

Capacitor Data Value Analysis



Summary and General Observations

- \$10 M total spend on Capacitors – across different divisions
- 1250 Capacitors provided – we generated over 29,500 values for the analysis
- Convergence harvested data from MFG part numbers.
- 12% (150) of the capacitors were exact duplicates based on MFG part number
- 27% (338) of the capacitors were duplicates based on key attributes
- 35% (438) of the capacitors were near duplicates based on key attributes
- \$216k Annual Savings due to eliminating 80 new part requests (20% of 400/yr)
- \$190k Annual Savings from pricing rationalization from top 20 (90 capacitors) cluster groupings(27% of spend)

Key Terms for Duplicate Parts:

- Exact Duplicate – Same MFG Part Number
- Duplicate – Same key attribute values (not all attributes)
- Near Duplicate – Very similar key attribute values
- Key attribute – subset of attributes typically used to identify a part in a search query. Usually the most important characteristics.

Convergence Data Overview



Our Mission

Help our customers extract more value out of their enterprise systems with improved part data.

19 Years Experience

- Providing services to
- Aerospace/Defense
 - Electronics
 - Automotive/Industrial
 - Consumer/White Goods
 - Oil/ Gas

Enrich & Normalize

Data from disparate sources (Purchased parts, MRO, design parts, etc.)

Prepare

Data for migrations: ERP, PLM, MDM, PIM

Support

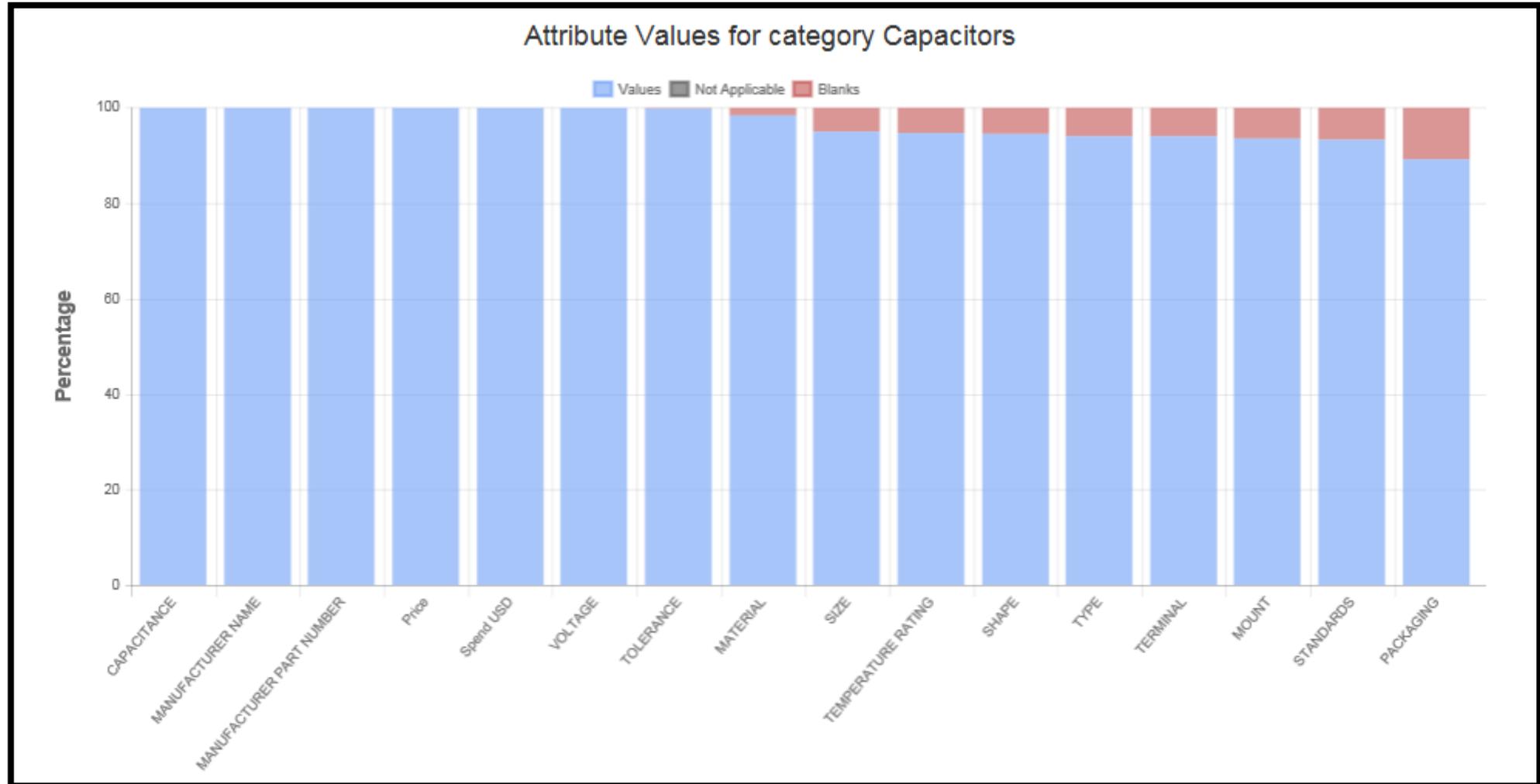
Parts re-use initiatives, mitigate parts proliferation

Provide

- 1) Analytics supporting cost reductions – duplicates, near duplicates
- 2) Customer friendly data

Population Report: Capacitors

- Number of Capacitors – 1400
- Chart below describes fill rates for key attributes
- Started with 12,456 attributes
- Ended with 49,080 attributes
- **Over 36,500 attribute values generated for the 1400 capacitors**



Classification Structure - Capacitors

Example of 1 Capacitor

31 Attribute Values

Category: Root\Sample Parts\Electrical\Computers\Passives\Capacitors

Name: Capacitors
Description: Capacitors

Category Attributes

Attributes	Properties	Responsible Users	User Resources	Attachments	Category Processing	Display Order
Attribute Name	Description	Data Type	Measure	Required	Status	Groups
Item Number						
Revision						
Qualifier						
Item Description						
Legacy Item Number						
Release Date						
CAPACITANCE	CAPACITANCE	Numeric	F	Yes	In Work	
CASE STYLE	CASE STYLE	String	NO UNITS	Yes	In Work	
DIELECTRIC	DIELECTRIC	String	NO UNITS	Yes	In Work	
KVA RATING	KVA RATING	String	NO UNITS	Yes	In Work	
MATERIAL	MATERIAL	String	NO UNITS	Yes	In Work	
MOUNT	MOUNT	String	NO UNITS	Yes	In Work	
PACKAGING	PACKAGING	String	NO UNITS	Yes	In Work	
SIZE	SIZE	String	NO UNITS	Yes	In Work	
TEMPERATURE RATING	TEMPERATURE RATING	String	NO UNITS	Yes	In Work	
TERMINAL	TERMINAL	String	NO UNITS	Yes	In Work	
TOLERANCE	TOLERANCE	String	NO UNITS	Yes	In Work	
TYPE	TYPE	String	NO UNITS	Yes	In Work	
VOLTAGE	VOLTAGE	Numeric	V	Yes	In Work	
Actual Currency	Actual Currency	String	NO UNITS	Yes	New	BA
Adjusted Cost Component	Adjusted Cost Component	String	NO UNITS	Yes	New	BA
Conversion	Conversion	String	NO UNITS	Yes	New	BA
Cost Per unit in raw curr...	Cost Per unit in raw curr...	String	NO UNITS	Yes	New	BA
Cost Per unit in USD Co...	Cost Per unit in USD Co...	String	NO UNITS	Yes	New	BA
Curr.Price Component	Curr.Price Component	String	NO UNITS	Yes	New	BA
Description Component	Description Component	String	NO UNITS	Yes	New	BA
Direct material Component	Direct material Component	String	NO UNITS	Yes	New	BA
DM MU Component	DM MU Component	String	NO UNITS	Yes	New	BA
Excise Rate	Excise Rate	String	NO UNITS	Yes	New	BA
Function Sub-Assembly	Function Sub-Assembly	String	NO UNITS	Yes	New	BA

Item Information

CAPACITANCE (UF) *	470.0000000000	QUANTITY *	500
MATERIAL *	ALUMINUM BODY	NOUN *	CAPACITOR
MOUNT *	THROUGH HOLE	MODIFIER *	ELECTRICAL
PACKAGING *	BULK	BMS_ID *	BMS_0005
SIZE *	10MM DIAMETER, 12.5MM LENGTH	Site_Group_Name *	CCS - LEGACY CARRIER
TEMPERATURE RATING *	-55 TO 105DEGC	OEM_Name *	NICHICON
TERMINAL *	RADIAL	OEM_Part_Num *	UVZ1E471MPD1TD
TOLERANCE *	±20%	Current_Supplier *	FUTURE
TYPE *	ELECTROLYTIC CHIP	Proj_Qty *	8140
VOLTAGE (VDC) *	25.00	Price *	0.0522
MANUFACTURER NAME	NICHICON	Spend USD *	424.91
MANUFACTURER PART NUMBER	UVZ1E471MPD1TD	SUPPLIER NAME	FUTURE
SHORT DESCRIPTION *	CAPACITOR,ELECTRICAL,ELECTROLYTIC CHIP,10MM DIA,12.5MM LG,25VDC,-55 TO 105DEGC	UNSPSC CODE *	32121501
LONG DESCRIPTION *	CAPACITOR, ELECTRICAL, ELECTROLYTIC CHIP, 10MM DIAMETER, 12.5MM LENGTH, 25VDC VOLTAGE, -55 TO 105DEGC TEMPERATURE, ALUMINUM BODY, ±20% TOLERANCE, THROUGH HOLE MOUNT, RADIAL TERMINAL, 470UF CAPACITANCE, ROHS COMPLIANT, CYLINDRICAL SHAPE, BULK PACKAGING, 500 QUANTITY	UNSPSC FULL CLASS PATH *	Fixed capacitors
SHAPE *	CYLINDRICAL	SOURCE URL *	http://www.mouser.com/ds/2/293/e-uvz-880014.pdf
STANDARDS *	ROHS COMPLIANT		

Capacitors

Cleansed Data Comparison

Search Results Show Categories												
Showing items 1-25 of 944 Export												
1 2 3 4 5 6 7 8 9 10 ... >>												
	BMS_ID	Qualifier	Item Description	SHORT DESCRIPTION	CASE STYLE	MATERIAL	MOUNT	SIZE	CAPACITANCE(uF)	VOLTAGE(VDC)	Price	Supplier Name
Add to Cart	030062	Part.BUSINESSUNIT_1	Cap, Ceramic, 0.1uF, 50V, SMD, 1206	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.6MM WD,3.2MM LG,1.8MM THK,50VDC,?10% TOL	1206	CERAMIC BODY, TIN TERMINAL	SURFACE	1.6MM WIDTH, 3.2MM LENGTH, 1.8MM THICKNESS	0.1	50	0.005	AVNET
Add to Cart	030063	Part.BUSINESSUNIT_1	Cap, Ceramic, 1uF, 25V, SMD, 1206	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.6MM WD,3.2MM LG,1.8MM THK,25VDC,10000	1206	CERAMIC BODY, TIN TERMINAL	SURFACE	1.6MM WIDTH, 3.2MM LENGTH, 1.8MM THICKNESS	1	25	0.0071	VENKEL
Add to Cart	030082	Part.BUSINESSUNIT_1	Cap, Ceramic, 270pF, 50V SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?5% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	270	50	0.0038	AVNET
Add to Cart	030083	Part.BUSINESSUNIT_1	Cap, Ceramic, 10pF, 50V, SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?5% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	10	50	0.0029	AVNET
Add to Cart	030084	Part.BUSINESSUNIT_1	Cap, Ceramic, 22pF, 50V, SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?5% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	22	50	0.0024	AVNET
Add to Cart	030085	Part.BUSINESSUNIT_1	Cap, Ceramic, 47pF, 50V, SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?5% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	47	50	0.0027	AVNET
Add to Cart	030086	Part.BUSINESSUNIT_1	Cap, Ceramic, 100pF, 50V SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?5% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	100	50	0.0024	AVNET
Add to Cart	030089	Part.BUSINESSUNIT_1	Cap, Ceramic, 0.01uF , 50V, SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?10% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	0.01	50	0.002	AVNET
Add to Cart	030090	Part.BUSINESSUNIT_1	CAP, Ceramic, 0.1uF, 50V, SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,50VDC,?10% TOL	0805	CERAMIC BODY, TIN TERMINAL	SURFACE	1.25MM WIDTH, 2MM LENGTH, 1.35MM THICKNESS	0		0.0021	AVNET
Add to Cart	030092	Part.BUSINESSUNIT_1	Cap, Ceramic, 1uF, 50V, SMD, 1206	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.6MM WD,3.2MM LG,1.8MM THK,50VDC,?10% TOL	1206	CERAMIC BODY, TIN TERMINAL	SURFACE	1.6MM WIDTH, 3.2MM LENGTH, 1.8MM THICKNESS	1		0.0095	VENKEL
Add to Cart	030093	Part.BUSINESSUNIT_1	CAP, Ceramic, 10uF, 10V, SMD, 1206	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.6MM WD,3.2MM LG,1.8MM THK,10VDC,?20% TOL	1206	CERAMIC BODY, TIN TERMINAL	SURFACE	1.6MM WIDTH, 3.2MM LENGTH, 1.8MM THICKNESS	10	10	0.0108	VENKEL
Add to Cart	030103	Part.BUSINESSUNIT_1	Cap, Ceramic, 0.33uF, 25V, SMD, 1210	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,2.5MM WD,3.3MM LG,0.94MM THK,25VDC,4000	1210	CERAMIC BODY, TIN TERMINAL	SURFACE	2.5MM WIDTH, 3.3MM LENGTH, 0.94MM THICKNESS	0.33	25	0.0228	FUTURE
Add to Cart	030104	Part.BUSINESSUNIT_1	Cap, Aluminum Electrolytic, 100uF, 16V, SMD, --	CAPACITOR,ELECTRICAL,ELECTROLYTIC V CHIP,6.3MM	2626	ALUMINUM B TIN TERMINAL		ER, 6MM	100	16		
Add to Cart	030154	Part.BUSINESSUNIT_1	Cap, Ceramic, 10uF, 10V SMD, 0805	CAPACITOR,ELECTRICAL,MULTI-LAYER CHIP,1.25MM WD,2MM LG,1.35MM THK,10VDC,?20% TOL	0805	CERAMIC BODY, TIN TERMINAL		, 2MM THICKNESS	10	10		

Numeric Data With UOMs

Normalized Data

Cleansed Supplier Names

Short Description

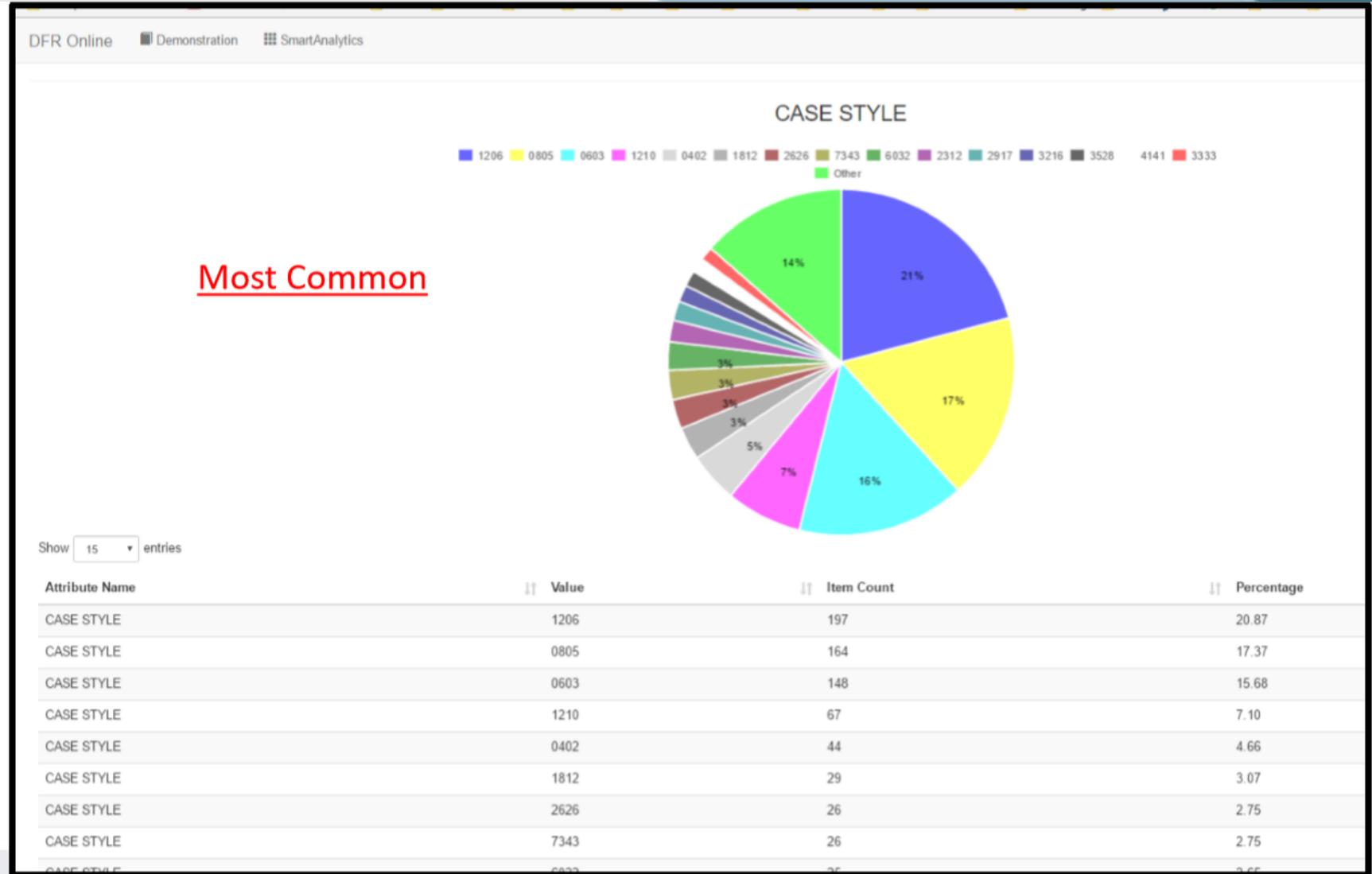


Capacitors – Case Style

- 20% (197) capacitors – most common case style of 1206 value
- Least common case style values below

Value	Item Count
0306	1
0507	1
0512	1
0606	1
0607	1
0806	1
0807	1
1005	1

Least Common

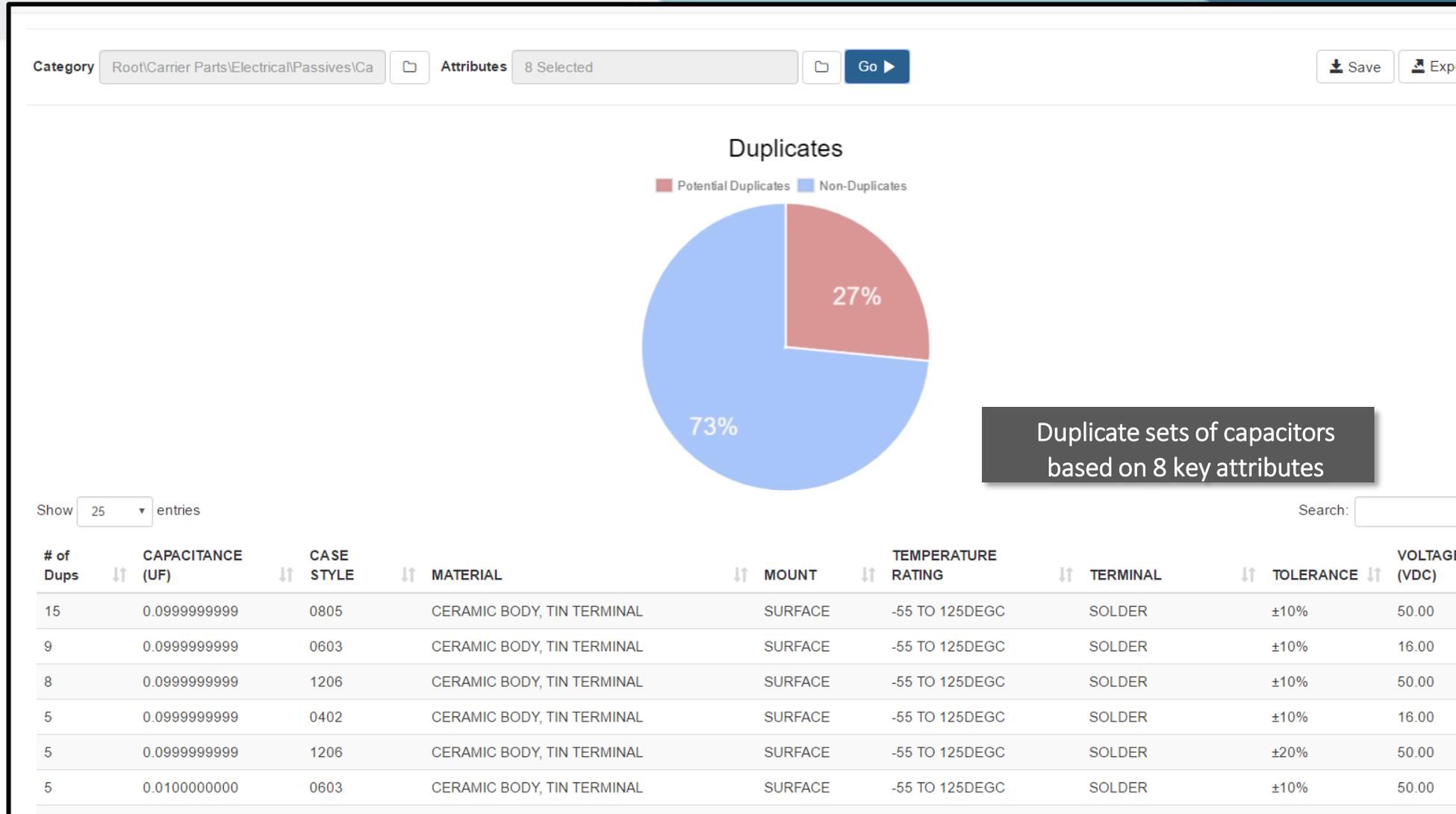


Potential Duplicates – Capacitors

- We found 27% (338) duplicate capacitors based on 8 attributes

Key Terms for Duplicate Parts:

- Exact Duplicate – Same MFG Part Number
- Duplicate – Same key attribute values (not all attributes)
- Near Duplicate – Very similar key attribute values
- Key attribute – subset of attributes typically used to identify a part in a search query. Usually the most important characteristics.



Near Duplicate Cluster Analysis

Capacitors (35%) 438 Near Duplicates

Attribute	Critical	Weight Factor	Weight Null	Weight Neg	Occurrences	Minimum	Maximum	Base Unit
CASE STYLE	<input checked="" type="checkbox"/>	3	5	0	944	0306	7343	NO
CAPACITANCE	<input checked="" type="checkbox"/>	1	0	0	1378	0.1	330000...	pF
MATERIAL	<input checked="" type="checkbox"/>	1	0	0	1357	ALUMI...	TIN TE...	NO
MOUNT	<input checked="" type="checkbox"/>	1	0	0	1288	BOARD	THRO...	NO
TEMPERATURE RA...	<input checked="" type="checkbox"/>	1	0	0	1306	-30 TO...	85DEGC	NO
TERMINAL	<input checked="" type="checkbox"/>	1	0	0	1296	AXIAL	WRAP...	NO
TOLERANCE	<input checked="" type="checkbox"/>	1	0	0	1375	±0.05%	80%, 2...	NO
VOLTAGE	<input checked="" type="checkbox"/>	1	0	0	1334	3.3	5000	V
BMS REMARKS	<input type="checkbox"/>	0	0	0	0			NO
BMS_ID	<input type="checkbox"/>	0	0	0	1379	BMS_0...	BMS_1...	NO

Cluster Attribute Weightings
9 Key attributes
438 Capacitors

- Procurement opportunities to rationalize spend – pricing variances

Neighbors	Distance	CAPACITANCE	CASE STYLE	MATERIAL	MOUNT	TEMPERATURE RATING	TERMINAL	TOLERANCE	VOLTAGE	Current_Supplier	Price	Spend USD
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	AVNET	0.0024	2951.09
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	AVNET	0.0024	7497.92
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	AILUN	0.0018	3051.58
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	XIAMEN XIN...	0.0017	132693.57
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	ARROW	0.003	3336
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	TTI	0.0028	5648.96
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	TTI	0.0026	5647.2
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	AVNET	0.0021	4394.7
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	WALSIN TEC...	0.0025	1887.57
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	FENGHUA (D...	0.0025	1887.57
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	CHARMING	0.0014	1149.22
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	YAGEO	0.002	6518.26
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	WALSIN TEC...	0.0036	889.82
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	AILUN	0.003	4137.56
22	0.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±10%	50.000000	FUTURE	0.0026	356.36
17	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	WRAPAROU...	±10%	50.000000	AVNET	0.0021	5612.07
22	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±5%	50.000000		0.0027	
22	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±20%	50.000000		0.0033	
22	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-55 TO 125D...	SOLDER	±20%	50.000000		0.0039	
22	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-10 TO 85DEGC	SOLDER	±20%	50.000000		0.002	1255.59
22	1.000	100000.000147	0805	CERAMIC BO...	SURFACE	-10 TO 85DEGC	SOLDER	±20%	50.000000	VENKEL	0.0018	9106.59

Similar Capacitors

Different Suppliers

Different Pricing from Different Plants

Capacitors from Different Divisions

- Key Terms for Duplicate Parts:**
- Exact Duplicate – Same MFG Part Number
 - Duplicate – Same key attribute values (not all attributes)
 - Near Duplicate – Very similar key attribute values
 - Key attribute – subset of attributes typically used to identify a part in a search query. Usually the most important characteristics.

Benefit Analysis – Less New Parts

- New Part Request Mitigation: based on the data we conservatively **estimate 20% duplicates capacitors** are being requested each year
 - Assume 400 new capacitors created each year
 - 20% of requests could have reused an existing capacitor or 80 capacitors/year
 - Assume \$2,700 lifecycle costs of a part – design, procurement, inventory, material handling
 - **\$216k – Estimated Annual Savings** – (\$2.7k x 80 Capacitors)

Benefit Analysis – Rationalize Pricing Variances

Min Price Supplier Savings: The min price supplier analysis shows an optimal potential **\$190k**

- Min price – lowest price of capacitor in a cluster
- Total Annual Spend – the total spend for a cluster
- Min Annual Spend – total spend for a cluster based on min price
- Annual savings – (total spend – min annual spend)

Cluster #	# capacitors	total annual spend	min annual spend	annual savings	% Savings
10	90	\$710,000	\$520,000	\$190,000	27%

Note: took the lowest price for each cluster and calculated a new spend - 90 capacitors/10 clusters

Design for Retrieval (DFR)

Back-End

Administrators

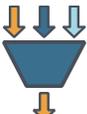
DFR Administration Client

• Windows Azure cloud-based architecture

Front-End

Web users

DFR Online

 <p>Classification Manager</p>	<p>Creation and maintenance of the category structure by adding / editing attributes to a category, submitting category for approval and using the description generator.</p>
 <p>Attribute Manager</p>	<p>Enables the user to create attributes, relationship attributes, image attributes and groups of attributes to set up in the category tree.</p>
 <p>Item Loader</p>	<p>Used to load data in batches and populate items with attribute and relationship values. Attribute data can be added or updated with additional items.</p>
 <p>Data Developer</p>	<p>Allows the assigned user to check, modify or verify the attribute values for each data item assigned to him/her.</p>
 <p>Allowed Values Manager</p>	<p>Allows users to cleanse data, impose rules for creating new data. Users can request an attribute value and workflow for approval/denial of values.</p>

 **Smart Integration**
 SOA / API layer - Framework to integrate with your ERP, PLM, PIM

 **Export Manager**
 Exports categories, category attributes, allowed values and items.

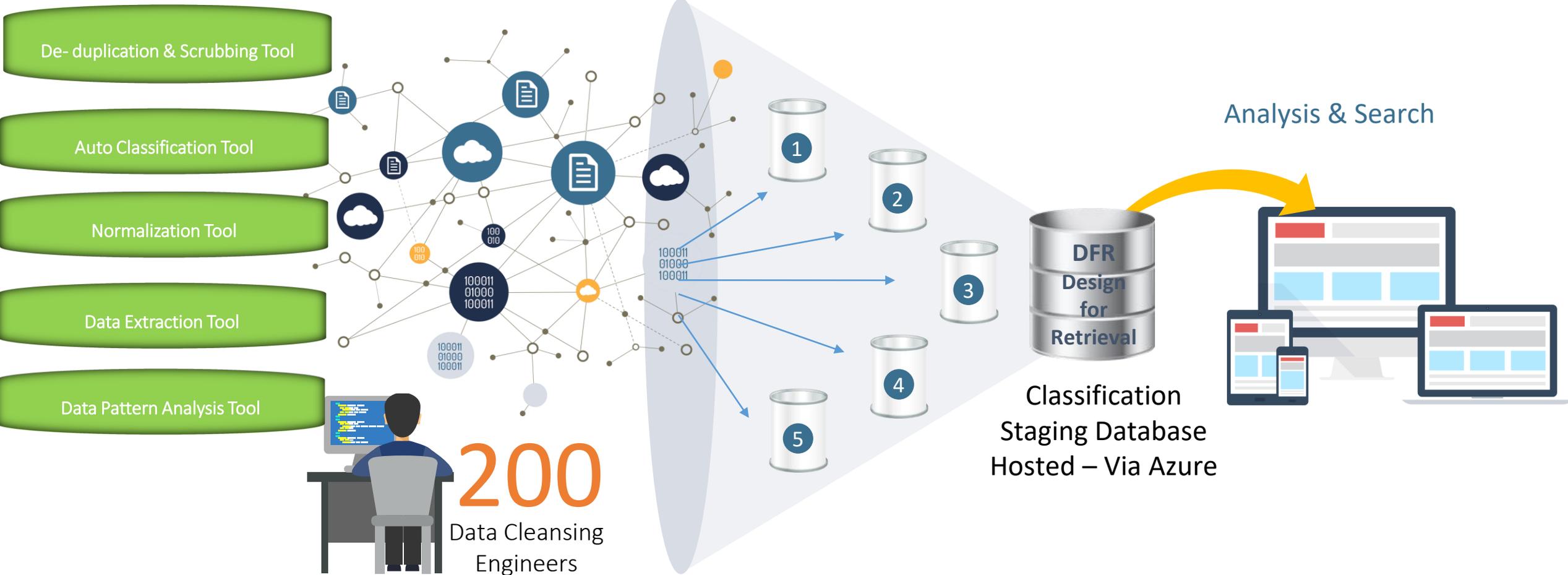
 **Options Manager**
 Direct access to the catalog configurations via the UI.

 **Policy Manager**
 Manages Data rules

 Smart Create	 Smart Find
 Smart Analytics	 Smart Reports
 <p>Administrative User Mgmt. & Permissions</p>	

Leading Provider of Part Data Cleansing Services and Solutions

Harvesting, Classifying, and Enriching Data



Convergence Data PartsLink Data Enrichment Process

