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Americas' SAP Users' Group

Data Quality and Master Data Strategy for the Journey to SAP S/4HANA
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Data Services & Governance Manager
A. O. Smith
Session ID # ASUG83250

About the Speakers ~ A. O. Smith

Michael Dees

- Data Services & Governance Manager
- With A. O. Smith - 27 Years
- Involved with Data - 19 Years
- Involved with 3 ERP implementations

Chris Clark

- Data Solutions Architect
- With A. O. Smith – 3 Years
- Worked in IT – 13 Years
- Went skydiving day before wedding

Key Outcomes/Objectives

➢ Identify what did **_not_** work at A. O. Smith

➢ Describe the Data Management Direction Change

➢ Share the Data Management Rollout Plan Going Forward

Agenda

➢ Brief Company Overview

➢ ECC6 Rollout - Initial Data Approach

➢ Data Realization

➢ Course Correction – Intentionally heading toward S/4HANA??

➢ Addressing Cultural Change

➢ MDM Rollout Plan

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A. O. Smith Products

Product Categories

Residential Heaters & Boilers

| Residential Hybrid Electric | Residential Electric | Tankless | Residential | Residential Gas | Combi | Lochinvar "Knight" |

Commercial Heaters & Boilers

| Commercial Electric | Commercial Heat Pump | Commercial Gas | Commercial Oil Fired | Commercial Boilers | Crest Boilers | Wall Hung Commercial |

Water Treatment / Other

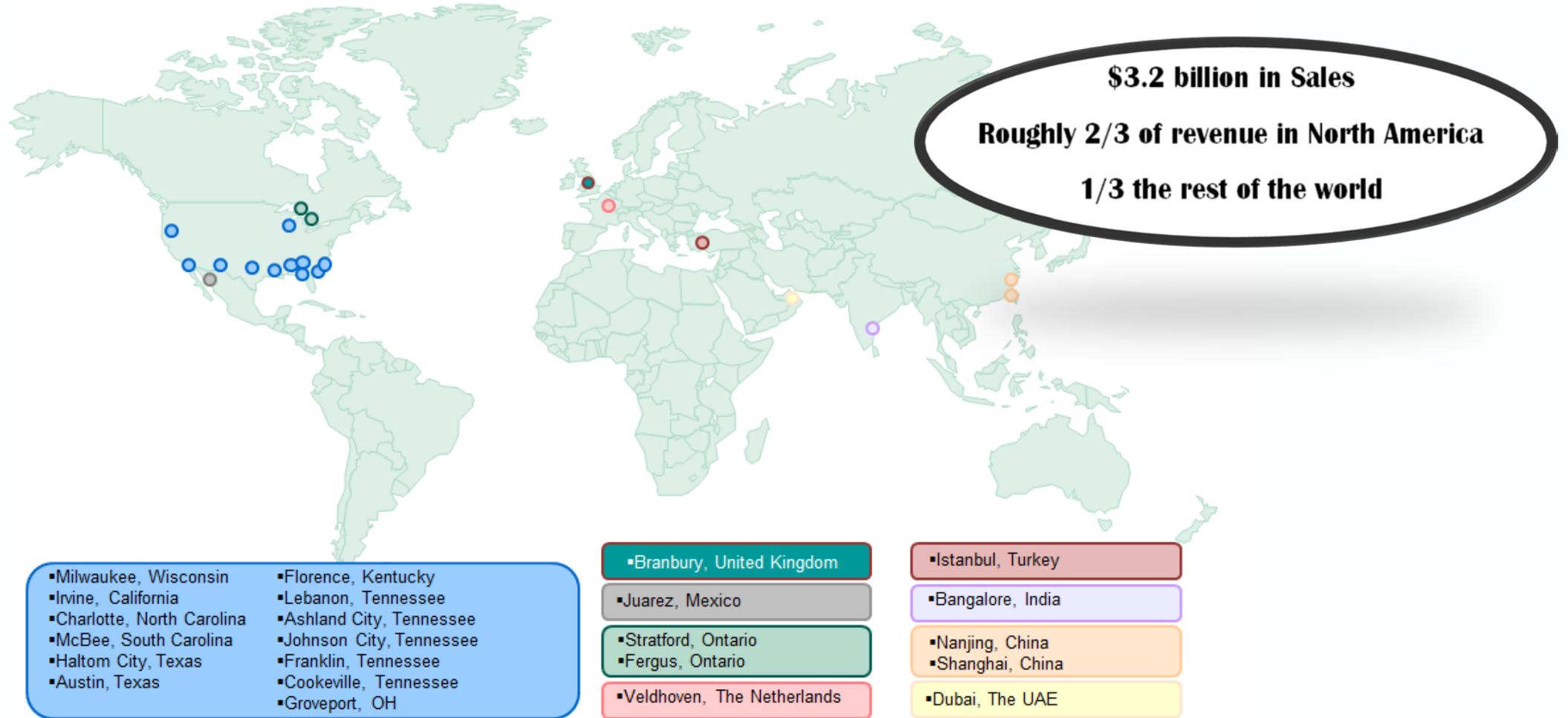| Residential Water Purifiers | Commercial Water Purifiers | Industrial Water Purifiers | Pump & Expansion Tanks | Water Filtration Products |

A. O. Smith Locations

$3.2 billion in Sales

Roughly 2/3 of revenue in North America

1/3 the rest of the world

- Milwaukee, Wisconsin
- Irvine, California
- Charlotte, North Carolina
- McBee, South Carolina
- Haltom City, Texas
- Austin, Texas
- Florence, Kentucky
- Lebanon, Tennessee
- Ashland City, Tennessee
- Johnson City, Tennessee
- Franklin, Tennessee
- Cookeville, Tennessee
- Groveport, OH

- Branbury, United Kingdom
- Juarez, Mexico
- Stratford, Ontario
- Fergus, Ontario
- Veldhoven, The Netherlands

- Istanbul, Turkey
- Bangalore, India
- Nanjing, China
- Shanghai, China
- Dubai, The UAE

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SAP ECC Migration

- Started 2013
- (13) North America Locations & (4) ERP's
- Long Blueprint & Build Phase
- Build Once… Rapid Succession Deployment
- Data Scrubbed & 'Commonized'
- Conversion Documentation Created

First Location Migrated

(Sean Gallup)

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What Happened?

➢ Missed Requirements

➢ Regulatory Changes: NAECA, FVIR

➢ Data Adjustments for Reporting

➢ Customer Portals

➢ Business Transformations & Acquisitions

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Main Data Issue

➢ SAP valid vs Business Valid

➢ Data Creation Using Copy Function

➢ Lack of Ownership

➢ No Governing Body

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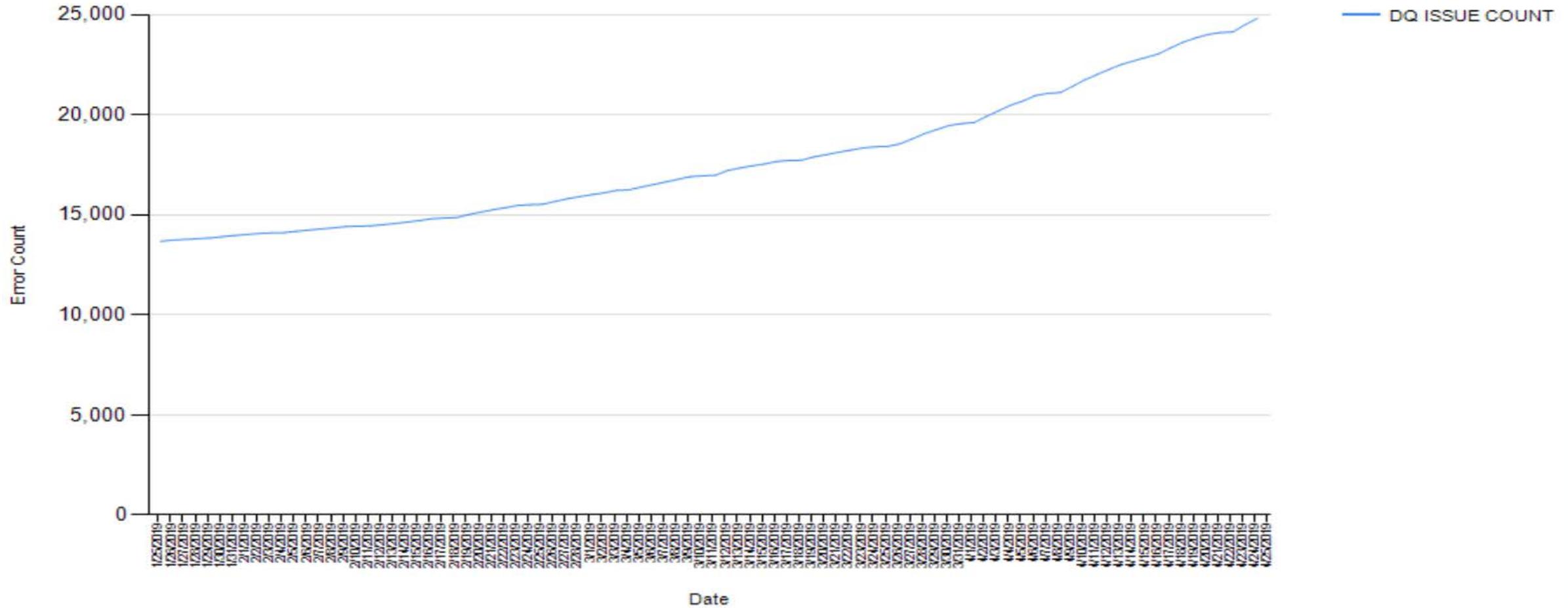# Data Quality Impact

Quality By Rule

Area	Table	Rule Count	Total Rules	Failed Rules	Percent Errors	Indicator
Customer		70	21,112,546	25,526	0.12%	🟢
	ADRC_CUST	22	6,706,876	75	0.001%	🟢
	KNA1	23	7,011,734	23,394	0.334%	🟢
	KNB1	8	2,533,080	1	0.000%	🟢
	KNVA	6	1,324,554	9	0.001%	🟢
	KNVV	11	3,536,302	2,047	0.058%	🟢
Material		150	74,264,310	1,522,192	2.05%	🟡
	MARA	53	12,490,669	972,653	7.787%	🟡
	MARC	54	23,352,732	254,019	1.088%	🟡
	MARD	8	16,184,824	12,653	0.078%	🟢
	MBEW	12	4,491,036	14,867	0.331%	🟢
	MLGN	2	368,368	2,191	0.595%	🟢
	MVKE	21	17,376,681	265,809	1.530%	🟡
Vendor		44	989,866	201	0.02%	🟢
	LFA1	30	444,510	143	0.032%	🟢
	LFB1	14	545,356	58	0.011%	🟢

Quality By Record

Area	Table	Records	Rows In Error	Percent Errors	Indicator
Customer		1,468,592	24,812	1.69%	🟡
	ADRC_CUST	304,858	70	0.023%	🟢
	KNA1	304,858	23,123	7.585%	🟡
	KNB1	316,635	1	0.000%	🟢
	KNVA	220,759	3	0.001%	🟢
	KNVV	321,482	1,615	0.502%	🟢
Material		3,959,663	163,347	4.13%	🟡
	MARA	235,673	61,961	26.291%	🔴
	MARC	432,458	59,652	13.794%	🔴
	MARD	1,923,514	10,366	0.539%	🟢
	MBEW	374,253	7,293	1.949%	🟡
	MLGN	184,184	1,597	0.867%	🟢
	MVKE	809,581	22,478	2.776%	🟡
Vendor		53,771	201	0.37%	🟢
	LFA1	14,817	143	0.965%	🟢
	LFB1	38,954	58	0.149%	🟢

Data Quality Impact

Data Quality Impact

Area	Table	Field	Field Description	Rule Name	Rule Description	Errors
Customer	KNA1	TELF1	First telephone number	KNA1_TELF1	If TELF1 <> ' ', if LAND1 in ('US','CA') then format must begin with 999-999-9999	23,035
Customer	KNVK_CUST	PAFKT	Contact person function	KNVK_PAFKT_Z1_CUST	If KNVK/KUNNR <> ' ', then PAFKT <> ' '; if NAMEV = 'AP' then PAFKT = 'Z5'; if NAMEV = 'Order' then PAFKT = 'Z1'; if NAMEV = 'Shipping' then PAFK5 = 'Z3'	6,433
Customer	KNVK_CUST	PAFKT	Contact person function	KNVK_PAFKT_Z3_CUST	If KNVK/KUNNR <> ' ', then PAFKT <> ' '; if NAMEV = 'AP' then PAFKT = 'Z5'; if NAMEV = 'Order' then PAFKT = 'Z1'; if NAMEV = 'Shipping' then PAFK5 = 'Z3'	5,286
Customer	KNVK_CUST	PAFKT	Contact person function	KNVK_PAFKT_Z5_CUST	If KNVK/KUNNR <> ' ', then PAFKT <> ' '; if NAMEV = 'AP' then PAFKT = 'Z5'; if NAMEV = 'Order' then PAFKT = 'Z1'; if NAMEV = 'Shipping' then PAFK5 = 'Z3'	3,801
Customer	KNVV	KTGRD	Account assignment group for this customer	KNVV_KTGRD_02	when (LAND1 = 'US' and VKORG = '1040') OR (LAND1 = 'CA' AND VKORG <> '1040') or (LAND1 not in ('US','CA')) and KTOKD in (Z001,Z003) then KDGRD = '02';	1,513
Customer	KNVK_CUST	NAME1	Name 1	KNVK_NAME1_CUST	If NAME1 <> ' ' then NAME1 must not contain numbers, comma(,) or period (.)	1,326
Customer	KNVV	VKBUR	Sales Office	KNVV_VKBUR	VKBUR <> ' ' and Customer Number (KUNNR) begins with 1 or 3	104
Customer	ADRC_CUST	DEFLT_COMM	Communication Method (Key) (Business Address Services)	ADRC_DEFLT_COMM_CUST	If KNVK-NAMEV = 'Statement' and KNVK-ABTNR = '0009', then this field must be 'INT'	73
Customer	KNA1	ORT02	District	KNA1_ORT02	If LAND1 = 'US' and KTOKD IN (Z001, Z002, Z003, ZIC) then ORT02 <> ' '	68
Customer	KNA1	STRAS	House number and street	KNA1_STRAS	If KTOKD not in ('Z003', '0012','Z999','0006') then STRAS <> ' '	52
Customer	KNVV	KTGRD	Account assignment group for this customer	KNVV_KTGRD_01	When (LAND1 = 'US' and VKORG <> '1040') OR (LAND1 = 'CA' and VKORG='1040' and KTOKD in (Z001,Z003) then KTGRD = '01';	28
Customer	KNA1	TXJCD	Tax Jurisdiction	KNA1_TXJCD	If KNA1/LAND1 in ('US','CA'):Â If KTOKD not in (0006, 0012, Z999) then TXJCD <> ' '	14
Customer	KNA1	PSTLZ	Postal Code	KNA1_PSTLZ	If KTOKD in (Z001, Z002, Z003, ZIC) then PSTLZ <> ' '	11
Customer	KNA1	TELFX	Fax Number	KNA1_TELFX	If TELFX <> ' ', if LAND1 in ('US','CA') then format must begin with 999-999-9999	9
Customer	KNVV	PRFRE	Relevant for price determination ID	KNVV_PRFRE	PRFRE <> ' ' and and Customer Number (KUNNR) begins with 1, 3, or 5	8
Customer	KNVV	BOKRE	Indicator: Customer Is Rebate-Relevant	KNVV_BOKRE	BOKRE <> ' ' and and Customer Number (KUNNR) begins with 1, 3, or 5	8
Customer	KNVV	INCO1	Incoterms (Part 1)	KNVV_INCO1	INCO1 <> ' ' and Customer Number (KUNNR) begins with 1	7
Customer	KNVV	INCO2	Incoterms (Part 2)	KNVV_INCO2	INCO2 <> ' ' and Customer Number (KUNNR) begins with 1	7
Customer	KNVV	ZTERM	Terms of Payment Key	KNVV_ZTERM	ZTERM <> ' ' and Customer Number (KUNNR) begins with 1 or 3	7
Customer	KNVV	VSBED	Shipping Conditions	KNVV_VSBED	VSBED <> ' ' and Customer Number (KUNNR) begins with 1 or 2	5
Customer	KNA1	PSTL2	P.O. Box Postal Code	KNA1_PSTL2	If PSTL2 > ' ', Then PSTL2<> PSTLZ	4

The Realization

➢ Need a way to enforce Business Rules.

➢ Request process manual and external to SAP

➢ Why Just Report Errors…

Provide the Means to Correct Records!

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Initial Solution

➢ Update ETL Tool to Latest Version

➢ Deploy Additional Modules

- Data Quality & Management

➢ Stewards Assigned to all Areas

➢ Build Governance Program

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Setbacks

➢ Platform not updated After (8) Months

➢ ETL Tool too Complex for Non-IT Staff

➢ Needed Dedicated Platform Staff

➢ Update required redeployment

Course Correction

➢ Moved Migration Activities to New Processes

➢ Began Reviewing Options for New Platform

➢ Engaged Vendors for Demos & POC on Vendor Master

➢ Realizing S/4HANA was on the horizon

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Partnered Solution

➢ Chose appMDM from Chain-Sys

➢ Build Solution for Vendor Master from POC

➢ Engaged Stewards for Data Quality Review

➢ Continued Discussion on MDM

appMDM™ Features – Data Quality Management

- appMDM's Data Quality Management comprises Data Consolidation, Data Standardization, and Data Harmonization activities.
- Consolidating the data into the Hubs is a critical activity. The system collects data from multiple source systems and sends it to target MDM Hubs to perform Consolidation, Profile and Assessment.
- Hadoop technology is extensively used.
- appMDM provides the "Matches", and the Data Stewards or the Data Owners can classify the matches as "False Positive" or "False Negative" and perform the merge, drop or migrate actions.

Data Collection → Data Profiling → Data Cleansing → Data Assessment → Data Enrichment → Move to Target
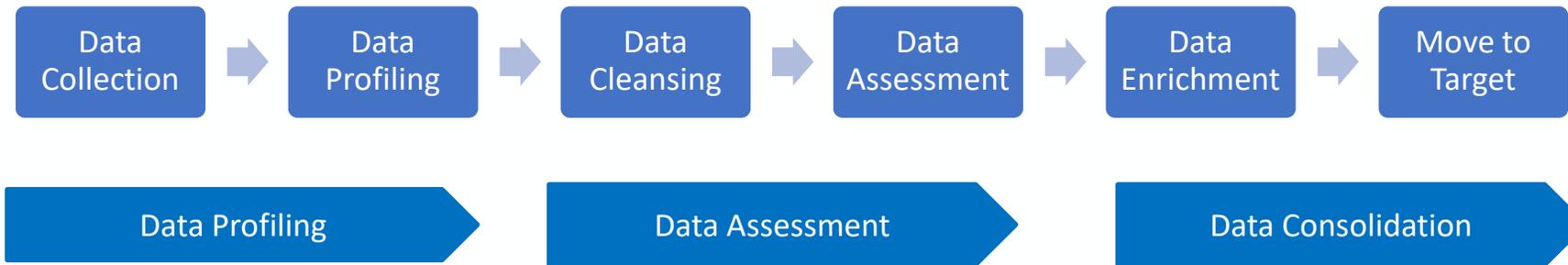
Data Profiling

Qualifying the Data

- Data Profiling is a systematic analysis of the content of a data source.

- Filtering the Source Data with Various rules

- Easy to know the source data which are extracted from the source system

Data Assessment

Analysis the Data

- Completeness Analysis

- Uniqueness Analysis

- Values Distribution Analysis

- Range Analysis

- Pattern Analysis

- *Complete information about the Quality of the source data*
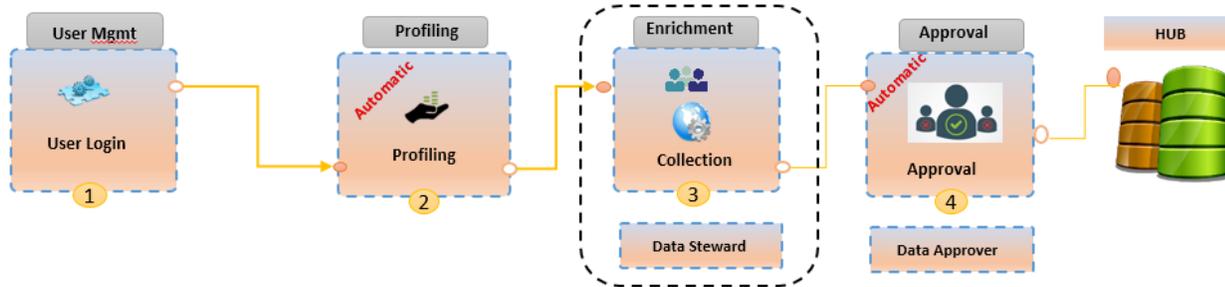
Data Consolidation

Error Consolidation

- Consolidation on bases of user defined Rules
- Real Time access to Consolidated Data.
- Consolidated Good Data can directly migrate to target.

- Edit distance Algorithm used

appMDM

Business Transaction

✓ appMDM Enrichment /Collection helps to enrich or complete the data based on the AO Business rules.
   ❖ Highlights with rules under which data has failed to meet AO business rule
   ❖ Helps user Identify which field requires attention for data enrichment / entry

Partnered Solution

➢ Data Quality Process (60+) Business Rules for Vendor Master

➢ Allows Steward to Correct Record, BAPI Validation occurs during Record Save and becomes a "single view of TRUTH"

➢ Change Written to SAP

➢ Calls User Exits for Vertex Tax, If Needed

Benefits

➢ Rules Applied as Data is Maintained

➢ Email Excel Form Used for Updates to be Moved to Workflow within appMDM

➢ New Vendor Creation Form

➢ Golden Record is maintained in appMDM

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Chain•Sys Platform™

ACCOUNTABILITY
When any of the guiding principles is violated, the error should be identified, attended to and resolved in a prompt manner by a monitored process with an auditable record of changes

ACCURACY
Information should be highly accurate with regards to regulatory and operational standards

CONSISTENCY
Information should be consistent wherever it is viewed throughout the enterprise. In addition, each customer, contract, customer site, supplier etc. should be uniquely identified

FLEXIBILITY
The data, metadata, policies and procedures for data quality should be continuously refreshed to remain consistent with the changing needs of the business

STANDARDS
The standards for the definition, usage, consistency and accuracy of data for each organization (Provider, Member, Claims, Marketing) that handles enterprise (master) or departmental data should be consistent with one another

TIMELY
Information should be accessible in the most timely manner in order to make timely decisions
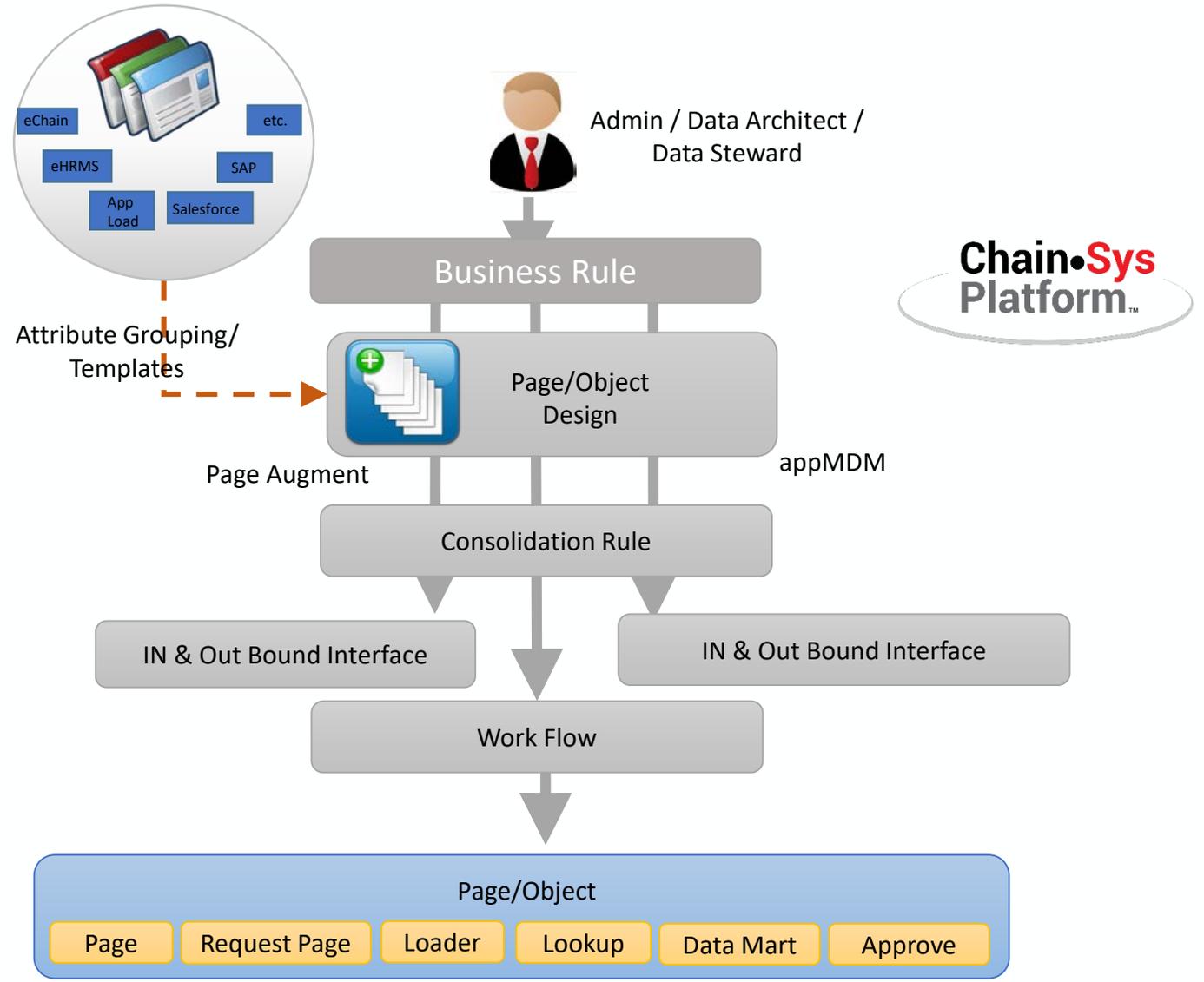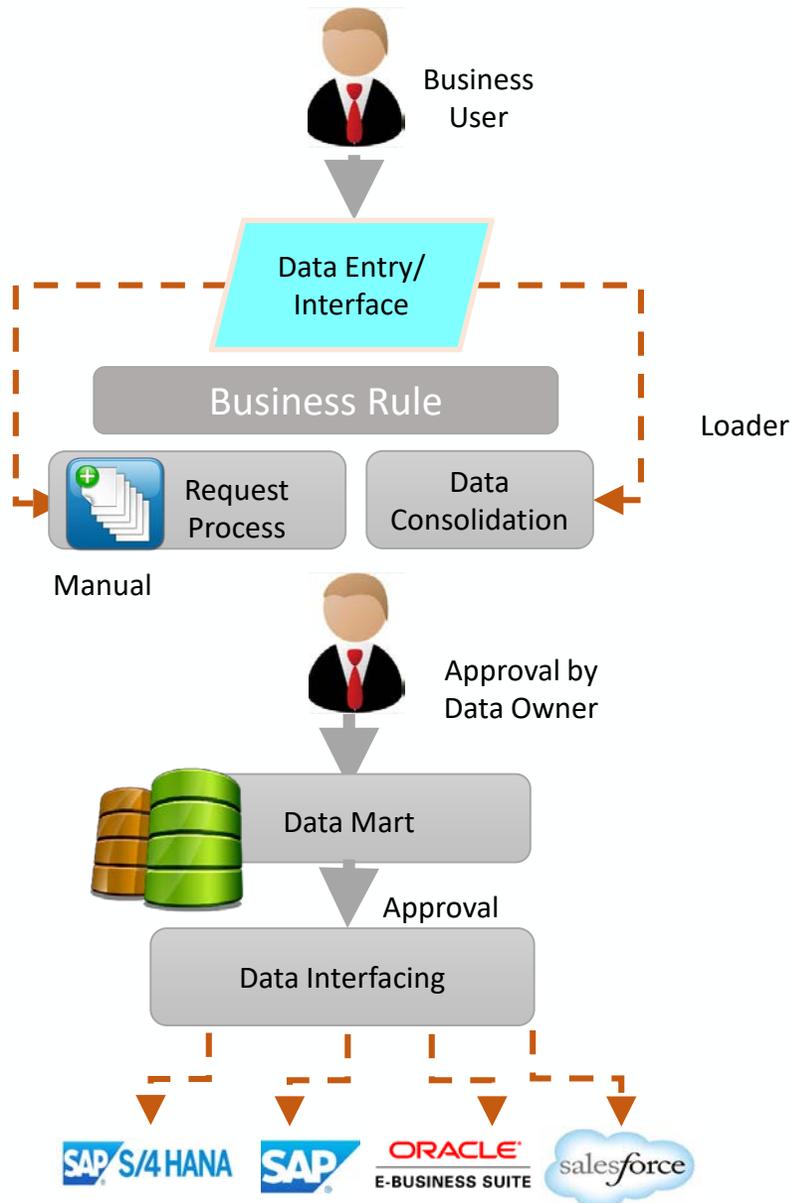
Indicators and Cleansing Rule Examples

Accounts
Account names based on Business Policies

Account Code
Account codes based on Business Policies

Cross Validation Rules
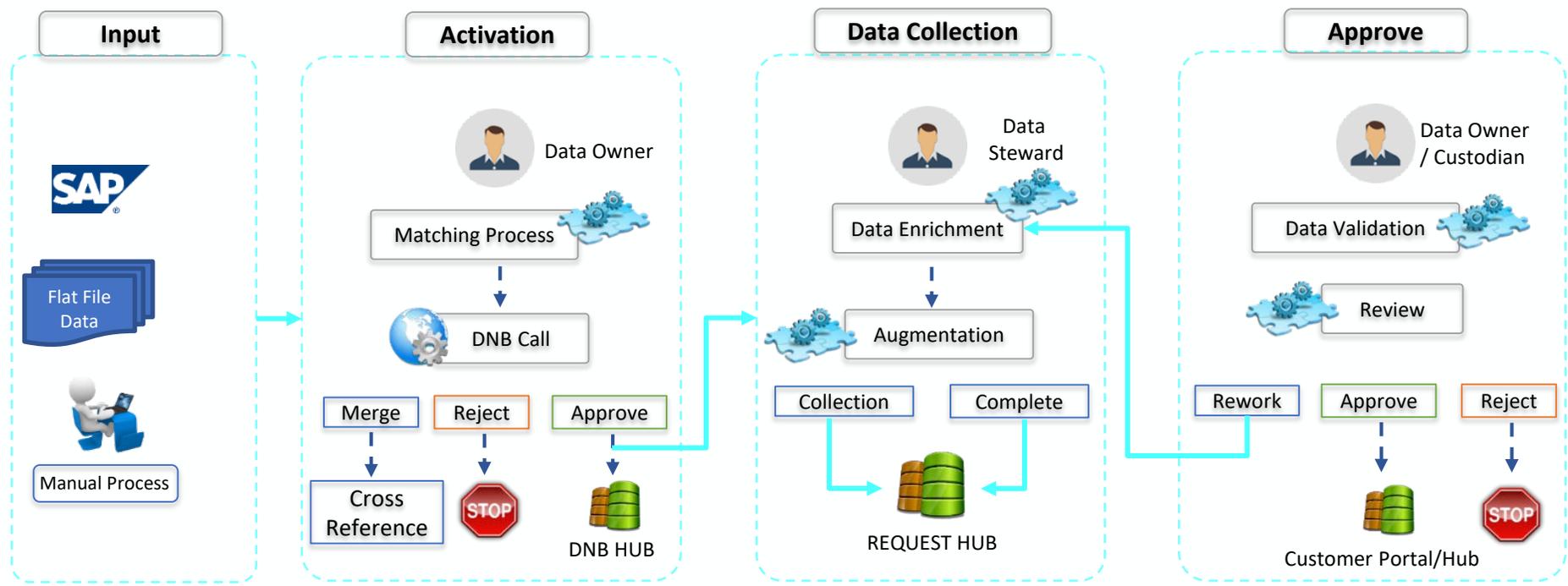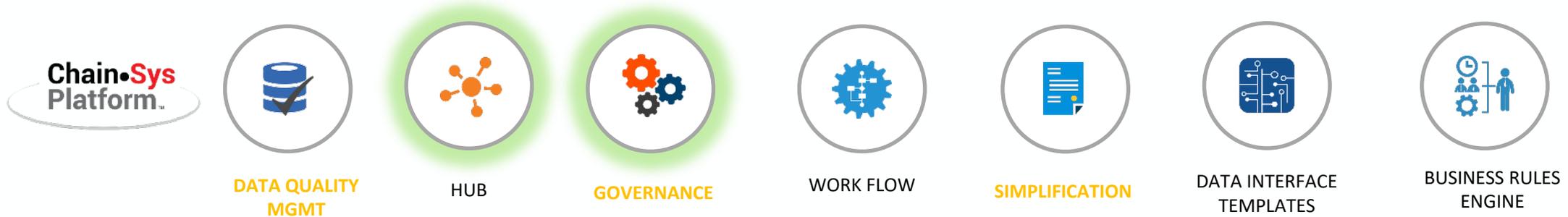Rules are based on Business Policies

Others

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Culture changes

➢ Not used to maintaining records outside of ERP

➢ (5) Separate Engineering Groups maintain materials.

   • Over 600 people have access

➢ Uses copy process that propagates errors

➢ Push work to where it originates

Sample workflow Diagram with Customized Business Rules

appMDM™ Process for Master Data Simplification, Governance & MDM

Chain•Sys Platform™

DATA QUALITY MGMT | HUB | **GOVERNANCE** | WORK FLOW | **SIMPLIFICATION** | DATA INTERFACE TEMPLATES | BUSINESS RULES ENGINE

Input

SAP
Flat File Data
Manual Process

Activation

Data Owner

Matching Process → DNB Call

Merge | Reject | Approve

Cross Reference | STOP | DNB HUB

Data Collection

Data Steward

Data Enrichment → Augmentation

Collection | Complete

REQUEST HUB

Approve

Data Owner / Custodian

Data Validation

Review

Rework | Approve | Reject

Customer Portal/Hub

Simplify the data governance process based on your needs

- Establish Data Governance Rules
- Restrict Data View
- Restrict Data Modification
- Governance Applicable for both Request & Master data Hub Screens
- Condition Based Action Logical Rules Engine

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Rollout Approach

➢ Attack from the Bottom - Up

  – Separate Productive from Non-Productive Materials with Different Stewards

  – Specific Data Areas (Sales Views, MRP Fields)

  – Plant Level (15+ Plants)

➢ Approach Engineering after Processes in Place

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2019 & 2020 Plan

➢ Customer Master moved to appMDM Maintenance & Creation

➢ Non-Productive Material (MRO) moved to appMDM for Maintenance & Creation

➢ Productive material moved to appMDM for Maintenance & Extension

➢ CAD Integration Creates Materials

2020 & Beyond

➢ Financial Updates & Workflow

➢ Transactional Data Monitoring

- Export Order to Check Export Tariff Assignments

- Validate Labeling Data against Bills of Material

➢ Create central data organization

Objectives before S/4 Hana migration

➢ Identify Stewards & Custodians for all Data Domains.

➢ Define Business Rules for Data Validation/Verification.

➢ Build workflow for Data Maintenance and Creation.

➢ Move Data Control to Central Data Group.

➢ Implement a MDM process.

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Presentation Materials

Access the slides from 2019 ASUG Annual Conference here:

http://info.asug.com/2019-ac-slides

Q&A

For questions after this session, contact us at mdees@aosmith.com and csclark@aosmith.com.

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