

Cross Industry View of Parts Management

PSMC Conference

April 30, 2014



Convergence Data Today – Software and Services - Common Parts Mgt



Our Mission is to help our customers extract more value out of their enterprise systems with improved item data

■ **Our Focus:**

- Convergence Data is a leading provider of CSM - Component and Supplier Management Solutions to Discrete Manufacturing Industries
- 13+ years experience producing documented value from advanced Software and Consulting Services to industries including Aerospace & Defense, Electronics, Oilfield Services and Consumer / White Goods

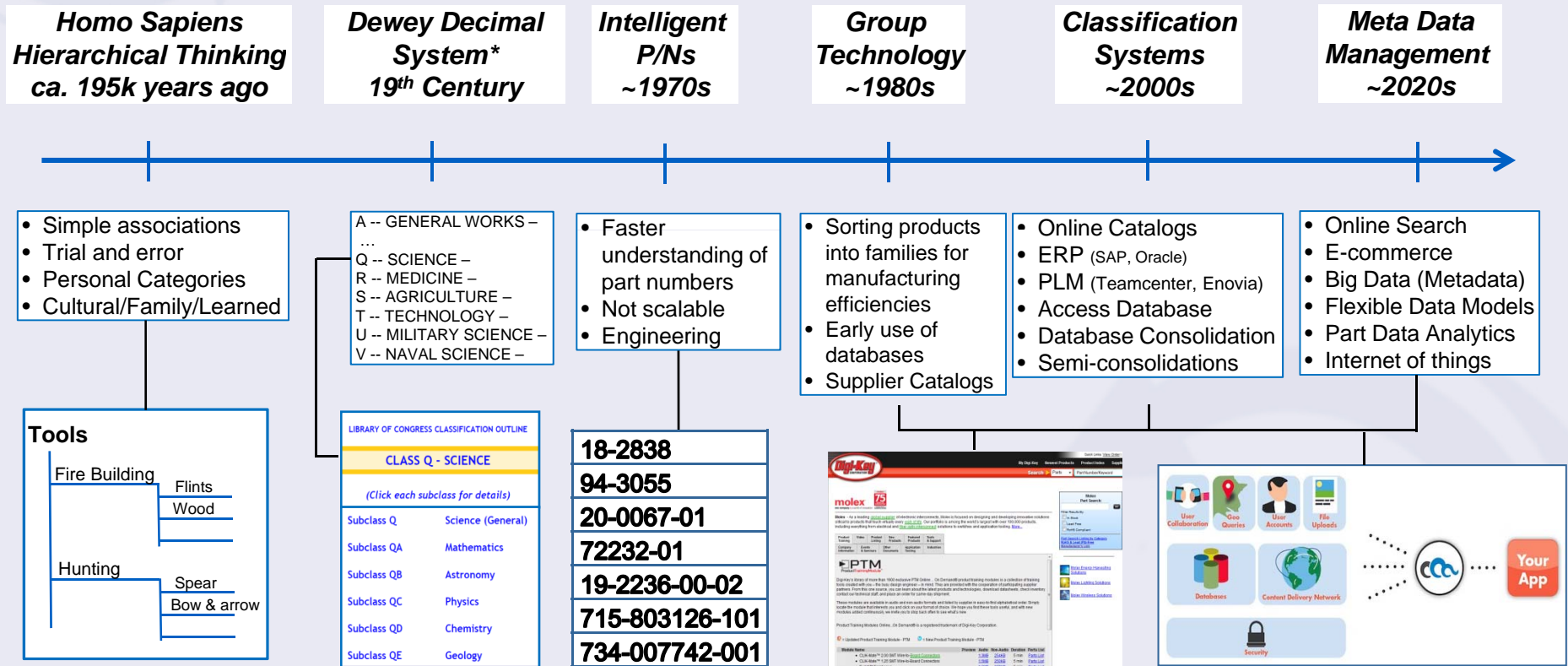
■ **Our Value: Promote Std Part Re-use and Managing Part Proliferation and Compliance Issues**

- How - Improving Data Quality and Implementing Data Standards

■ **Our Products:**

- Design for Retrieval (DFR): Item/parts catalog application
- SmartFind: Advanced Search tool for DFR catalog

Overview of the History of Part Data Classification & Search



Part Classification - Foundation To Common Parts Mgt

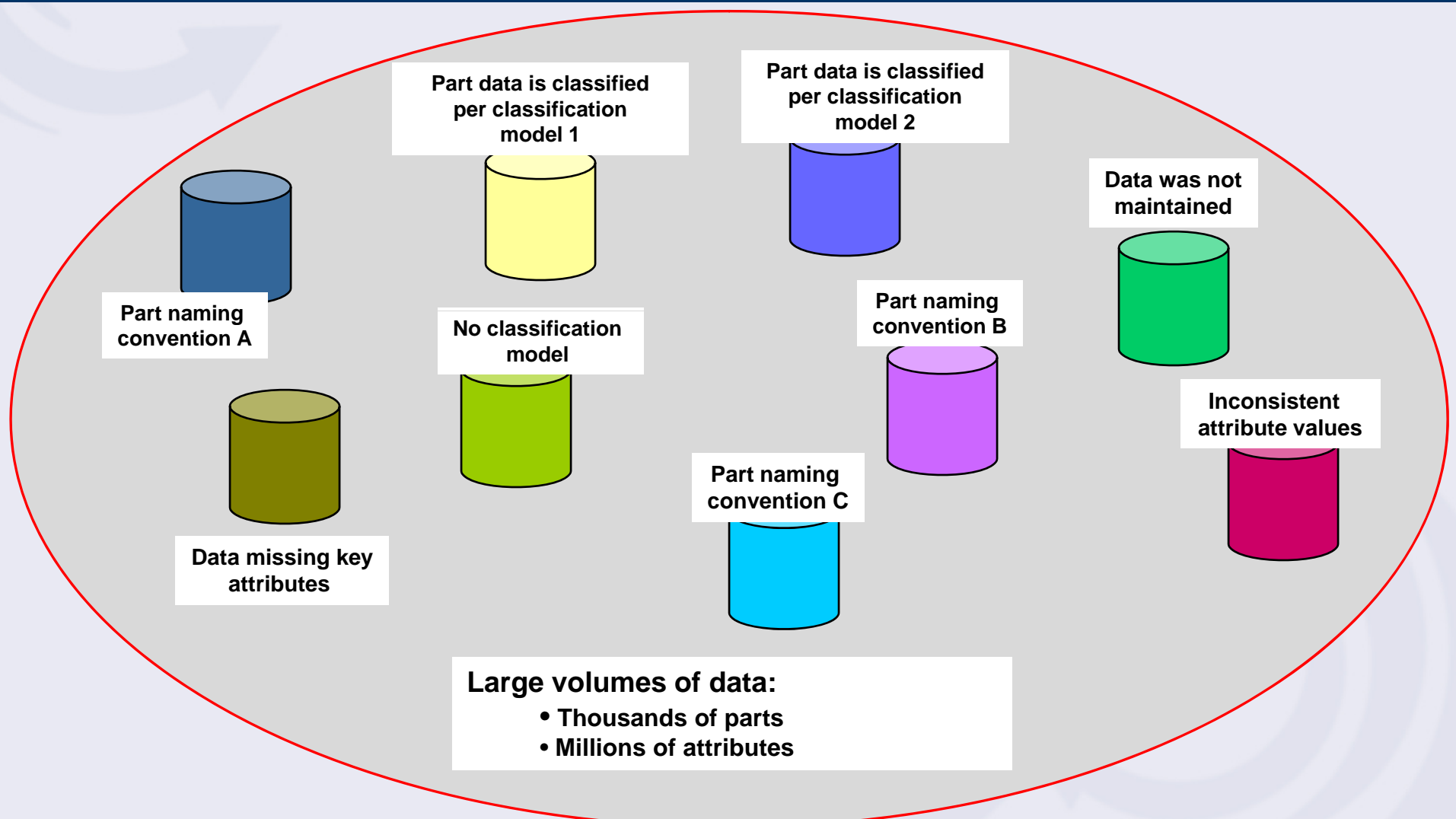
Professionals in Product, Part and Supplier Management functions require good information to answer important questions that affect the bottom line.

---Representative Business Questions---

Technology/ Engineering	Sourcing/Supplier Management	Quality/ Compliance	IT
<ul style="list-style-type: none"> • Do I have a part I can re-use? • Are all the parts / suppliers approved? • Am I below my cost target? • Are there any supply chain issues , e.g. End of Life, with any of the components I am specifying? • Are we keeping in compliance with the latest environmental regulations, e.g. Design for Environment (DfE)? 	<ul style="list-style-type: none"> • Do I have alternative suppliers for this part? • Are there any lower cost alternatives? • Do I have all the correct facts for this negotiation? • Has technology used all the best parts & suppliers? • Are our suppliers prices in line with what others are paying? 	<ul style="list-style-type: none"> • Do we have any risk of counterfeits? • Are any parts or suppliers consistently poor performers? • Have manufacturing processes changed significantly? • Are all of our test plans on track? • Do we have any RoHS / REACH exposures? 	<ul style="list-style-type: none"> • Providing a scalable solution supporting millions of items and hundreds of users located in different countries • Agnostic architecture that works with existing applications supporting SOA or point to point integrations

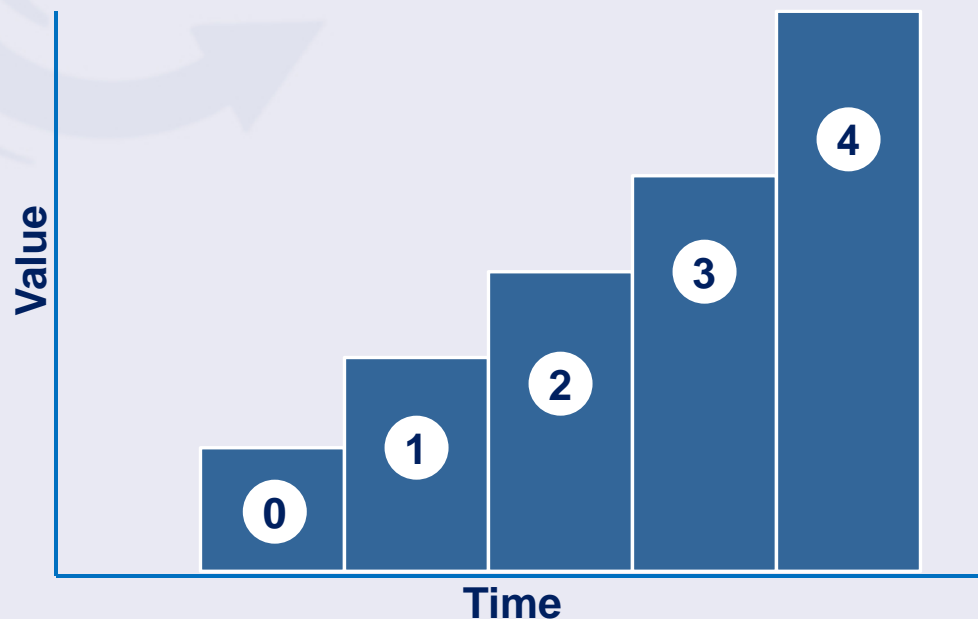
The Data Required to Drive Effective Decision Making exists both Inside & Outside of the Company

Typical part data situations across a company – limiting common parts mgt



This drives higher costs, longer lead times and causes frustration

Profile - Part Data Classification Maturity Levels



NOTE: Bar chart scale is not intended to represent actual generated value

Maturity Level	Tools / Solutions	Parts Governance	% Parts Managed	Typical Sources of Benefits
0	Spreadsheets	None	5-15%	Benefits localized to small groups
1	Centralized database via homegrown tool or PLM	Minimal	10-30%	Benefits limited to one organization
2	Dedicated 3 rd party solution deployed	1 st year with a Data Factory in place	~30%	Early sourcing analyses; start of part de-duplication; cross-functional collaboration
3	Level 2 + external content feed	Formal roles in place for the long run	~ 60%	Begin reusing parts; early compliance; direct materials cost reductions
4	Level 3 + integrations to PLM & ERP	Reporting metrics on C-level scorecards	90%+	Preferred parts; use of parts management in NPI process; achieve compliance goals

Different industries have their own way of achieving common parts management

1 Oilfield Services

- ✓ Growth through acquisition
- ✓ Globally dispersed industry
- ✓ Local management of inventory
- ✓ Medium complexity products w-custom configurations



2 Aerospace & Defense

- ✓ Highly complex products with significant electronics content
- ✓ Focus on managing obsolescence issues
- ✓ Products with long life cycles



3 Appliance

- ✓ Highly competitive industries
- ✓ Retail and price competition
- ✓ Multiple configurations
- ✓ Proliferation of variants

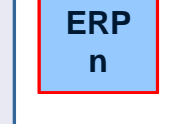
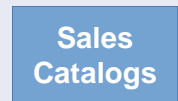
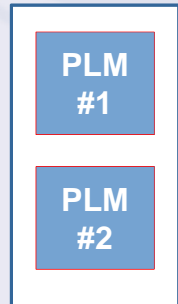


Case Example 1 – Oilfield Services: Growth via Acquisitions

- A \$2 Billion company in 2001 acquired over 50 companies in 6 years and inherited more than 20 legacy business systems (> 1 million parts with huge potential for duplicate parts and obsolete inventory)
- Implemented a data conversion process and tools to help migrate legacy data to a new ERP and PLM system. Consolidated, classified and cleansed over 500k parts.
- **Over 1M duplicates were consolidated during the data conversion effort.** In many cases the same businesses were buying the same part and applying different part numbers
- Enabled the sourcing of purchase parts and raw materials at a global level versus at a plant by plant level
- Benefits achieved: today when a new business is acquired that may have 100k of parts, 50% can be consolidated as duplicates prior to migrating to the central ERP system

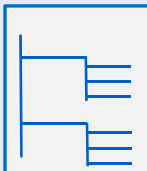
Case Example 1 – Oilfield Services: ERP Data Conversion Process

“New” Legacy Systems
From M&A activity



Migrate
Legacy
Data

Part Data
Model



Data Factory



Data Governance

DFR
Part Data
Classification

- “Heavy-lifting” Data Conversion
- Elimination / consolidation of duplicate parts
- Data standardization
- “Heavy-lifting Data Cleansing
- Validation with ERP & PLM

E
X
P
O

API

Each business application has
varying search capabilities

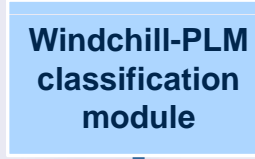


Business /
Commercial
Data

Technical
Data



- Standard descriptions
- Commodity Codes



- NPI
- Parametric search
- BoM
- ECM

Key Points:

- Why? – address data issues before implementing ERP
- Why CDS? – needed dedicated “offline” classification tool
- Challenges – starting data conversion effort ahead of ERP timeline
- Possible similarities with MOLX – lack of data standards
- Specific points about how governance was important to them
 - Collaboration across businesses – data model, changes, NF
 - Transitioning to central control vs. local decision making
- Other points:
 - All new items require classification and approval
 - Ongoing work today btw 2 teams Houston, TX & Aberdeen (

Parts Management – mitigating duplicates, consolidating material standards, and normalizing data

Case Example 2 – A&D Contractors – Electronics with 3rd party content

A & D Customer #1

--drive standard part reuse--

- Replaced hard to maintain legacy i2/Aspect electronics parts catalog technology with DFR Oracle
- Implemented our API to support the NPI process supporting multiple PDM systems
- Consolidated and simplified data model prior to the data migration
- Provided an easier to use search interface that was configurable based on data model properties
- Implemented 3rd party content integration utilizing Information Handling Systems (IHS) electronic parts catalogs (4D online)

A & D Customer #2

--replace an aging tool--

- Replaced legacy i2/Aspect electronics parts parts catalog technology
- Developed an easier way to make changes to their classification structure -- i2 systems deemed too difficult to maintain
- Migrated over 3 million items plus 2 million relationships
- 3rd party content integration utilizing IHS electronic parts catalogs
- Implemented relationship search capabilities support Examples: part to program – to meet part preferencing requirements

Parts Management Promoting - reliability, standardization, quality and obsolescence mitigation

Case Example 2 – A&D Contractors – Benefits

- **Standard Parts List (SPL) – based on ten year history**
 - 7458 NHAs/per year used SPL parts. Multiple SPL applications on each (NHA – Next Higher Assembly)
 - Assume that 50% of the NHAs would have generated at least one functional duplicate were it not for the SPL.
 - 3729 new part introductions avoided annually due to SPL
- **\$35M/year Cost avoidance over all part types**
- **New Part Request workflow**
 - Electronic New Part Request (NPR) workflow
 - Metrics generated directly by the workflow.
 - Rejected 613 NPRs and corrected part numbers on an annual basis
- **\$6.4M/Year cost avoidance due to NPR process in 2014**

Key Points:

- Why? – current system hard to maintain, data model required significant changes
- Why CDS? – more flexible technology
- Challenges – IT controlling changes based problems with past legacy system
- Possible similarities with MOLX – high concentration of electronic components
- Specific points about governance
 - Governance was not extended to engineering
- Other points:
 - Benefits – tracked the number of preferred parts re-used vs. new part requests

Parts Management - reduces new part introductions

Case Example 3 – Appliance Industry – Cost Reductions

Appliance MFG

(escalating costs – 2008 recession)

- Initially focus on component data and analysis tools to support CAM direct material sourcing – Joint Engineering/Procurement Initiative
- Developing an enterprise classification structure for all items including parts, subsystems, documents, and modular items

Materials

- Component rationalization
- New item creation and reuse
- Data development
- Collaborative Classification
- Managing classification, attributes and data
- Search & find
- Workflow
- Component cost reduction

Small Sample of Material Savings

Material	Consolidation Lever	Complexity 2009	Complexity 2011	Savings Opportunity (hard savings only)
Valves	Flow Rates, Brackets	141	36	12-18 %
Steel Coils	Gages, Grades, specs	1008	402	3-5 %
Resins	Colors, Filler, Specs	384	233	4-8 %
Tier II Electronics	Mounting, Ratings	2901	754	10-12 %
Wire Harness Components	Wire Gage, Terminals Housings	2743	1783	9-12 %
Brand Badges				

Key Points:

- Business issues Customer was trying to resolve
 - Material Cost reductions key to surviving the 2008 recession
- Data was critical to achieving cost benefits
- Challenges – knowing how much data produced by commodity group
- Specific points about how governance was important to them
 - Customer set up Material Value Teams that now manage categories of buy items

part requests are now classified proper category with attribute data

direct material cost savings in the range – reduced PO's across commodity groups

Parts Management – standardization, cost reduction, parts reuse and NPI part classification

2008 - 2009

With superior data readily available, professionals within the functional organizations will make better decisions which will help the bottom line.

---Representative Business Benefits---

Technology/ Engineering	Sourcing/Supplier Management	Quality/ Compliance	IT
<ul style="list-style-type: none">• Quickly locate different components for design purposes• Choose active parts with longer expected lives• Choose compliant parts (RoHS, REACH, conflict minerals, etc.)• Correctly estimate target costing based on up-to-date component costs• Enable “Design to cost” by finding lowest cost components that achieve performance objectives	<ul style="list-style-type: none">• Promote direct material cost reduction• Reduce the time spent gathering and analyzing data for proposed BOM components• Easily identify qualified crosses for BOM components	<ul style="list-style-type: none">• Easily maintain qualification status and data with components• Provide Approved Vendor List information & detailed component data• Monitor compliance status of manufacturer components• Warn of counterfeit, quality, availability issues	<ul style="list-style-type: none">• Client server architecture makes upgrading process easy for IT and the end users• Support provided at different levels including: user training, application issues, integration and environmental issues.

Sample Analytics: Complete & Consistent Part Data - Better Decisions

Small Neighbor Distance will find close duplicates

Neighbor Distance: 2.00

Save cluster as Batch

Save

Export

Recent Selections: F-FM00115296

Attribute	Critical	Weight Factor	Weight Null	Weight Neg	Occurrences	Minimum	Maximum	Base UOM
Item Name	<input type="checkbox"/>	1000	0	0	0			
Stem Length	<input type="checkbox"/>	10	1	1	18	1	1.375	in
Stem Size	<input type="checkbox"/>	10	1	1	18	0.3125	0.4375	in
Item Height	<input type="checkbox"/>	1	1	1	24	2.625	6.25	in
Wheel Width	<input type="checkbox"/>	1	1	1	24	0.8125	1.25	in
Attaching Bolt Size	<input type="checkbox"/>	0	0	0	6	0.25	0.25	in
BALL DIAMETER	<input type="checkbox"/>	0	0	0	18	2	2	in
Bar Code Number	<input type="checkbox"/>	0	0	0	0			
BEARING STYLE	<input type="checkbox"/>	0	0	0	24	Delrin	Delrin	
Bolt Hole Spacing	<input type="checkbox"/>	0	0	0	6	13/16 x...	13/16 x...	
Color 1	<input type="checkbox"/>	0	0	0	24	Black	Chrome	

Attribute Data Grid is used to set weighting factors critical to the cluster analysis

Results are displayed in the lower grid. This cluster analysis returned items with similar / same technical characteristics.

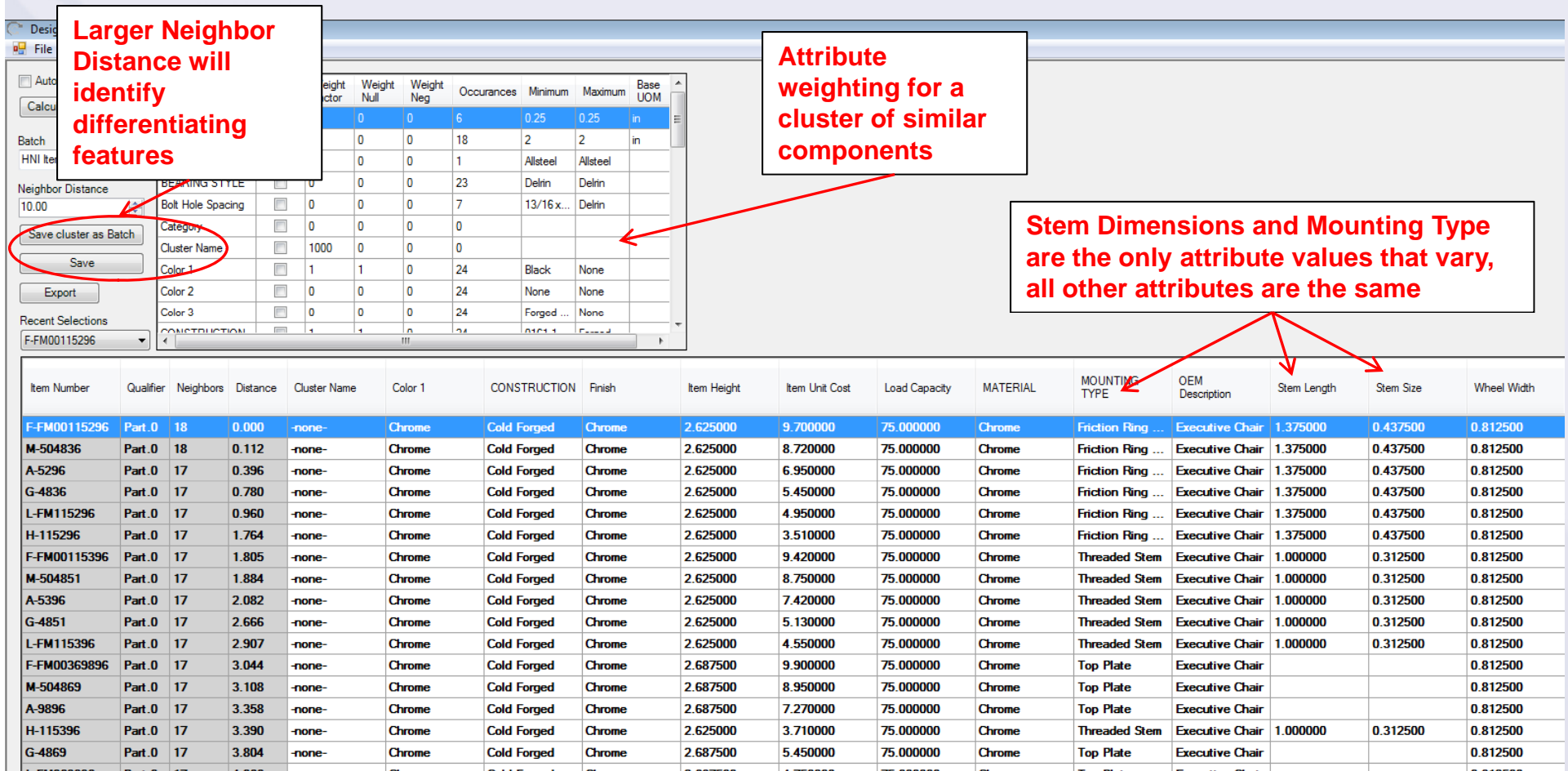
Item Number	Qualifier	Neighbors	Distance	Item Unit Cost	Vendor Item Number	Vendor Name	Cluster Name	Item Height	Stem Length	Stem Size	Wheel Width
F-FM00115296	Part.0	5	0.000	9.70...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500
H-115296	Part.0	5	0.000	3.51...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500
A-5296	Part.0	5	0.000	6.95...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500
G-4836	Part.0	5	0.000	5.45...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500
L-FM115296	Part.0	5	0.000	4.95...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500
M-504836	Part.0	5	0.000	8.72...	9FM00115296	E. R. Wagner	9FM00115296	2.625000	1.375000	0.437500	0.812500

6 Different Business Units

- **Technical Attributes are same for clustered items – Friction Ring Stem caster**
- **Internal Item Numbers for same caster are different among 6 business units**
- **Supplier Part numbers are same from all 6 variations of the item number**
- **Item Unit Cost varies from \$3.51 to \$9.70 for the same item**



Sample Analytics: identify differentiating features that may not be value added



- Components only vary by Mounting Type and Stem Dimensions
- Unit Cost vary from \$3.51 to \$10.50 for very similar components
- Short Term Benefit - address supplier pricing variances for similar items
- Long Term Benefit – standardize on mounting and installation configurations

Key Discoveries from this cluster analysis

Summary – Different industries have their own ways of achieving part standardization and deriving value

1 Oilfield Services

- ✓ Data classification driven by ERP migration
- ✓ Duplication consolidation on buy parts across businesses
- ✓ Normalization of data e.g. material specs, naming conventions, etc.



2 Aerospace & Defense

- ✓ Enhancing part selection process with advanced attribute search
- ✓ Mitigating obsolescence issues with third party content integrations
- ✓ Promoting the reuse of std parts – reliable and high quality



3 Appliance

- ✓ Focused classification on purchased items
- ✓ Identification of unnecessary differentiation via clusters
- ✓ Promoting the classification and governance of new parts
- ✓ Roadmap to STD Parts



THANKS AND QUESTIONS

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