of the industry.

The company is a worldwide leader in providing major mechanical components for land and offshore drilling rigs, complete land drilling and well servicing rigs, tubular inspection and internal tubular coatings, drill string equipment, extensive lifting and handling equipment, and a broad offering of downhole drilling motors, bits and tools. It also provides supply chain services through its network of distribution service centers located near major drilling and production activity worldwide. Leveraging over 800 worldwide manufacturing, sales and service centers, and revenue over $12 Billion, the company supplies customer-focused solutions that best meet the quality, productivity, and environmental requirements of the energy industry.

Corporate Objectives

The business and operations of the company are largely demand-driven, making it essential to respond in the shortest possible turnaround time and improve stakeholder satisfaction. Fundamental long-term challenges to replace and grow reserves, manage declining assets, and improve return on capital employed (ROCE) were not easily solved and in these volatile economic conditions, cost reduction and optimizing bottom lines formed the forefront of the company's business priorities.

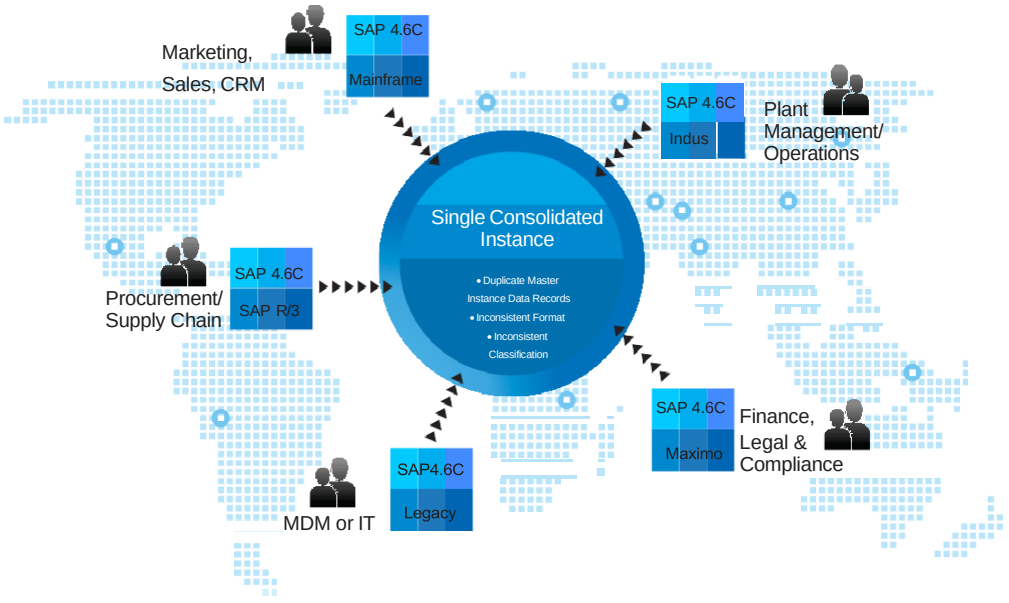
- Working Capital Management
- Lower Operating Costs
- Improved Employee Productivity
- Manage Industrial and Environmental Safety
- Enhanced Corporate Sustainability
- Operation Risk Mitigation
- Faster production and delivery efficiencies
- Manage political and economic pressures
- Deliver Energy and Asset Efficiency
- Business Process Improvisation

But like most organizations in the Oil and Gas spectrum, the company was already utilizing its full capacity resulting in huge backlogs. Their operations depend heavily on the enormous material base of the company which is spread across various locations over several years as it expanded in size and global reach in addition to the high adoption of newer technologies like the rest of the industry. This scenario has created a multitude of material and MRO management problems for the company.

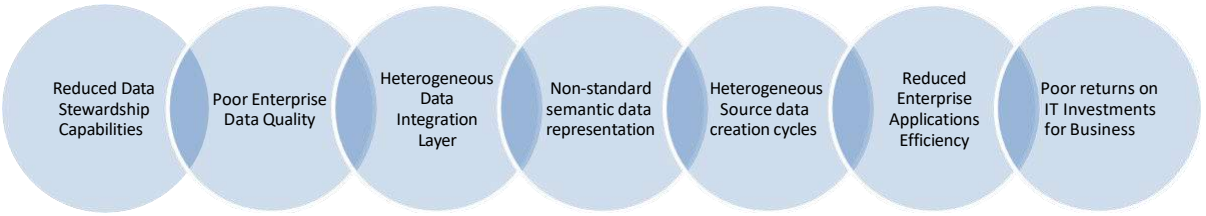
As the Director of Operations says, *"It was a major challenge for us to control the cost of inventory while reducing or eliminating manufacturing downtimes and supply chain disruptions, which can cost thousands of dollars in an asset-intensive industry like Oil and Gas. We have around 250,000 items in our material catalogues across all our locations. Availability of materials and MRO items at the right times at the right places at right costs is an essential requirement for successful uninterrupted functioning. However in many cases, our manufacturing and maintenance teams struggled to identify the items they need, face delays in part identification and finally end up making avoidable expensive and sometimes compromising purchases in a rush. The lack of ability to find previously designed products often created situations where redundant engineering can take place."*

IT as the expected savior

With the advent of IT and the gradual penetration of software systems into the manufacturing and maintenance setup of the Oil and Gas industry, the company had various source systems like ERP, asset management systems, maintenance management systems, and other legacy systems and applications installed over several decades. While these systems have addressed the material, asset,
and MRO management challenges to a large extent, they have failed to plug the leaks allowing them to pervade and negatively impact all operations in the future. The low returns on the IT investments and continuing management problems were primarily due to the flaws in the underlying information stream that supports these systems and the associated business processes – Master Data.



Each IT system supported business units and teams with their terminologies, standards, codes, sets, processes and demands for the same material master data elements. With no inherent user standards for the material data creation and maintenance, the bulk of the material data in these systems was inaccurate, incomplete,, or outdated. This lack of consistency and accuracy in the material data negated the advantages of a large asset base and reduced the ability of the organization to tap its resources efficiently. This breeds the perfect scenario for significant data quality and management issues.



A BU SAP Center of Excellence Lead says, *"The quality of the material data was largely degraded. Non-uniform commodity standards, poorly classified material data with missing part numbers, poorly structured descriptions with inconsistent and missing specifications, and missing characters of the parts. The material master was also replete with duplicates that led to unscheduled downtimes and disruptions. The business process systems did not have a common view of the same material data and lacked a 'single version of the truth'. This adversely affected the integration, consistency and search capabilities of our PLM/PDM, ERP and other critical systems and had a huge bearing on the operating profits. Our manufacturing and engineering operations depend largely on our material information. It is highly essential for us to have a clean material master to maintain efficiencies concerning the forward linkages with major upstream operations and in delivering our products to our customers."*

The IT, Functional, and Business Unit stakeholders analyzed the adverse impact of the existence of "black-hole" non-standard information creation which could not be utilized to create business intelligence and how it was adversely affecting business decision making right from top to the bottom.

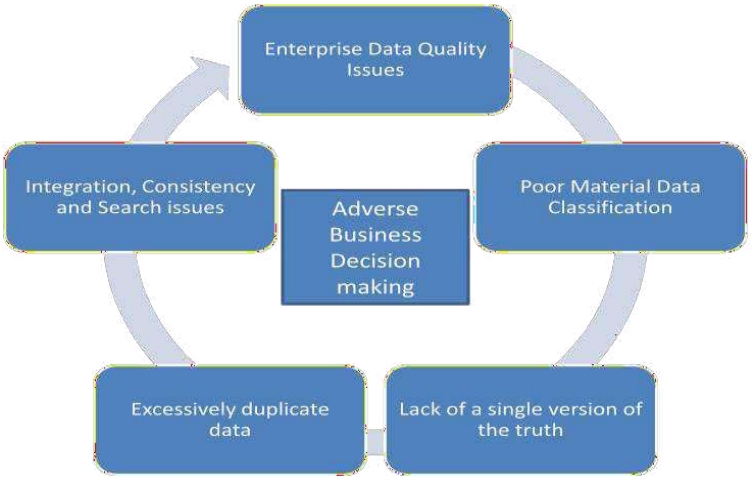
Master Data Challenges

The company faced significant challenges with their master data.

- Lack of consistency and standards for the master data
- Incorrect, incomplete, unclassified and outdated attribute fields of master data High volumes of data in multiple languages
- Multiple ERP and other legacy instances across the company
- Poorly structured material descriptions
- Lack of data governance and collaboration across cross-functional divisions and locations

For example, if the material data is unclassified, searching for a simple bolt can return hundreds of results causing employees to spend more time identifying the materials that they need. If a facility manager

cannot find the materials or spare parts in the inventory system, he/she immediately raises a purchase request, hard-pressed for time and aiming to avoid costly operations disruption, while all along the materials needed exist physically in the inventory, but were associated with bad master records in the system. The new purchase leads to the creation of a new master record and with no data governance and stewardship in place, there is a high possibility for the new material data record to be as corrupt and the quality of the material master gets more and more degraded over time. The data quality issues also present many challenges for IT in the form of largely diminished returns from investment on enterprise IT infrastructure, lack of data synchronization and dependency on the data for business users and high burden on the IT support systems.



A facility manager adds: *"The bad material data quality leads to equipment and manufacturing process downtimes, which is our number one enemy. We have many forward linkages with organizations dealing in upstream operations and our customers depend on the timely delivery of our oilfield products for them. The facility downtimes thus lead to heavy losses in the form of lost revenue generation opportunities both for us and subsequently for our customers. Since the industry is highly demand driven and has a significant effect on the economy, it is important for the company to be responsive to challenges. It also elevates the need for minimizing the errors and ensuring internal and regulatory compliance failing which, there is a high potential for risk, failures, and environmental and safety hazards. The recent Gulf of Mexico oil spill has put the operations and performance of Oil and Gas companies under the microscope. For example, equipment like an oil pipeline, manufactured with faulty materials, can lead to potential hazards like oil spills leaving ample scope for the company to incur heavy losses in the form of penalties, non-compliance fines, etc."*

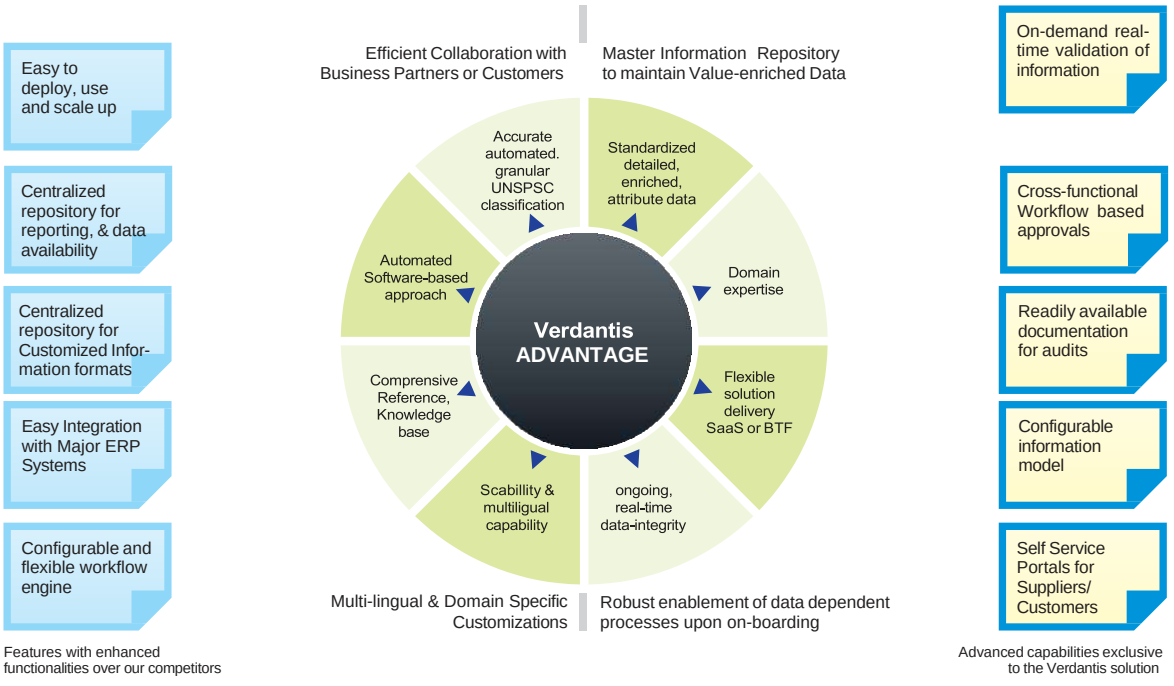
The Solution – Master Data Management

The company, having realized that corrupt material master data is one of the primary causes for many of their challenges, decided to implement a Master Data Management initiative to address them. The scenario analysis had revealed the dire situation of their material master data and the negative impact it had been creating on their operations and business processes, and the need for a comprehensive strategy to standardize, de-duplicate, enrich and deliver accurate material master data. A steering committee

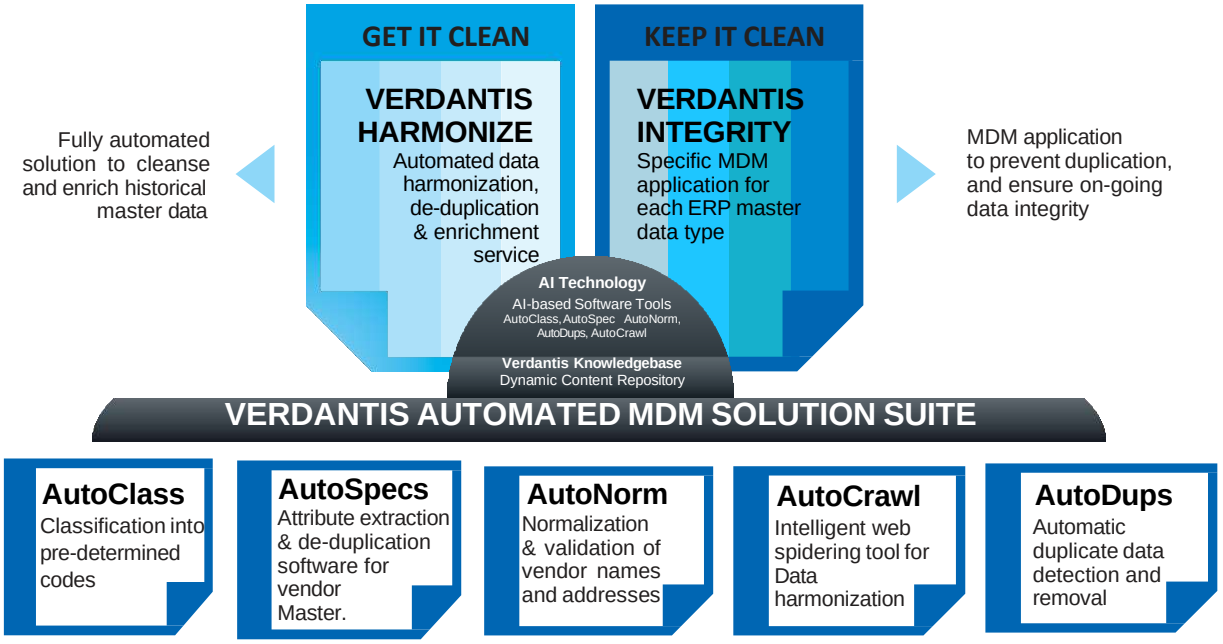
comprising top-level management and key stakeholders from all cross-functional divisions was set up. The primary targets from the material master data management initiative were:

- Accurate master data for customer-facing catalogue
- Accurate MRO data for maintenance
- Classify according to UNSPSC with HTS requirements
- On-going process for new material data
- Data governance and stewardship to maintain data quality
- Accurate inventory usage and customer consumption
- Enriched fields for customer ease of selection

After finalizing the targets, the next step for the steering committee was to find a Master Data Management solution that would meet all their requirements the best. "*We conducted a review of the existing MDM solutions in the market. After due diligence, we narrowed down the list of potential solution providers and after seeing solution demonstrations of the competing providers, we finally chose Verdantis Material MDM because it was the only solution that catered to all our requirements, with significant additional benefits of its own*", says the Director, IT Planning and Development.



Verdantis undertook a detailed and comprehensive proof-of-concept study in which it demonstrated the features and capabilities of the Material MDM solution by harmonizing a subset of the company's material master data with Material Harmonize and implementing an ongoing data maintenance strategy with Material Integrity. The proof-of-concept process was highly successful in which the solution excelled at attribute extraction and classification accuracy.



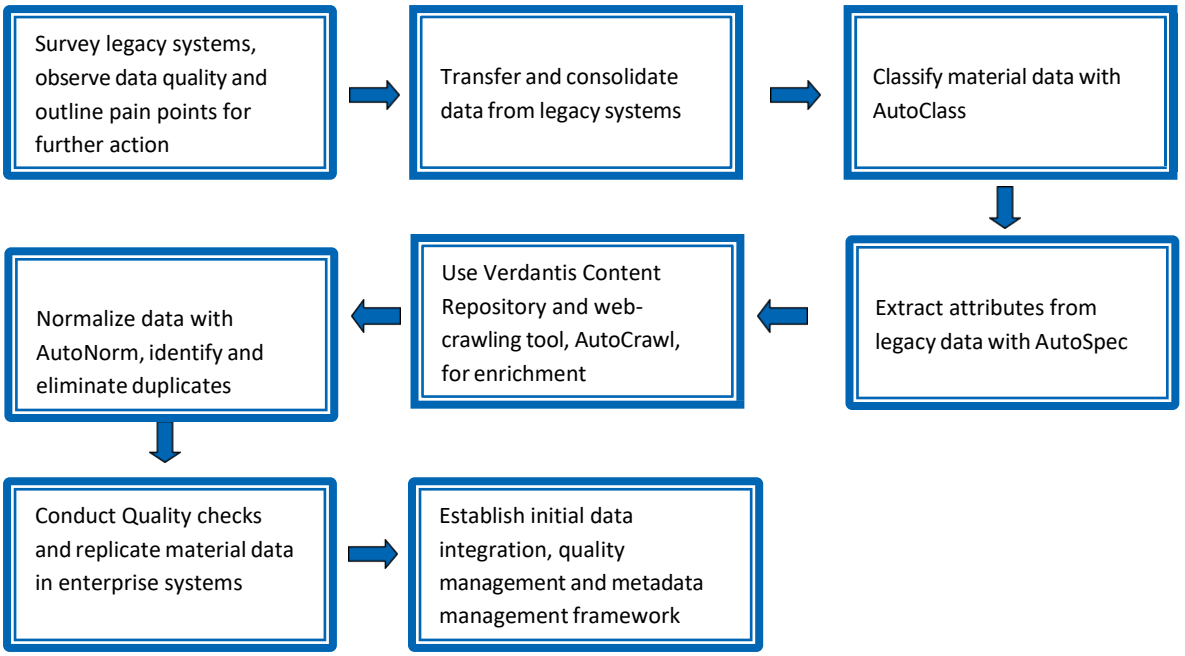
Artificial Intelligence forms the bedrock of Verdantis's automated MDM solution suit

Material Master Data Harmonization

Verdantis Material Harmonize is an automated solution for cleansing and enriching historical material master data. It combines software driven automation, domain expertise and proven methodology to consolidate and harmonize the legacy material data. The solution leveraged automated AI-based software engines – AutoClass, AutoNorm, AutoSpec, AutoCrawl, AutoDups – and the Verdantis Content repository which acts as a knowledge base with Dynamic and Static content for material data enrichment. It analyzed cryptic text fields of the material master records, classified and then enriched the company's material records in accordance with the classification standards.

The materials were classified according to the United Nations Standard Products and Services Code (UNSPSC), which is a hierarchical convention that is used to classify all products and services. In addition, with the company having facilities in different geographies the materials were also classified in accordance with the Harmonized Tariff Schedule (HTS), which was aimed at segregating and identifying commodities from the customs point of view – classification for all goods exported and imported from the US. The company had materials totaling **150,000** which were classified into **1210 UNSPSC codes and over 500 HTS codes.**

It then parsed unstructured material attribute information from text fields into specific fields selected and/or added by the company and depending on level of granularity desired. The solution then searched for exact matches by supplier names and/or part numbers to identify and eliminate the duplicates in the company's material master data. The solution generated normalized short and long material descriptions from the standardized and enriched material attribute fields. In the last step of the harmonization process, the enhanced material master data was replicated in the enterprise software systems and migrated to the system of records.

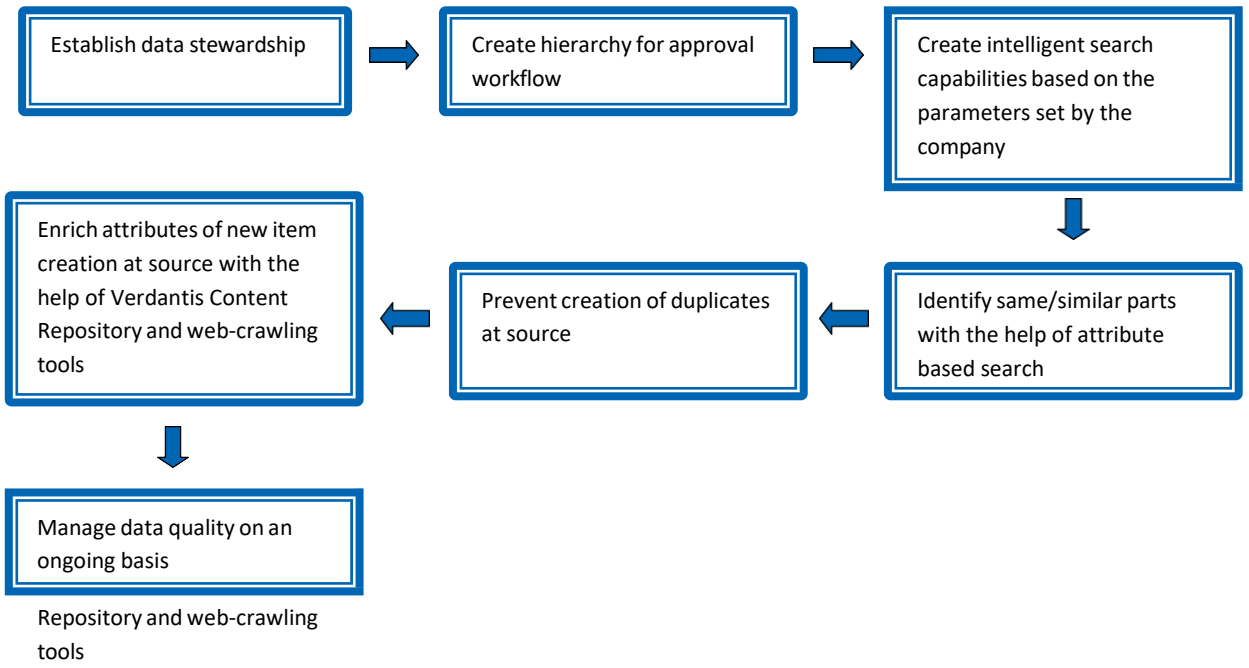


On-going Material Data Maintenance

The next stage of the material master data management was the on-going maintenance of material data creation, modification, and utilization across the organization in order to keep the material information permanently clean in the enterprise systems. As the Director, IT Planning and Development adds: “Once the cleansed material data was loaded into the systems, another battle started – maintaining the quality of the data. It was important for us to have an on-going data maintenance strategy on board to leverage the gains from the harmonization process.”

Where MaterialHarmonize ends, the Verdantis MaterialIntegrity Solution picks up to manage material master creation and maintenance going forward. It provides a one stop solution for master data managers who are responsible for maintaining the quality of materials data in the ERP system, and who need to prevent data duplication and enable enhanced discovery, visibility, and compliance. Material Integrity leverages AI-based software tools in a real-time mode for intelligent auto-creation of items and ongoing data quality maintenance-at source.

The MDM implementation team of the company and the Verdantis team collaborated to determine and establish approval workflows for data maintenance. A stringent data governance strategy was developed with appropriate data stewardship and data maintenance roles assigned to various stakeholders in the business and operations hierarchy. The solution automatically analyzes all the cryptic fields of the material data whenever a new data entry is created or modified. With comprehensive dynamic content repositories that are up-to-date, the solution automatically classifies, normalizes, de-duplicates and enriches the data by filling up the missing information from the attributes. In addition to real-time data maintenance, the solution consolidated all the material information in a single central repository for better availability and usage by users across all the cross-functional divisions and systems which enabled informed and improved decision making.



Repository and web-crawling tools

Key Benefits from the Program

The Material Master Data Management initiative proved to be a major success. The company was able to overcome most of the material management challenges as a result of the MDM project, reap many significant benefits and help reach their corporate objectives.

Financial Benefits	Better spend analysis, higher bottom-line savings Optimized inventory, enhanced discovery of obsolescence in material base, inventory cost reduction and cost avoidance Optimized ROI from large scale IT and other investments
Manufacturing and Operations Benefits	Integrated material data across locations, systems and divisions and enterprise visibility Enhanced material and part search capabilities improved manufacturing, procurement and streamlined operations Decreased manufacturing equipment and plant downtimes
IT and Data Benefits	Cleansed, de-duplicated, classified and enriched Material Master Data Defined Schema, data Models, and taxonomy for material data Facilitating cross-functional data synergies across applications systems Drastic reduction in data creation and manipulation cycles, and compliance with IT's norms for data quality
Sustainability Benefits	Better access to information and greater corporate transparency Keeping pace with business partner expectations and competitor activities Improved industrial and environmental safety measures and compliance to regulations Introduction of stringent regulations for non-financial reporting

About Verdantis

Verdantis is the first to offer Master Data Management solutions that bring real ROI and Business Value by focusing on the business use and application of organizational Master data. Verdantis uniquely offers end-to-end automated ERP MDM solutions driven by our suite of Artificial Intelligence (AI) based solutions and business roles and rules. Our easy-to-use solutions are easily configured to fit enterprise requirements for classification, enrichment, screens, fields, security, attachments, workflow approvals, languages and more.

Verdantis Harmonize® is a high-speed automated material /item data quality improvement tool that uses internal knowledge assets to master legacy data. Harmonize assures a globally unified, standardized, de-duplicated and enriched material master for uploading into a customer's ERP, EAM as well as Verdantis Integrity.

Verdantis Integrity® is a data governance tool that manages the quality of the material/item/product master data on an ongoing basis. Powered by a strong workflow engine and a guided item creation process, it keeps a cleansed and harmonized material master permanently pristine. It prevents data duplication and enhances organization-wide parts discovery, visibility and compliance.

Leading global companies have chosen Verdantis solutions for the following reasons:

- In-depth industry and data-specific domain expertise with a robust project methodology
- End-to-end automated processes to harmonize & enrich historical master data
- Ability to ensure semantic and structural data integrity and quality
- Ability to handle large volumes of cryptic and complex data in multiple languages
- Delivery of higher quality and volume than manual/database-centric approaches
- Flexible engagement models with a single focus on customer success

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