MRO Data Optimization

Using a Schema and Automated Conversion Software to Manage Maintenance, Repair, and Operations (MRO) Data

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White Paper

Facing the MRO Data Challenge

Modern industrial, process, and manufacturing organizations often require hundreds of thousands of parts for maintenance, repair, and operations (MRO). These indirect materials make up a company's non-production parts and supplies, such as:

- Bearings
- Pipe/Fittings
- Lubricants
- Motors
- Seals
- Valves

The company's MRO databases often contain tens of thousands of unidentifiable, duplicate, or non-comparable MRO items. Inaccurate MRO data makes Enterprise Resource Planning (ERP), Enterprise Asset Management (EAM), and Master Data Management (MDM) systems ineffective:

- Users cannot successfully identify a part or replacement.
- The MRO database contains duplicate items.
- Purchasers buy parts outside their company's procurement system.
- Inventory values rise.
- Inventory turn rates decrease.
- Expedited part orders increase.
- Equipment downtime increases.

Companies need an effective way to optimize and manage their industrial MRO materials information. They require a single, consolidated catalog with complete and consistent descriptions, free of duplication and ambiguity.

Cleansing MRO Data With Auto-Classification Software

To solve their MRO data problems, companies must cleanse the data to insure that it is accurate, up-to-date, and non-duplicative. Auto-classification software can be a highly efficient solution for cleansing MRO data. But effective auto-classification software must include:

1. A standard framework (schema) that defines catalog item descriptions and attributes.
2. Rules to identify and extract words and values from legacy (source) descriptions.
3. Rules to fit the extracted words and values into the target schema.

To meet these goals, IHS Intermat Solutions provides:

- Standard Modifier Dictionary (SMD)™, the world's most widely-used cataloging methodology for MRO data.
- AutoCon™, an automated conversion system for developing and maintaining a structured MRO catalog.

Standard Modifier Dictionary (SMD)

The Standard Modifier Dictionary (SMD) from IHS Intermat Solutions is the most widely used cataloging tool in the world.

- The SMD is used daily by more than 2,000 industrial facilities in 33 countries.
- The SMD is used to manage vast inventories of MRO materials such as pipes, valves, bearings, associated plant equipment, and general supply items.

Mastering the MRO Catalog

Much of MRO parts information consists of unstructured free-form text entered in a variety of ways. This lack of standardization results in product descriptions that are incomplete, inconsistent, and non-comparable.

IHS Intermat Solutions solves this data problem with the SMD:

- The SMD gives companies the benefits of structured, accurate, and accessible product information.
- The SMD was developed by industry and commodity domain experts to support MRO professionals who procure, manage, supply, and use MRO items.
- IHS materials analysts have used the SMD to standardize and enrich more than 50 million MRO item descriptions for over 330 companies in the Global 2000.

Tangible and Sustainable Benefits

The SMD enables companies to realize significant savings:

- The SMD helps identify duplicate inventory.
- The SMD helps avoid false stock-outs.
- The SMD simplifies inventory searches.
- The SMD helps reduce equipment downtime.
- The SMD enables companies to realize maximum benefits from their ERP, EAM, and MDM systems.

Consistent and Repeatable Rules

The SMD is a two-tiered parametric classification schema that provides a consistent and repeatable set of rules to characterize and catalog inventory. The SMD includes an optional third-tier upper classification level.

The SMD consists of a family of mutually exclusive:

- **Nouns (Class)**
  A proper name such as *valve.*
- **Modifiers (Sub-Class)**
  A descriptive word or phrase such as *gate.*
- **Characteristics**
  General part attributes such as *size, pressure rating,* and *connection.*
- **Sample Values**
  Specific sample values such as *6-inch.*

Key Features

The following key features differentiate the SMD from other, less-powerful cataloging tools:

- **Classification Definitions and Guidelines**
  The SMD technical and catalog management-based definitions and guidelines support the correct selection and application of each SMD format.
- **Synonyms**
  The SMD cross-references synonyms and alternate nouns to approved noun names. Cross-referencing prevents duplication and ensures successful searches.
- **Characteristic Definitions and Sample Characteristic Values**
  The SMD uses context-specific definitions, together with sample values/ ranges, to illustrate permitted values.
- **Item (Product) Images**
  The SMD contains images for the top 80 percent of nouns.
- **Search Capabilities**
  The SMD permits parametric searching to facilitate quick and accurate data queries.
- **SMD Specifications**
  The SMD consists of over:
  - 2,400 noun (class) and modifier (sub-class) pairs
  - 15,000 definitions and guidelines
  - 2,000 synonyms
  - 29,000 sample values
  - 9,000 characteristics
  - 1,000 reference images
- **Multi-Lingual Capabilities**
  The SMD is available in English, Chinese, Dutch, French, German, Italian, Japanese, Portuguese, Russian, Spanish, and Swedish.
- **Compatibility with ERP, EAM, and MDM**
  The SMD is compatible with leading ERP, EAM and MDM systems, such as:
  - SAP
  - IBM Maximo
  - Indus PassPort (Ventyx)
  - PeopleSoft/ JDE/ Oracle and many more
- **Compatibility with Upper-Level Classification Schemas**
  The SMD is compatible with upper-level classification schemas, such as UN/SPSC, eCl@ss, and other emerging data exchange standards.

The AutoCon Automated Conversion System

AutoCon is a proprietary automated system from IHS for building a structured MRO database. AutoCon is used to scan, parse, auto-classify, and standardize MRO databases.

Over the last quarter of a century, AutoCon has been used to process more than 50 million MRO items for hundreds of Fortune 1000 companies worldwide. This continuous refinement and improvement has made AutoCon the world's most powerful automated classification software.

- AutoCon is specifically tailored for industrial MRO part and material descriptions.
- AutoCon uses over 350,000 rules to extract and classify data to the SMD.

- AutoCon classifies to over 2,400 SMD formats for virtually all industrial MRO items such as parts, materials, associated plant equipment, and general supply items.
- AutoCon automatically classifies items and extracts attributes from unstructured, free-form text.

Classification

During classification, AutoCon identifies the item and assigns it to a class or category. To successfully classify MRO items:

- AutoCon applies specialized rules to recognize patterns in MRO item descriptions.
- AutoCon recognizes synonyms and aliases.
- AutoCon interprets common abbreviations.
- AutoCon applies MRO-specific rules to recognize and classify ambiguous terms.
- AutoCon understands word combinations in context, rather than just individual words standing alone.

Attribute Extraction

Once AutoCon has classified the item, AutoCon searches for the item's characteristics and attributes. AutoCon recognizes, and is able to standardize and normalize, thousands of variations of characteristics and attributes. The AutoCon rules are based on the numerous variations that IHS Intermat Solutions has handled while processing tens of millions of MRO items. Virtually every possible attribute variation is recognized, slotted, standardized, and normalized.

Code Assignment

AutoCon recognizes and extracts upper-level classifications used for procurement and spend analysis, such as UNSPSC and eCl@ss.

Termination Tables

Termination Tables allow the user to ignore any description that follows the terminator during noun (or class) identification. A similar table is used for words that are followed by a part number. These words are not used during noun identification.

Conclusion

Automated classification software needs to do much more than basic data parsing and artificial intelligence mapping of categories and attributes. Effective automated classification software requires a strong data dictionary or schema tailored for industrial MRO item descriptions. This schema must support the needs not only of procurement departments, but of maintenance and operations personnel as well. The schema must recognize the numerous anomalies and inconsistencies that are typically present in legacy data. Only AutoCon (along with the SMD) from IHS Intermat Solutions meets these standards. IHS has 29 years of data conversion experience, processing over 50 million MRO parts and materials descriptions from 330 companies and 2,000 plants worldwide.

About IHS Inc.

IHS (NYSE: IHS) is a leading provider of critical technical information, decision-support tools and related services to customers around the world. Our data and services are used primarily by the energy, defense, aerospace, construction, electronics, and automotive industries. IHS translates the value of our global information, expertise and knowledge to enable customer success and create customer delight on a daily basis. Ranging from governments and large multinational corporations to smaller companies and technical professionals in more than 100 countries, customers rely on our offerings to facilitate decision making, support key processes and improve productivity. IHS has been in business for nearly 50 years and employs more than 2,900 people in 35 locations around the world.

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