



Transforming Parts for Optimal PLM Effectiveness

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Agenda

1. About  NOV Wellbore Technologies
2. Product Data Quality
 - Challenges
 - Solution and Roadmap
 - Maturity Journey of NOV
3. Solution partner CDS

The background of the slide is a photograph of an oil rig. In the foreground, the back of a worker wearing a white hard hat and a dark blue uniform is visible. The worker's uniform has a white patch on the back with the 'NOV' logo and the text 'NATIONAL OILWELL VARCO'. The worker is looking out over the complex metal structure of the oil rig, which features yellow safety railings and green walkways. The sky is clear and blue.

We are a **global family**
We believe in
purposeful innovation
and service above all

We are the backbone of the oil and gas industry with a singular focus to deliver the finest products and services, on time and on budget, to push our customers' business forward.

NOV Structure



What we do...

Our people deliver technologies that drive new levels of safety, efficiency and productivity

Drilling and
Intervention

Dynamic
Drilling
Solutions

WellSite
Services

IntelliServ

Grant
Prideco

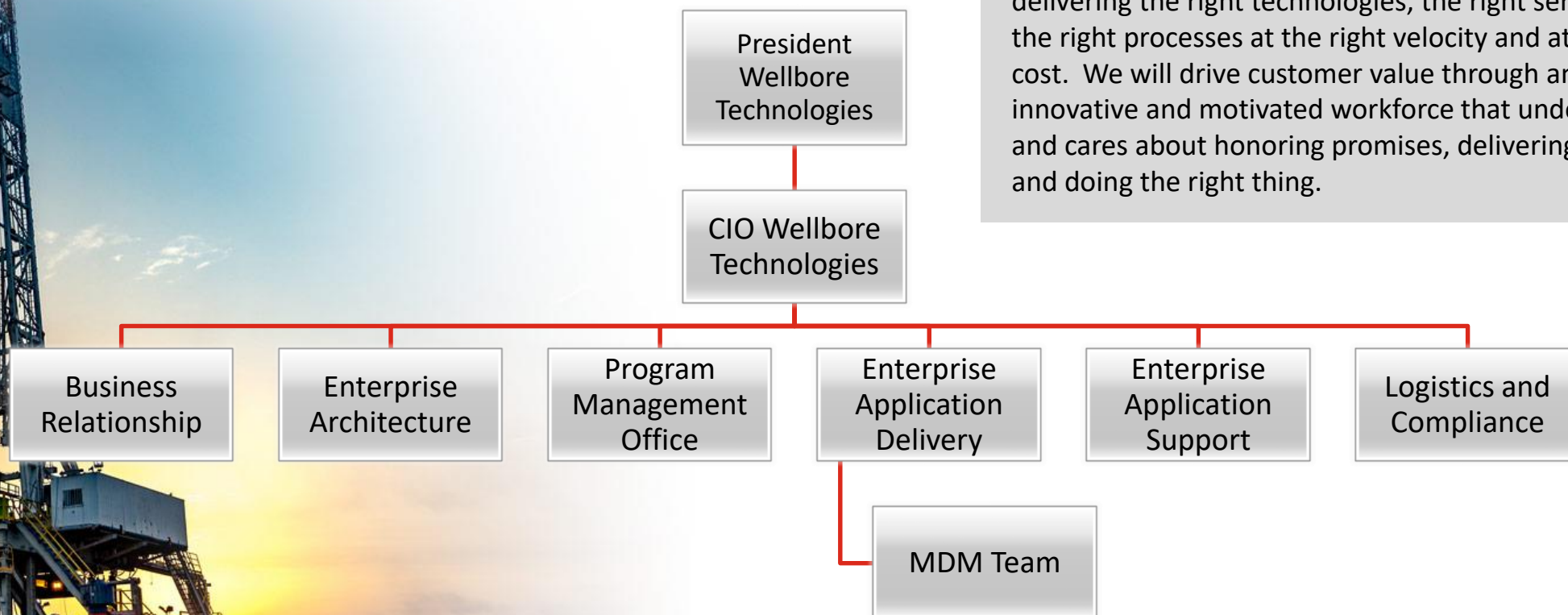
Tuboscope

Design and deliver necessary equipment for optimal performance

Solve operational challenges to optimize productivity

Information Systems

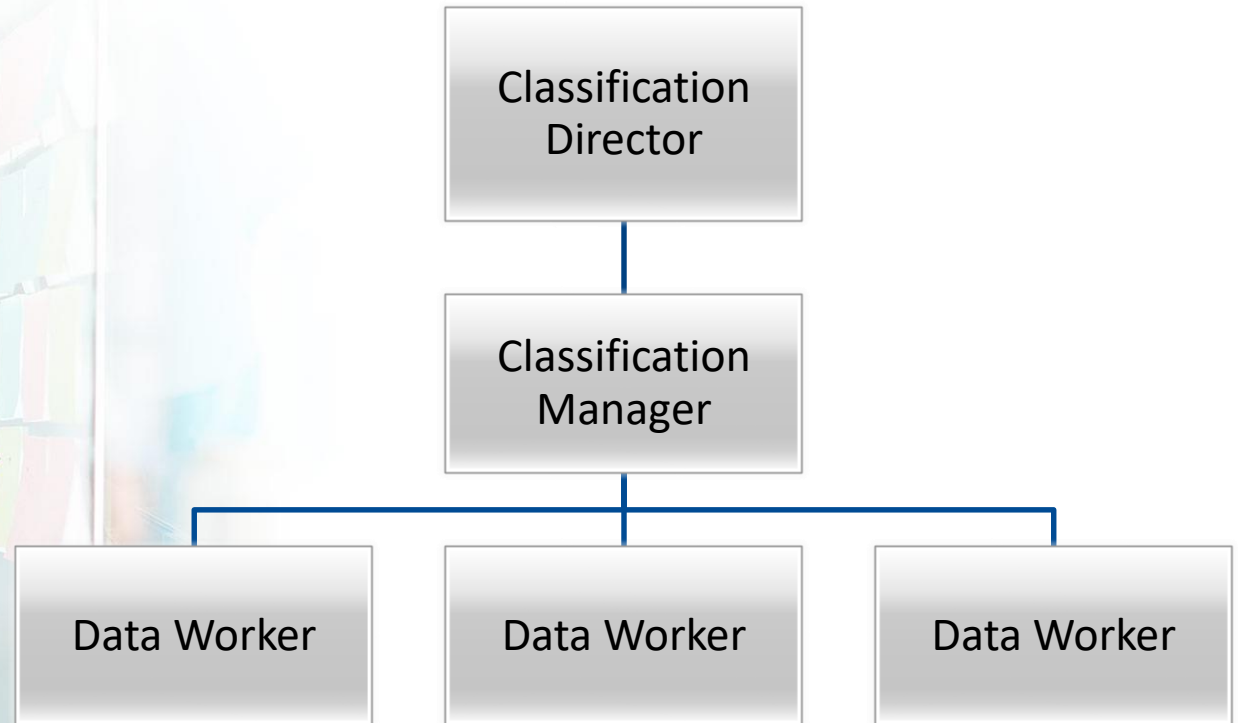
..... The Right ThingsThe Right TimeThe Right Way



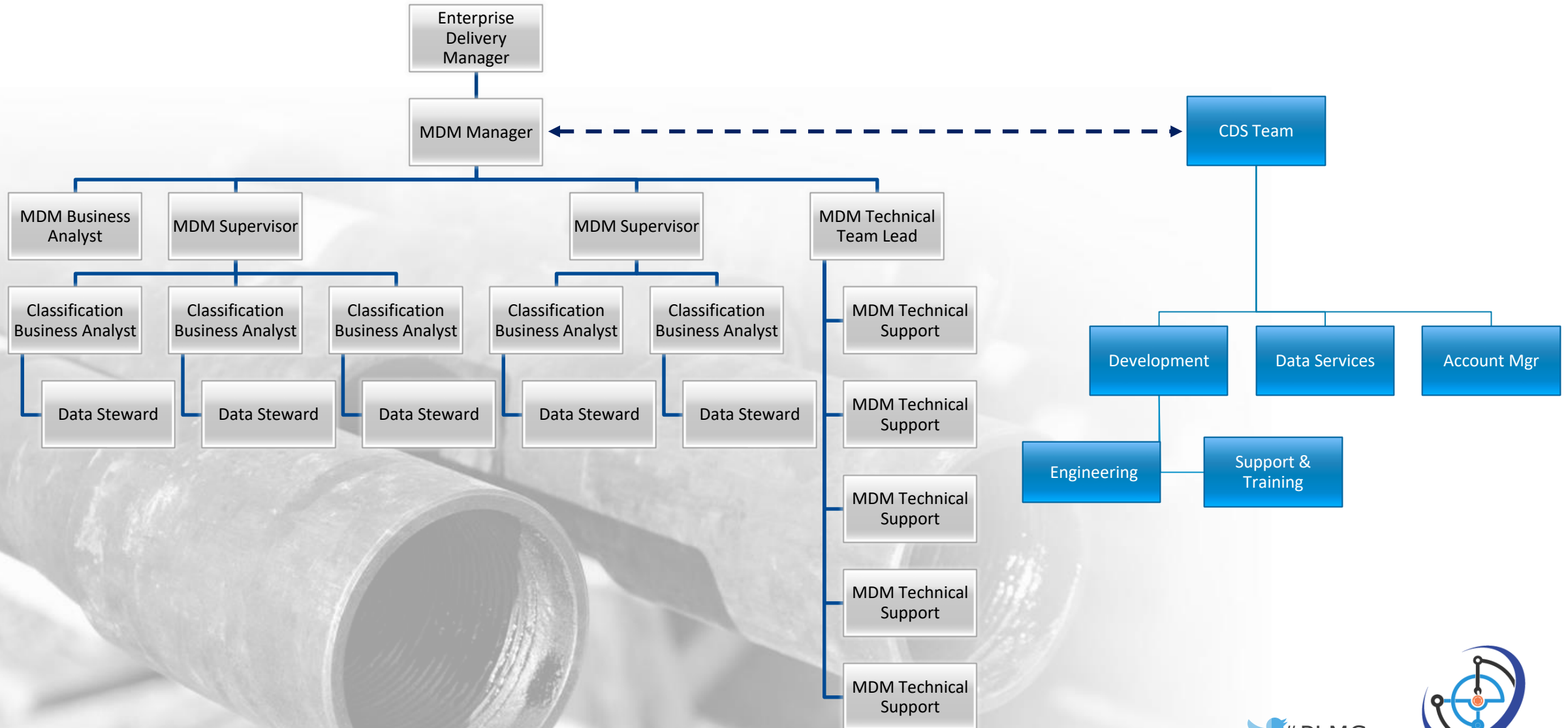
Vision

Wellbore Information Systems is dedicated to delivering the right technologies, the right services and the right processes at the right velocity and at the right cost. We will drive customer value through an innovative and motivated workforce that understands and cares about honoring promises, delivering results and doing the right thing.

Initial Structure – Project Black Diamond



Current Structure – Wellbore IS MDM Team



NOV - Product Data Quality Challenges

Data Quality Strategy

Data Strategy was incomplete for BU's consolidating to JDE.

- **Fragmented Data** manually replicated without common definition of framework
- **Data Quality** is managed independently with no consistency
- **Highly Manual** data quality processes with limited governance

Mergers and Acquisitions

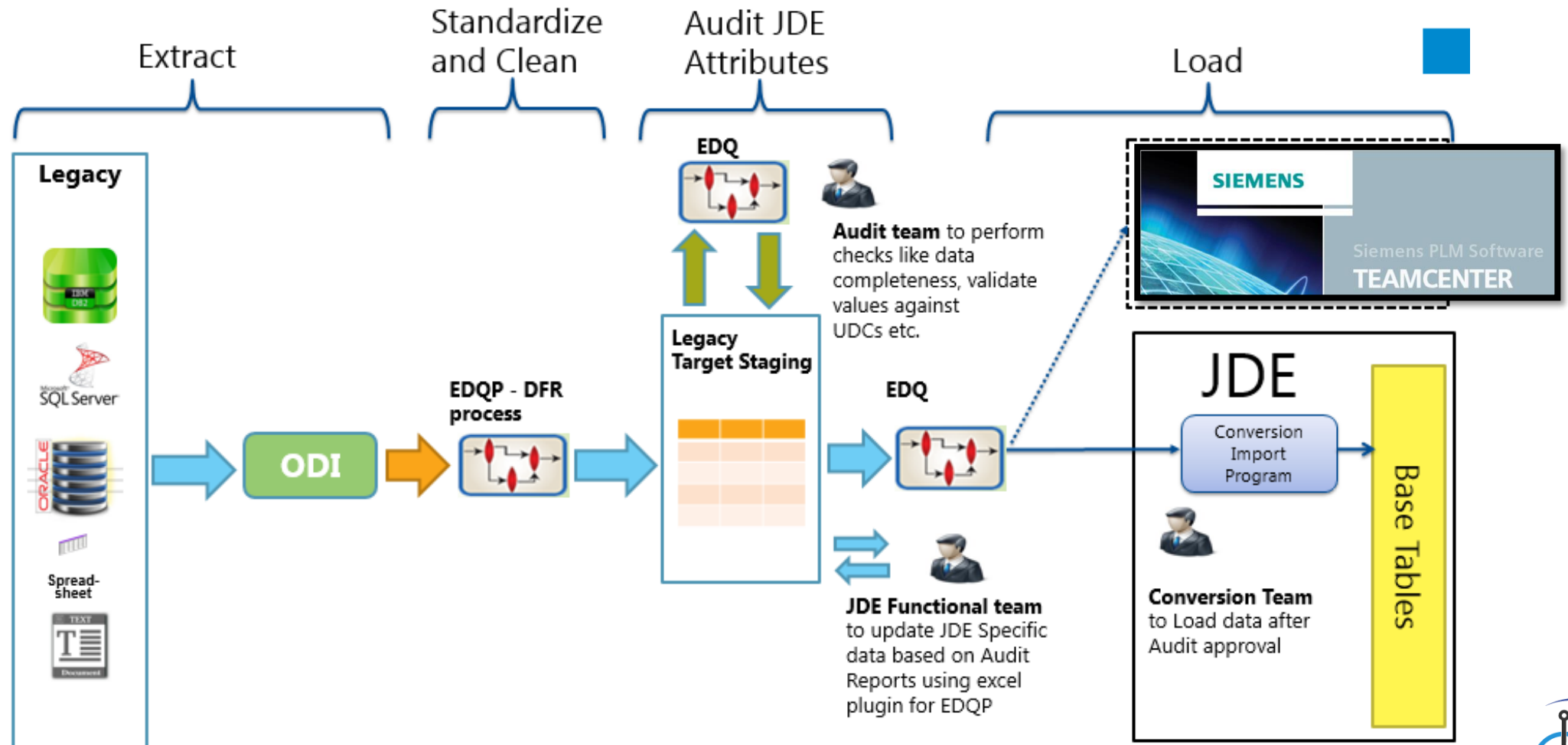
JDE Consolidation Strategy

- **New Acquisitions** come with their own systems and data standards
- The data need to be **normalized, classified, cleansed and de-duplicated** for integration of data into JDE and NOV applications.
- Some tools in place to **automate, manage and govern the process** but still highly dependent on manual efforts and reviews.
- Takes 3-6 months for one **consolidation** project implementation

Maintain Product Data Classification and Attribution

- **Product Hierarchies** changes frequently due to Business restructuring.
- **Manual, difficult and expensive** methods for product classification and attribution

Case Study: NOV - Living process



Before – Data

Duplicates

- Acquisition like businesses
- Uncontrolled data entry

Search Limited

- Descriptions
- Inconsistent abbreviations

Inconsistent Reporting Data

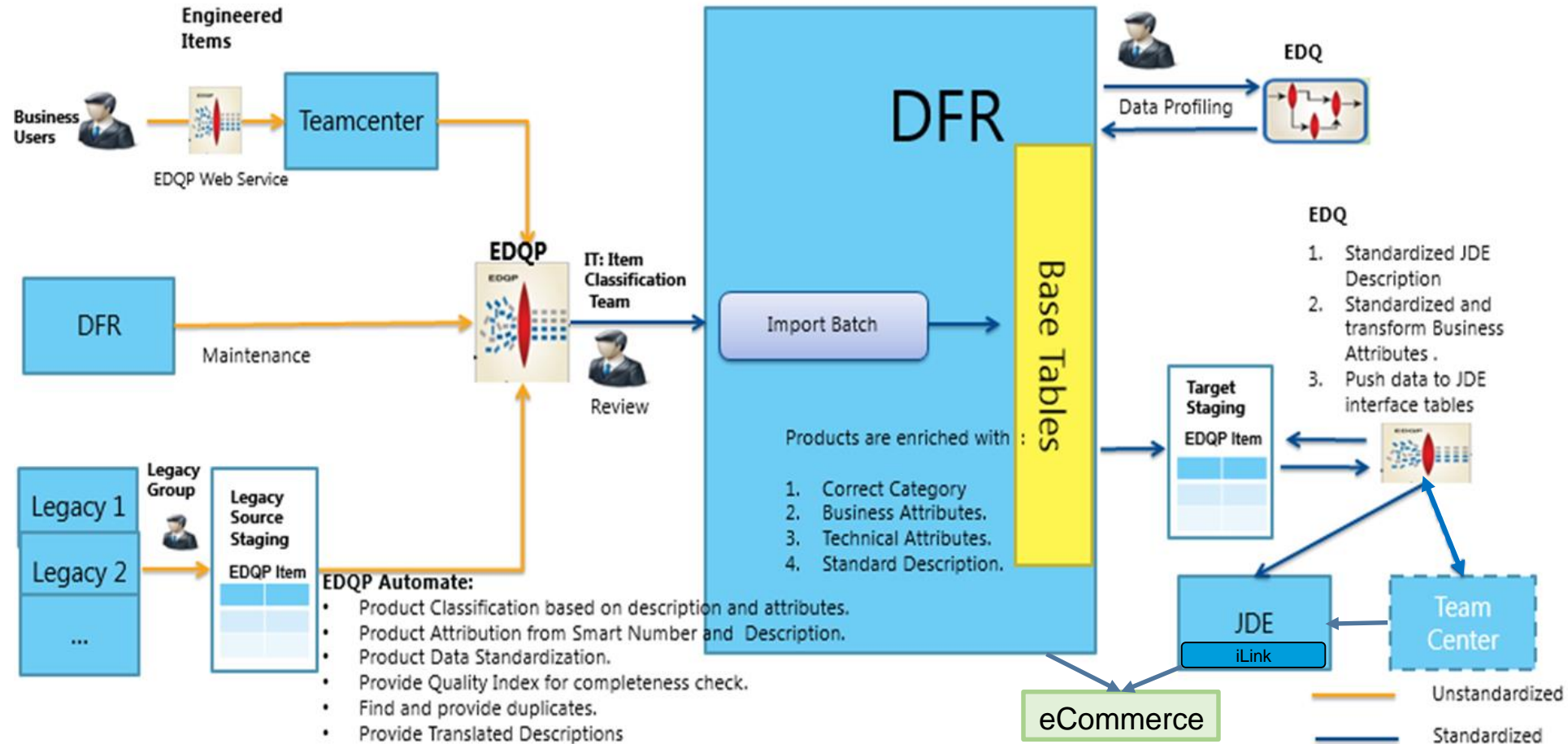
- Unable to define structure to a what it is level
- Lack of Focus on categorization

No Data Governance

NOV Classification process:

	OLD	NEW
Addition of data to project	Excel files comparison	Systematic comparison
Working data by priority	multiple sources – loss of control	Single point entry
Approving data for multiple system use	Inability to set and keep track of multiple rules	Ability to set policies to assist with governance

NOV Highlights - Integration



NOV Highlight – Classification – DFR

The screenshot displays the Design For Retrieval (DFR) software interface, which is used for managing product classification and retrieval. The interface is divided into several panes:

- Classification Manager:** A central pane showing a tree view of product categories. The tree structure includes:
 - Root
 - Completion and Production Solutions iLink
 - Non-Parts
 - Rig Systems iLink
 - Wellbore Technologies
 - ANSI Pipe and Fittings
 - API Tube and Fittings
 - Artificial Lift
 - Charges
 - Commodities
 - Controls
 - DH Downhole
 - Documentation
 - Drilling and Intervention
 - Borehole Enlargement
 - Coring
 - Customer Training
 - Drilling Agitator
 - Drilling Motors
 - Fishing Tools
 - ICT
 - Mfg Components
 - Motor Technologies
- Item Details:** A pane on the right showing the details of a selected item. It includes fields for Name, Description, and a list of Developers and Approvers.
- Legacy Item Number Release Date:** A table showing the release dates for various legacy items.
- Template Editor:** A pane at the bottom showing the configuration of templates for item classification.

The **Legacy Item Number Release Date** table contains the following data:

Legacy Item Number	Release Date
Legacy Short Description 1	IMDSC1 - 1st 30 Charac...
Legacy Short Description 2	IMDSC2 - 2nd 30 Chara...
Legacy Long Description	Longest Description in J...
Name	The name of the produc...
Other Features	Free form text could be ...
New JDE Description 1	New JDE Description 1
New JDE Description 2	New JDE Description 2
JDE Long Description	This is the description th...
New Search Text	Search Text Generated ...
Search Text	Search Text
Legacy Internal Attach...	EDQP SZTEXT 1, JDE Int...
Product Line	SRP1 - Sales Catalog C...
Product Type	SRP2 - Product Type in ...
Product Component	SRP3 - Product Compon...
Product Series	SRP5 - Product Series ...
Legacy Product Line	SRP0 - Legacy Product ...
Product Brand	PRP9 - Product Brand in ...
Product Family	PRPRODF on F4117 - Pr...
Product Model	PRPRODM on the F4117...
Part Status	Active = Current JDE Q...
Primary UOM	Primary Unit of Measure
Lifecycle	Teamcenter Product Lif...

The **Template Editor** pane shows the configuration of templates for item classification. It includes a list of templates and a detailed view of the selected template's configuration.

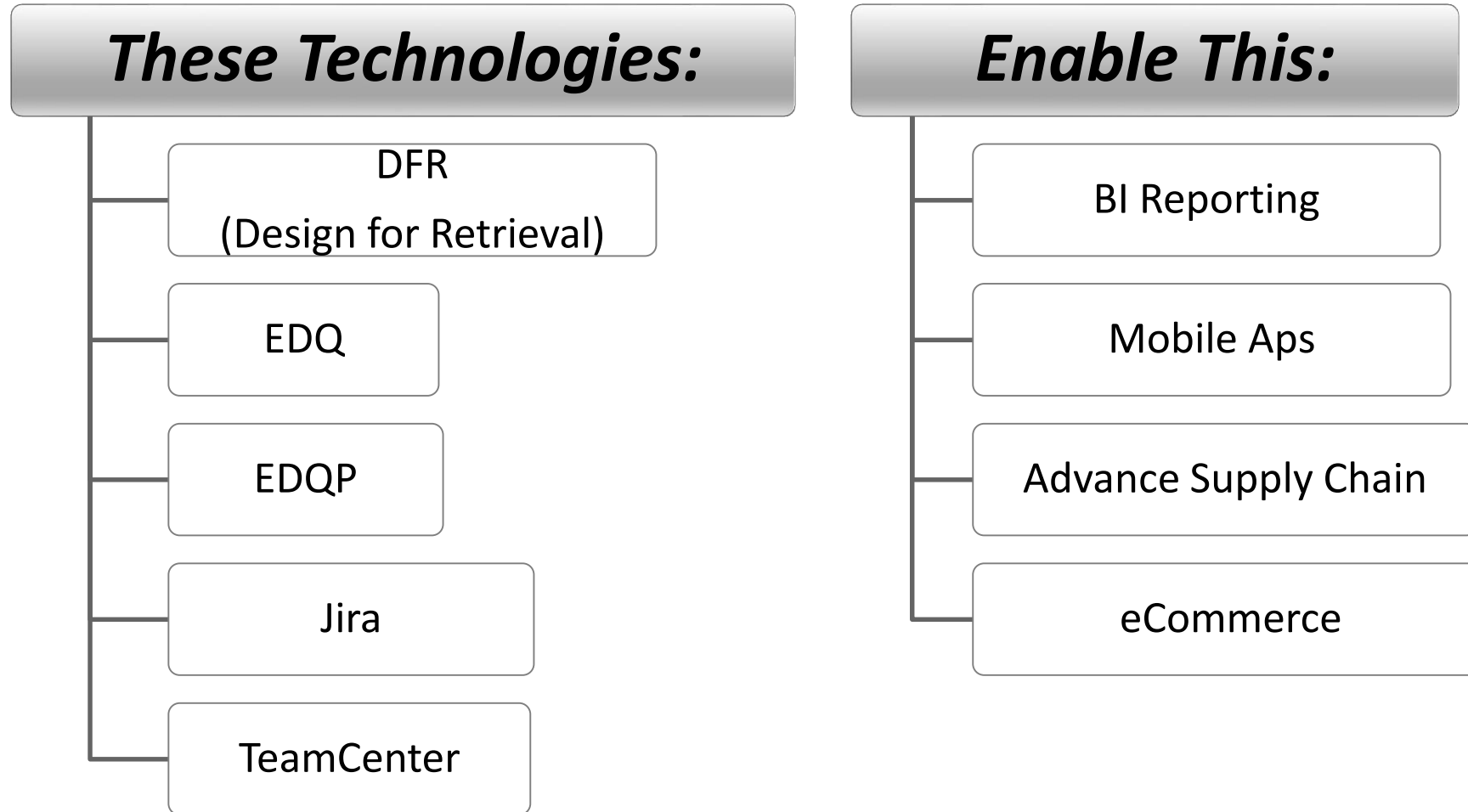
NOV Highlight – Classification - Teamcenter

The screenshot displays the Teamcenter Classification interface. On the left, the **Data Model** tree shows a hierarchy starting with **Wellbore Technologies**, including **ANSI Pipe and Fittings**, **API Tube and Fittings**, **Artificial Lift**, **Charges [4]**, **Commodities**, **Controls**, **Documentation [48]**, **Drilling and Intervention**, **Fishing Tools**, **Accessories**, **Fishing Tools**, **Overshot**, **Series 10 and 20**, **Series 150**, **Basket Grapple [0]**, **Basket Grapple Control [0]**, **Basket Mill Control Packer [0]**, **Basket Plain Control Packer [0]**, **Spiral Grapple [0]**, **Spiral Grapple Control [0]**, **Series 70**, **Wide Catch**, **Manifold Fittings**, **Manufacturing Components**, **Nameplates**, and **Pipe Handling**. The **Attributes** section in the center lists various properties like **Catch Size Numeric**, **Catch Size 2**, **Material**, **Stop Type**, **Wicker Style**, **Grapple Number**, **Helix Orientation**, **Tool Orientation**, **Component Of**, **Assembly Number**, **Other Features**, **Version**, **Overshot Series**, **NOV Material Specification**, and **Spec Information-Unverified**. The **Categories** section on the right shows a list of values for the **Stop Type** attribute: **LONG CATCH STOP** (highlighted), **NO STOP**, and **SHORT CATCH STOP**. A blue banner at the bottom reads **Teamcenter Classification**.

NOV Process

- **Importing structure** and parts from Teamcenter
- DFR to Teamcenter **UOM mapping**
- **Teamcenter Id generation** for exporting new structure
- **Exporting PLM XML** formats for both structure and parts
- **Policy Manager** rules to help control structure and part data to not violate Teamcenter rules

NOV Classification Technologies:



4 Classification Enabled Technology

1

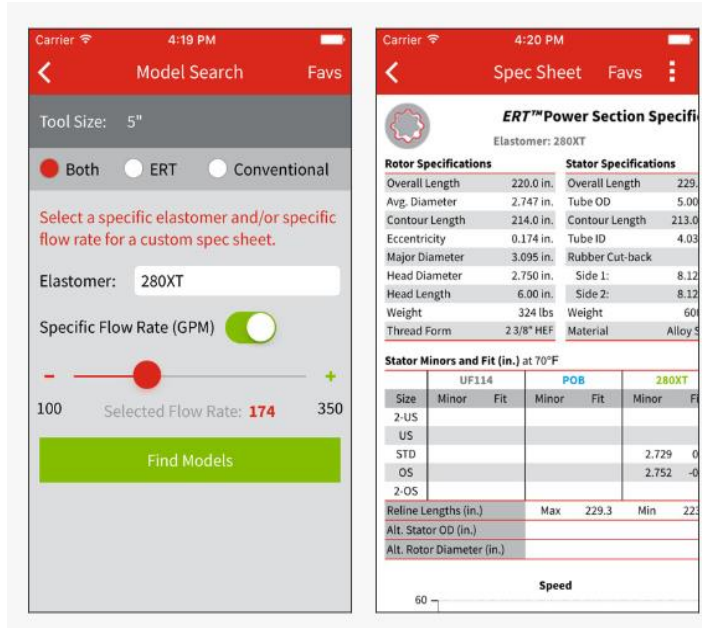
B. I. Reporting



2

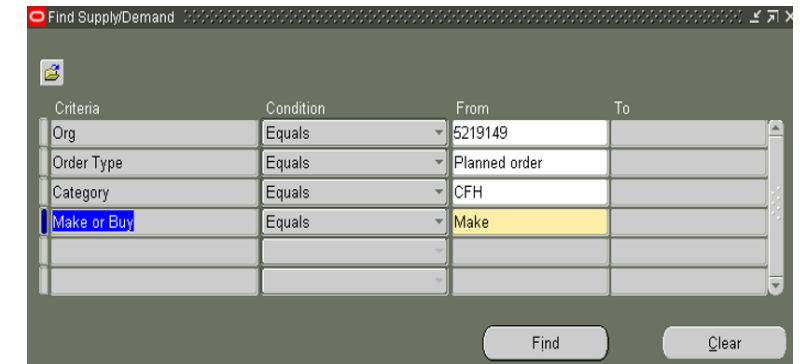


Mobile App –
NOV Power Sections

Two screenshots of a mobile application interface. The left screenshot shows a 'Model Search' screen with a red header, a back arrow, and a 'Favs' button. It includes a 'Tool Size' dropdown set to '5"', radio buttons for 'Both', 'ERT', and 'Conventional', a text input for 'Elastomer: 280XT', a 'Specific Flow Rate (GPM)' slider with a green toggle, and a 'Find Models' button. The right screenshot shows a 'Spec Sheet' screen with a red header, a back arrow, and a 'Favs' button. It displays 'ERT™ Power Section Specifications' for 'Elastomer: 280XT'. It includes two tables: 'Rotor Specifications' and 'Stator Specifications'. Below these is a table for 'Stator Minors and Fit (in.) at 70°F' with columns for 'Size', 'Minor', 'Fit', 'Minor', 'Fit', 'Minor', and 'Fit'. At the bottom, there is a 'Speed' section with a '60' value.

3

Advanced Supply
Chain Planning

A screenshot of a 'Find Supply/Demand' interface. It features a table with four columns: 'Criteria', 'Condition', 'From', and 'To'. The table contains several rows of data, including 'Org' with '5219149', 'Order Type' with 'Planned order', 'Category' with 'CFH', and 'Make or Buy' with 'Make'. At the bottom, there are 'Find' and 'Clear' buttons.

Online Sales Portal – 24 hr sales!

<https://wbt.nov.com/Default.aspx>

Wellbore Technologies

Bowen™ Fishing Tools Motor Technologies Service Equipment Help

Home > Bowen™ Fishing Tools > 1000 - External Catch Fishing Tools > 1010 - Sucker Rod Overshot > Basket Grapple

Basket Grapple

Search

Search By Filter By

Catch Size Equals

Add Filter Clear Filter

Items Per Page 20 Sort by Item Number A to Z

Table Expanded List

Compare Add to List

1 2 3 4 5 6 7 8 9 10 ...

1-1/16
1-1/2
1-1/4
1-1/8
1-11/16
1-13/16
1-15/16
1-15/32
1-19/32
1-3/16
1-3/4
1-3/8
1-5/16
1-5/8
1-7/16
1-7/8
1-9/16
1.315
1.600

1

DFR Categories
& Attributes

4

Category and attribute properties in DFR drive online sales portal navigation – searching, comparing products.

Category: Root\Wellbore Technologies\Drilling and Intervention\Fishing Tools

Name Basket Grapple

Description Wellbore Technologies\Drilling and Intervention

Attributes Properties Responsible Users User Resources

Property	Value
UNSPSC	20121717
Release Date Alias	<Empty>
eCommerce	True
Catalog Name	Bowen™ Fishing Tools
Business Segment	WBT
Terminating Node	Yes
	<Empty>
	Basket Grapple

Fishing Tools

- Die Collar
- Overshot
 - Series 10 and 20
 - Series 150
 - Assembly
 - Basket Grapple
 - Basket Grapple Control
 - Basket Mill Control Pack
 - Basket Plain Control Pack
 - Bowl
 - Break-Out Clamp
 - Collar Stop
 - Extension Sub
 - Guide
 - High Pressure Packoff
 - Inner Seal
 - Lock Ring
 - Mill Extension
 - Mill Insert
 - Packer
 - Spiral Grapple
 - Spiral Grapple Control
 - Thread Protector
 - Top Sub
 - Series 70
- Wide Catch Spear

DFR Data Model

Assisting NOV



Our Mission

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

15 Years
Experience

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

Cleanse & 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

Analytics supporting cost reductions & classification search





1

Load Parts Here



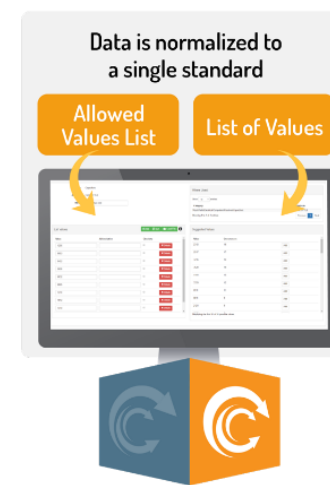
2

Build Data Model



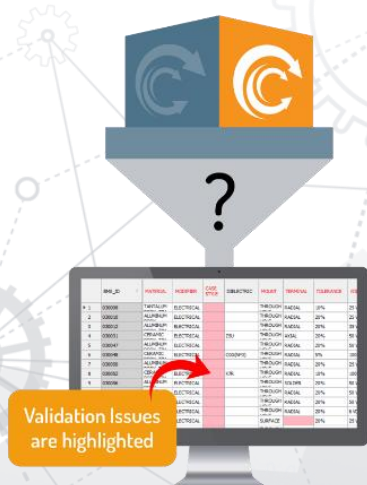
3

Data Harvesting



4

Data Normalization



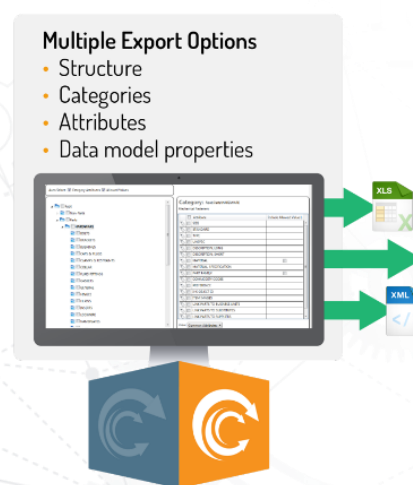
5

Data Validation



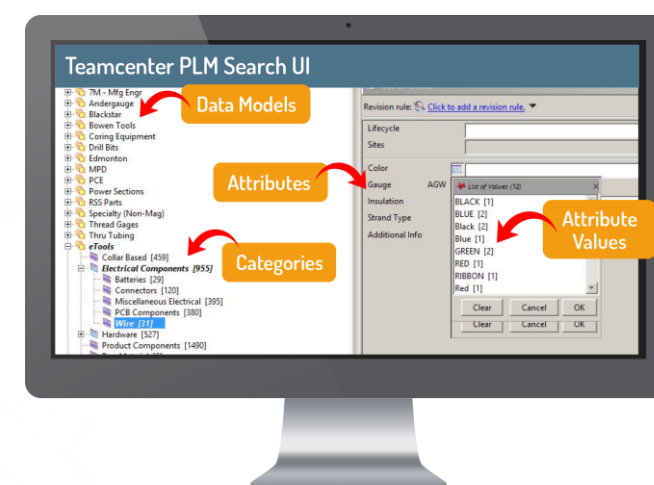
6

Policy Manager



7

Export Manager






8

Enhanced TeamCenter Search



Clean Up Your Legacy Data

Easily jump start your classification project with CDS Data Services

-  Find hidden parts
-  Identify duplicate parts
-  Add attribute data for PLM classification
-  Enter consistent descriptions
-  Categorize your parts correctly



www.convergedata.com



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- Select “Take Survey”

Melissa Haught, National Oilwell
Alison Luna, Convergence Data



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