



Using Data Integration and Data Governance to Extend the Life of USMC Logistics Applications During Migration to GCSS-MC

System of Systems Engineering Collaborators Information Exchange (SoSECIE)



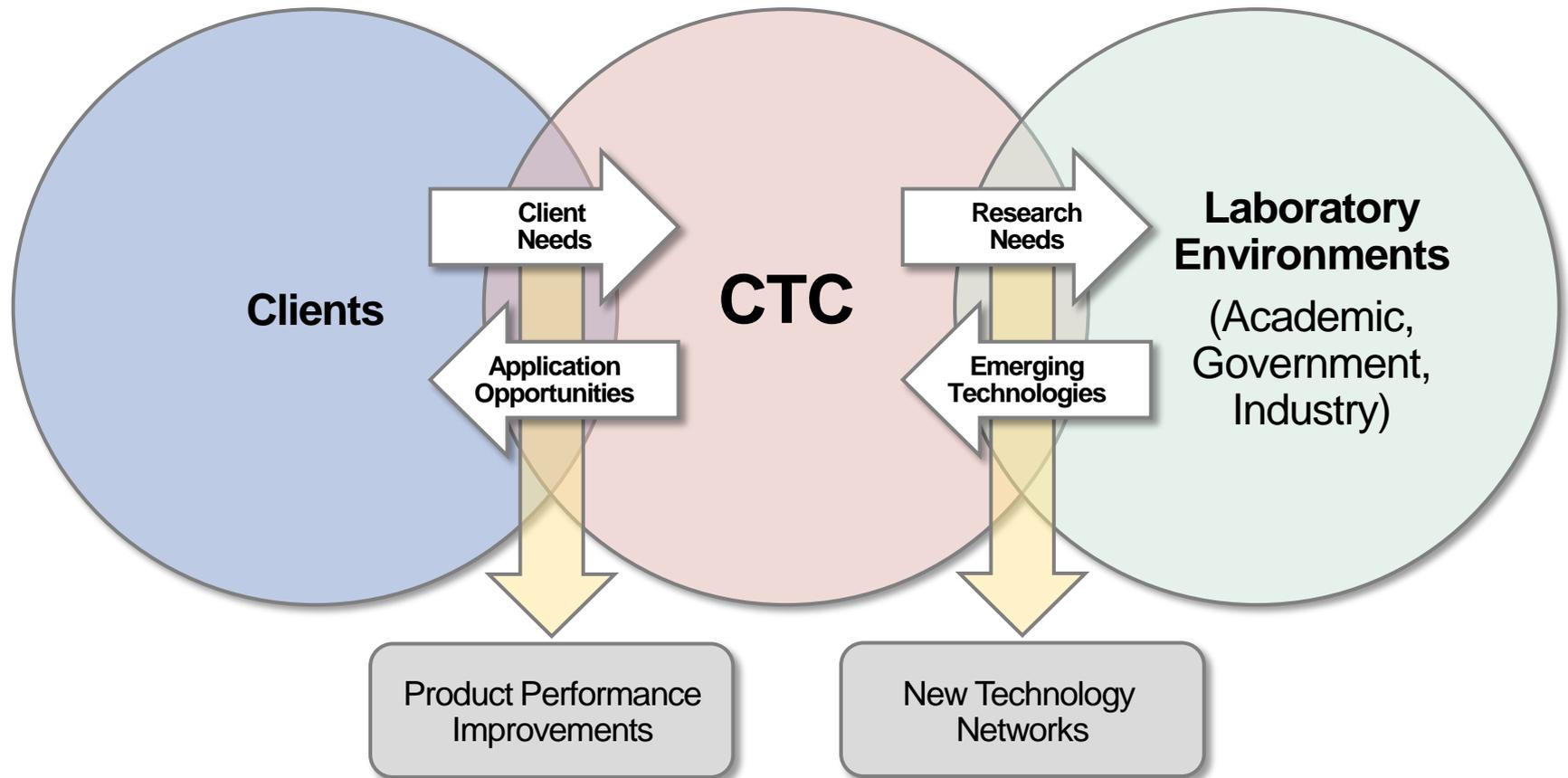
Mary D. Hiles



Concurrent Technologies Corporation

Who is CTC?

CTC is an independent, nonprofit, applied scientific research and development professional services organization.



What is the Problem?

- USMC needed to migrate legacy mainframe supply (SASSY) and maintenance (MIMMS) systems to the Oracle based GCSS-MC system in order to modernize and streamline its systems
- The migration period was planned in stages and the cutover would take more than 1 year as units were moved over in groups
- USMC still had the requirement to rollup their Readiness values at the USMC level and report to OSD
- Data Quality problems in the legacy system would further delay the migration

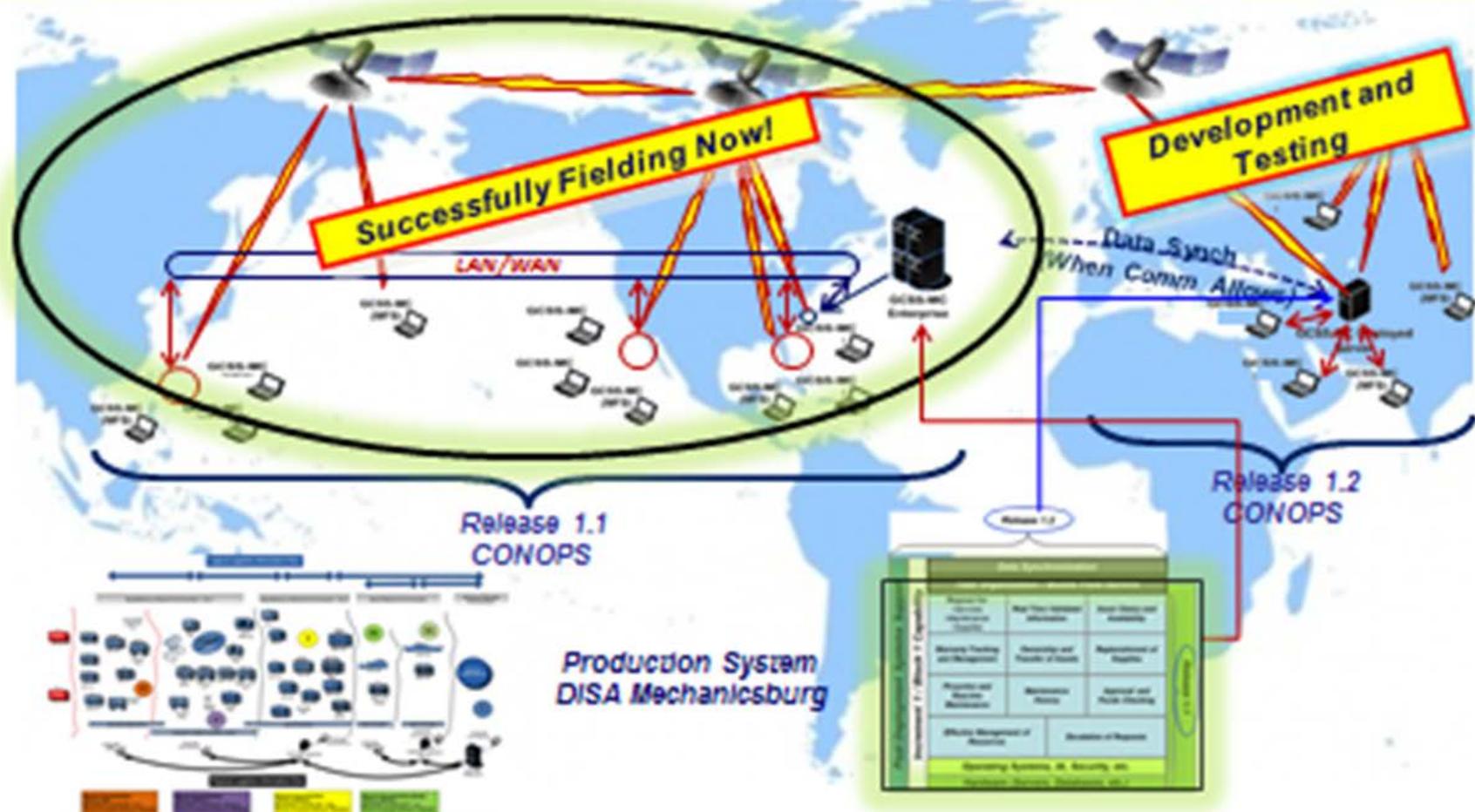
Requirements

- Need to have consistent, repeatable methods for reporting equipment readiness values during and after migration
- Need to help identify issues with the data and assist in cleansing the data prior to and during the migration
- Need to ease the transition to new system by managing reporting externally

GCSS-MC



- GCSS-MC is a multi-block program for Logistics Chain Management that will modernize the entire United States Marine Corps Logistics Architecture and Management across retail supply, wholesale supply, equipment maintenance, and repair functions.
- GCSS-MC will eliminate antiquated and unsupported hardware and software and retire Supported Activities Supply System (SASSY), Marine Corps Integrated Maintenance Management System (MIMMS), among others.
- Oracle is the Systems Integrator using the Oracle E-Business Suite 11i as the core software package.

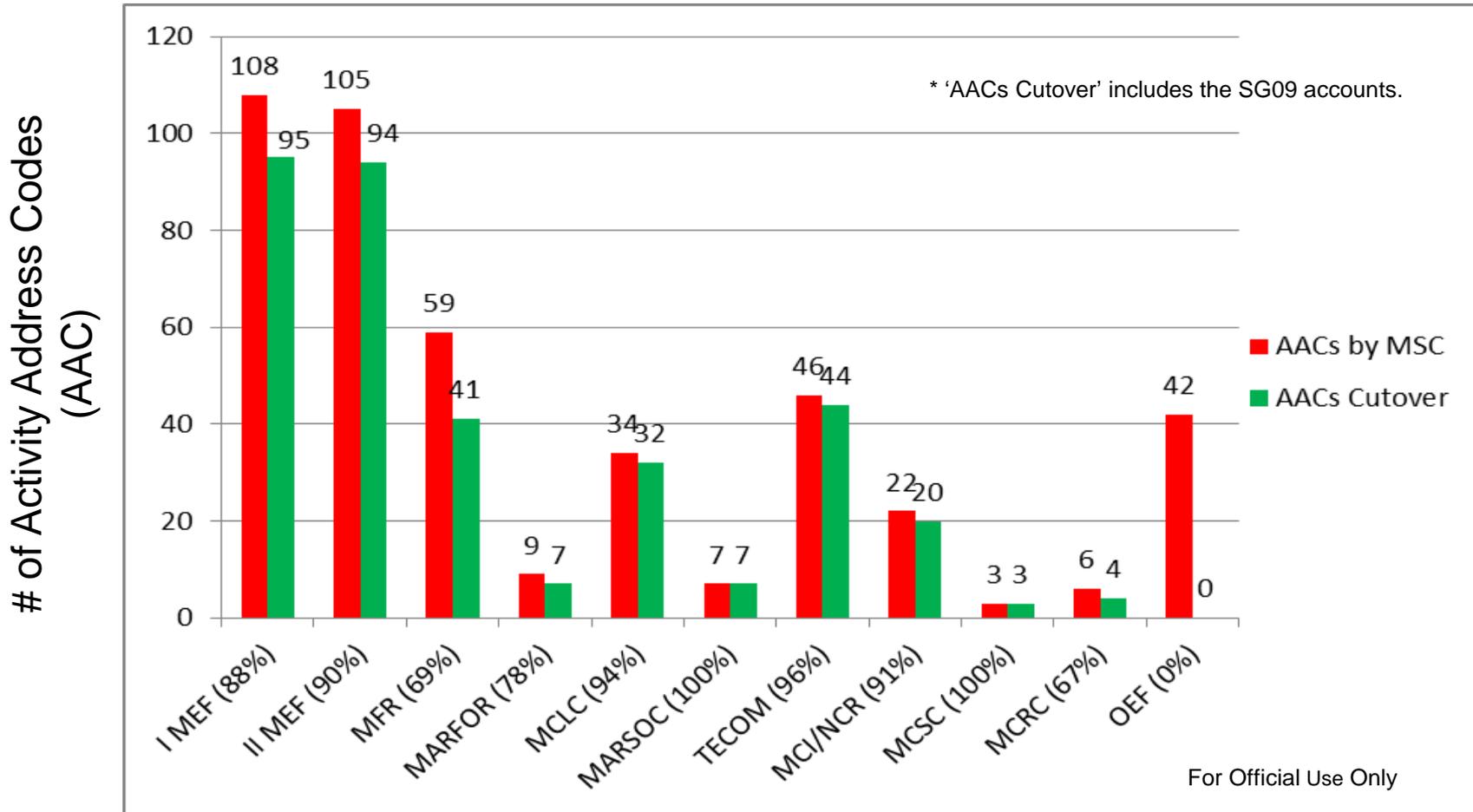


Replaces 40 year old legacy systems:
 MIMMS, SASSY, PC-MIMMS, & ATLASS

GCSS-MC Migration

- Migration was planned in stages beginning July, 2011 and running through December, 2012 for a majority of units
- There will still be pockets of units that do not cut over fully due to unique requirements, remote locations, etc...

CONUS Accounts Cutover by Accounts



All Major Commands are operating in GCSS-MC.

Approach

- Leverage the existing Data Warehouse to store the “blended” information from the legacy systems and GCSS-MC in the MDR during the transition period
- Enhance / Extend Total Life Cycle Management - Operational Support Tool (TLCM-OST) to create a system-independent Decision Support Tool
 - Provide a system-agnostic reporting environment that shields the user from having to know which Authoritative Data Source provided the information
 - Support Readiness Reporting
 - Support Discrepancy Reporting
 - Incorporate metrics and trends
 - Identify responsible organization and measurable values for deviation

TLCMOST

TOTAL LIFE CYCLE MANAGEMENT - OPERATIONAL SUPPORT TOOL

- is a Web-based decision support tool that:
 - Integrates usage, maintenance, and supply data
 - Provides one system for readiness visibility
 - Provides cost of maintenance data
 - Provides reliability, availability, and maintainability data
 - Facilitates trend analysis and decision formulation
 - Integrates earlier generations of targeted tools into a single decision support dashboard



Several of these tools won Defense Logistics Technology Implementation of the Year Award

TLCM-OST Home Page



Welcome: Brent Christie

TAMCN

Fleet Readiness Reporting

	Retail			Enterprise		
	S Rating	R Rating	MR Rating	S Rating	R Rating	MR Rating
USMC - USMC	87%	96%	85%	83%	86%	77%
MARFORPAC - M20020	85%	95%	82%	85%	95%	82%
I MEF - M19000	82%	95%	79%	82%	95%	79%
III MEF - M20120	87%	95%	85%	87%	95%	85%
MARFORCOM - M20000	86%	96%	84%	86%	96%	84%
II MEF - M20130	86%	96%	84%	86%	96%	84%
MARFORRES - M20015	63%	97%	62%	47%	96%	46%

Fleet Readiness

Other MARFOR Readiness

TFSD/LOGCOM Readiness

ENTERPRISE ASSET EMPLOYMENT

ENTERPRISE ASSET MANAGEMENT

ENTERPRISE ASSET FORECASTING

Financial

Supply

Maintenance

Transportation

Engineering

Health Services

Services

EQUIPMENT ACCOUNTABILITY TRENDING FOR USMC

PEI IDENTIFICATION DASHBOARD

ENTERPRISE LOGISTICS REPORTING DASHBOARD

My Applications

Favorite TAMCN's



Favorite TAMCN's



MARFORPAC



I MEF



III MEF



MARFORCOM



II MEF



MARFORRES



Identification

Requirements

Funding

Accountability

Sustainment

Disposals

Current Measures

A00907G

118

\$17,271,607.00

89

33

1

64%

79 / 16 / 23

\$194,063.00

77 / 11 / 1

11 / 8 / 14

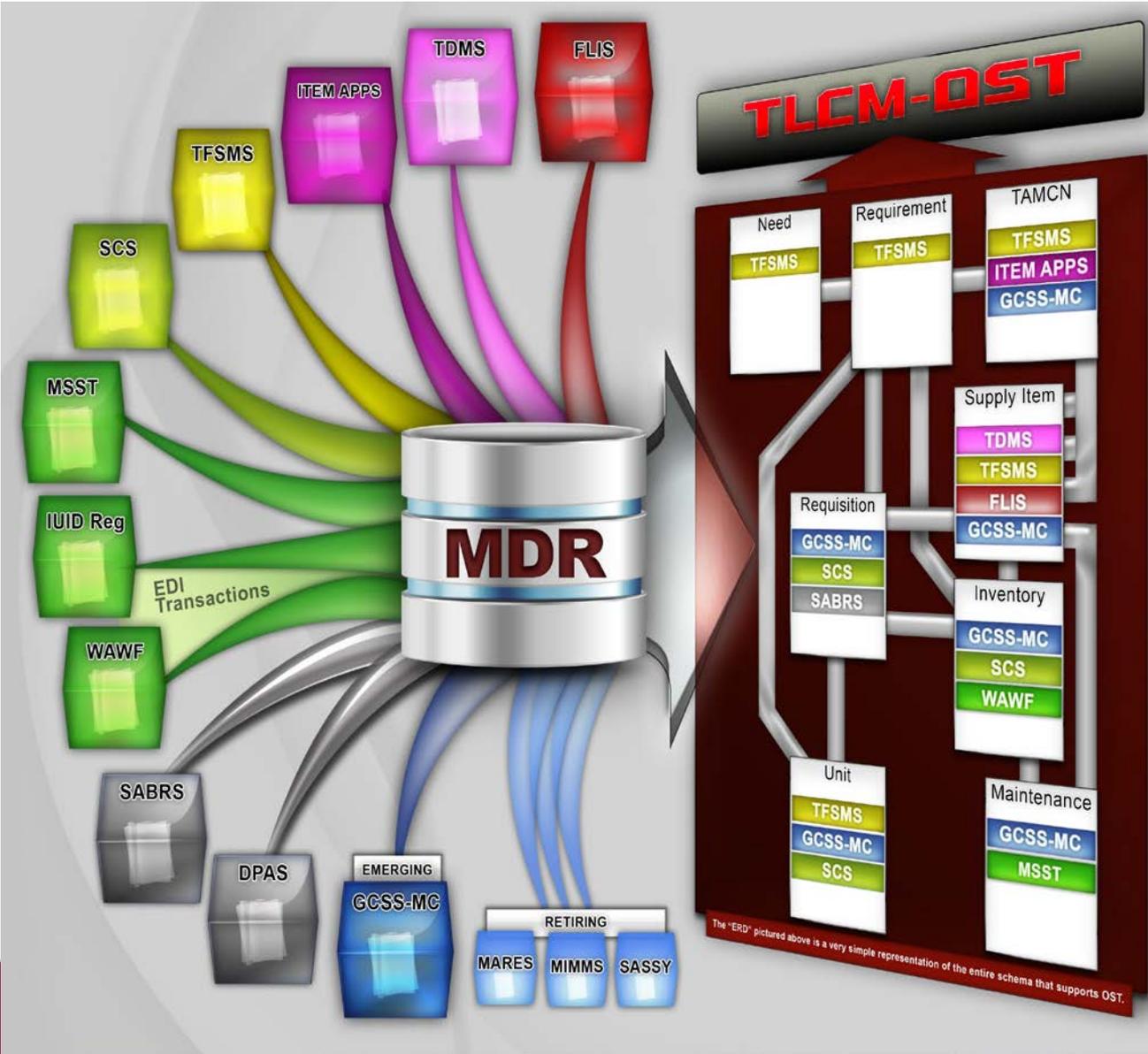
1

90% / 58%

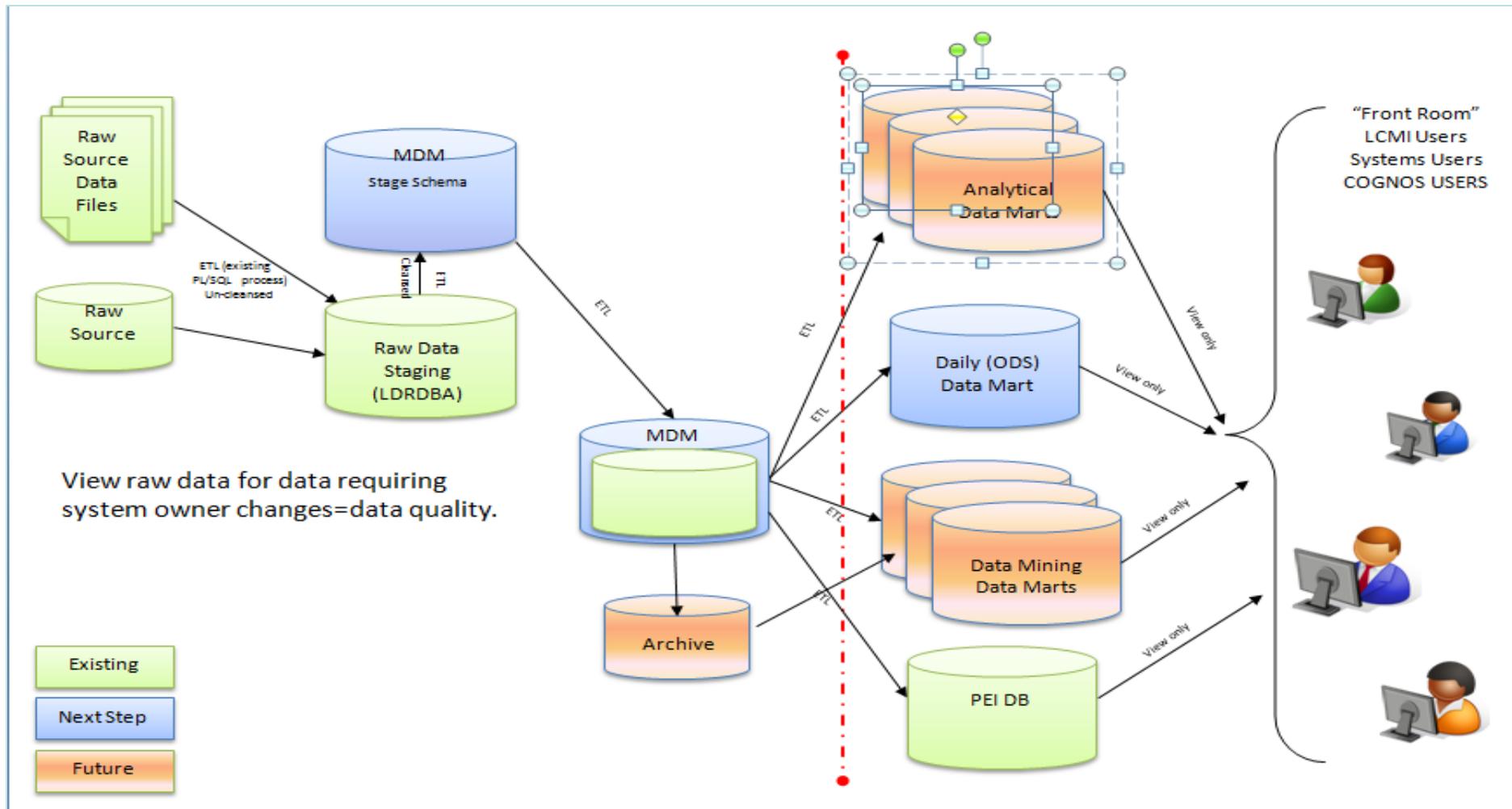
Out of Many – One Answer

MDR :

- Loads data from 31 source systems
- Supports 23 applications
- Has 8 exports to other systems
- 1.2 Terabytes of data
- Imports 164 datasets / ~53 million records daily.
- Stores data in “layers”, from raw source system data to functional layout to data marts



The Need for a Systems Engineering Approach



Blended Warehouse

Early Stage Migration

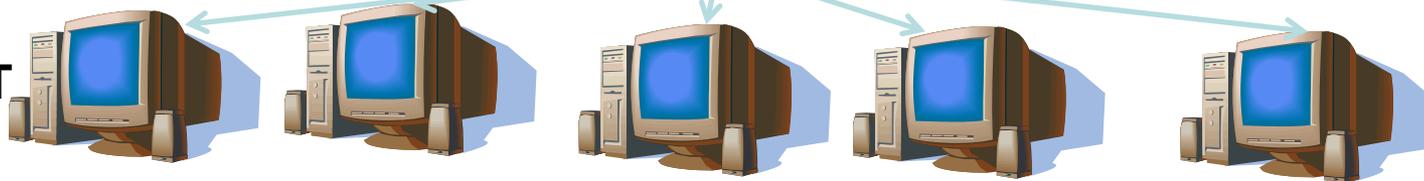


Late Stage Migration

Data Warehouse

Supply / Maintenance Data

TLCM-OST



No change to apps during migration

Approach

- Implement full complement of data quality reports and discrepancy reports prior to and during migration
- Apply Data Governance to Data Sources during migration
 - Define standard terminology and business rules
 - Communication of Business Rules / Calculations
 - Assign responsibility for Discrepancies
 - Provide Measurable metrics monthly – loop back to data owners
- Provide full disclosure of Data Pedigree throughout
 - Transparency of Source
 - Where did this piece of data come from?

Enterprise Logistics Reporting Dashboard

Welcome: Brent Christie
TAMCN Summary Search... Go

Home Enterprise Asset Pillars Enterprise Logistics Reporting Logistics Functional Areas

Enterprise Logistics Reporting Dashboard

Select a report below or use the navigation icons to the left to drill down to a selected report

Requirements

- AAO Validation Date Has Been Exceeded
- Item Exit Date Has Been Exceeded
- TFSMS AAO Not Equal to Supply Allowance

Small Arms Crane Reporting

- Small Arms Duplicate Serial Numbers
- Small Arms Serial Count Reconciliation
- Small Arms Crane Serial Numbers not Accounted for in USMC Systems
- Small Arms Serial Numbers Accounted for in USMC Systems but not Reported in Crane
- Small Arms Serial Numbers with AAC Mismatches between Crane and USMC
- Small Arms EA Trending (On Hand Qty vs. Serial Number Accuracy)
- Aged Small Arms in Transit
- Missing, Lost, Stolen or Recovered (MLSR)
- Small Arms Back Order Validation
- Small Arms Local Stock Numbers
- Crane AACs not listed in SASSY

Acquisitions

- TFSMS Planned Quantity with no MCPC defined
- On Hand is Greater than AAO
- Capability Alert - USMC Total OH Quantities Have Fallen Below 80% of the UTR
- Sustainment Alert - Enterprise Net Asset Posture Has Exceeded the UTR

Equipment Accountability Net Asset Posture

- EA Trending (On Hand Qty vs. Serial Number Accuracy)

Equipment Accountability Serial

Readiness Reporting

- LM2 Deadlines Greater than On Hand
- UICs that reported yesterday but did not report today
- Units Reporting the Same Item as Deadlined in MARES
- Duplicate MARES records
- Readiness Reportable Flag Discrepancies between MCBUL 3000 and TFSMS

Maintenance Production

- Duplicate EROs

TFSMS Hierarchy

Type Support Code Issues:

- AACs Found in SASSY (Crane) but not in TFSMS

PEI Identification

PEI Identification Dashboard

- IDN Mismatches - TFSMS vs IA
- TAMCN Mismatches - IA vs TFSMS
- IA NSN Issues - IA vs TDMS
- TFSMS NSN Issues - TFSMS vs TDMS

NSN

- TFSMS TAMCNs with no preferred NSN

Miscellaneous In Transit Visibility (ITV)

Welcome: Mary Hillis
TAMCN Summary Search... Go

Home Enterprise Asset Pillars Enterprise Logistics Reporting Logistics Functional Areas

Item Exit Date Has Been Exceeded

77 Click to drill in:

Program Office	Count
MCSC-PG-IWS	1
MCSC-PMM-092	3
MCSC-PMM-101	2
MCSC-PMM-111	1
MCSC-PMM-112	1
MCSC-PMM-113	1
MCSC-PMM-121	2
MCSC-PMM-122-CMS	12

Clear Filters Row Count: 77 of 77

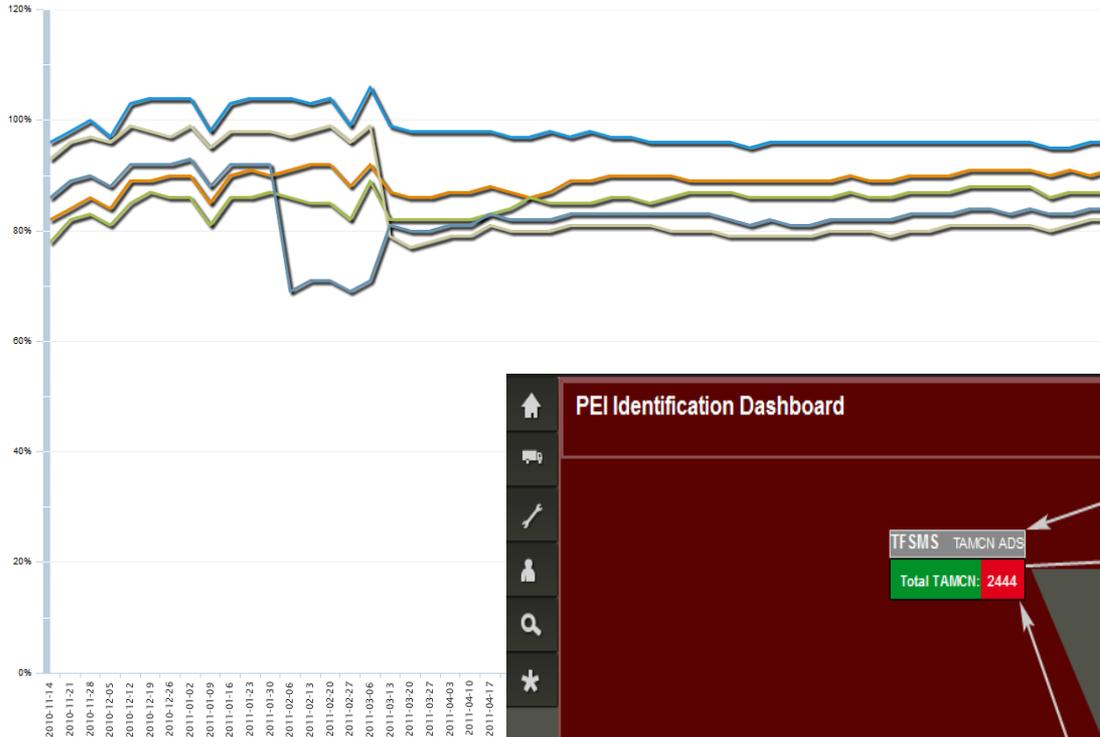
Product Group	Program Office	Integration Division	TAMCN	Nomenclature	TAMCN Status	NSN	ITM Designator	OH Qty	Item Apps Exit...	Item Apps Date Diff	TFSMS Exit Date	TFSMS Date Diff	Related TAMCN	Related OH Qty
L_PM	MCSC-PG-IWS	Fires and Man	A0049	ULTIMA 100MM	IS	12400153291		14			8/1/2006	2106		
L_PM	MCSC-PMM-L	Fires and Man	A0617	TEST SET, ELE	IS	66250137988	10262A	16	12/1/2015	-1303	10/1/2011	219		
L_PM	MCSC-PMM-L	Logistics Integ	E2810	TOOL KIT, FUL	IS	51800001832					12/1/1999	4541		
L_PM	MCSC-PMM-M	Logistics Integ	D0014	TRUCK, TRAC	IS	23200155203	11444A		5/1/2027	-5472	11/1/2010	553		
L_PM	MCSC-PMM-M	Logistics Integ	D1213	TRUCK, RTAA	IS	23200155354	11471A	0	10/1/2026	-5260	10/1/2010	584	D1212	68
PG-09	MCSC-PMM-0	Fires and Man	A0018	SURVEILLANC	IS	58550145822					12/1/2010	523		
PG-09	MCSC-PMM-0	Fires and Man	A0036	NIGHT SIGHT	IS	58550153146		7			12/1/2009	888		

Enterprise Asset Trending / PEI Iron Triangle

Data Pedigree
Help On This Page

EA Trending for USMC rollup (USMC)

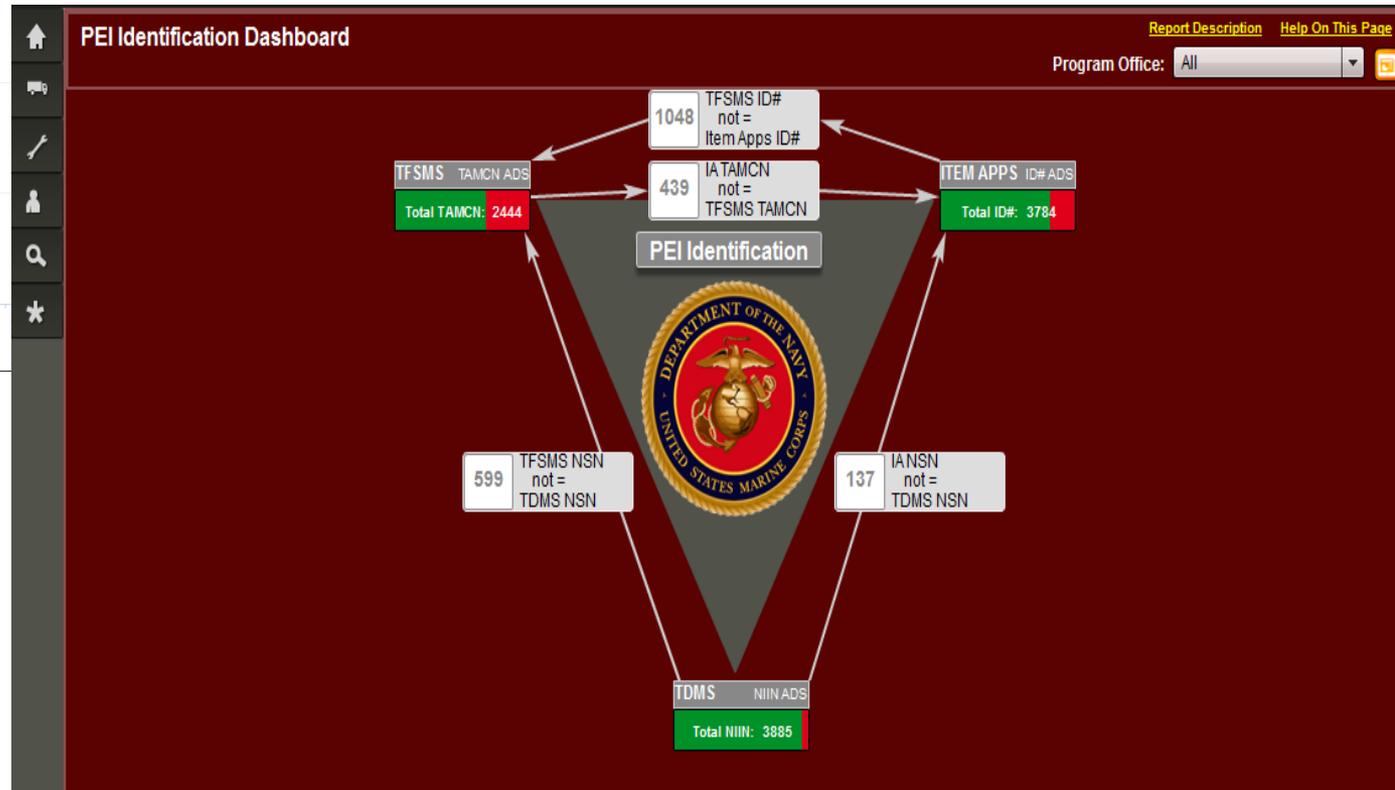
Export as:



Serial Count / On Hand, by Commodity Code

- A -- Type 1 Communications-Electronics
- B -- Type 1 Engineer
- D -- Type 1 Motor Transport
- E -- Type 1 Ordnance
- Total

Percentage	Description
= 100%	Serial Number Count = On Hand
> 100%	Serial Number Count > On Hand
< 100%	Serial Number Count < On Hand



Data Pedigree

Data Pedigree for TLCMOST.EAE Operation Status Details

Basic View		Detailed Tree View			
Data Element Title	Definition	Business Rules	USMC Data Source	MDR Table	MDR Column
UIC-Org (DODAAC)	Combination of UIC, Unit Name, and DODAAC	The DODAAC will be shown if TFSMS has the UIC/DODAAC association	TFSMS	TFSMS_UNIT	UNIT_NAME
TAMCN	Table of Authorized Material Control Number	A seven position alphanumeric control number assigned to an end	TFSMS	TFSMS_EQUIP	TAMCN
Nomenclature	The combination of approved item name and military type designation as	Refer to MIL-HDBK-1812	TFSMS	TFSMS_EQUIP	ITEM_NAME
Service Req/ERO	Count of Service Requests or Equipment Repair Orders (EROs) for the Maintenance Type shown	Maintenance type is determined by the category code (N, P, X or M) or in the case of Supply-Service the Job Status code (40 or 25)	MIMMS, GCSS-MC	GCSS_IB_ASSET_MAINT LDR_MIMMS_HIST_EROS LDR_MIMMS_HIST_EROS	EQUIP_REPAIR_ORDER_NUM DATE_CLOSED EQUIP_REPAIR_ORDER_NUM
EOM	Tells what Echelon of Maintenance is associated with the given Service Request/ERO	This will always reflect the highest EOM that is active for a given Serial Number.	MIMMS, GCSS-MC	GCSS_IB_ASSET_MAINT LDR_MIMMS_HIST_EROS	ECHELON_OF_MAINT ECHELON_OF_MAINT
BDI 2nd EOM	Battle Damage Indicator on the 2nd EOM Service Request/ERO per MCO	Per MCO, the BDI flag on the 2nd EOM is the flag that reflects the BDI status.	MIMMS	LDR_MIMMS_HIST_EROS	TYPE_LAST_PREV_MAINT
DCD	Deadline Control Date		MIMMS, GCSS-MC	GCSS_IB_ASSET_MAINT LDR_MIMMS_HIST_EROS	LM2_DATE DEADLINE_CONTROL_DATE
RDD	Requested Delivery Date		MIMMS	LDR_MIMMS_HIST_EROS	REQ_DELIVERY_DATE
Days Deadlined	Days Deadlined	Calculated as the number of days from Today minus Deadline Control Date (if still open) or Date Closed	MIMMS	LDR_MIMMS_HIST_EROS LDR_MIMMS_HIST_EROS	DATE_CLOSED DEADLINE_CONTROL_DATE

- Integrated an innovative Data Pedigree solution into its Software Development Lifecycle (SDLC) process at every data transformation step to capture the migration meta data
- The data was then chained together in both a basic and detailed tree view to allow the user to view field definition, source systems, and business rules at each step

Data Pedigree – Detailed Tree View

Basic View Detailed Tree View

- [-] TLCMOST, EAE Operation Status Details, UIC-Org (DODAAC)
- [-] TLCMOST, EAE Operation Status Details, TAMCN
- [-] TLCMOST, EAE Operation Status Details, Nomenclature
 - [-] ETLCMCOPDDBA, EAE_PKG.GET_SERVICE_DETAILS, NOMEN
 - [-] ETLCMCOPDDBA, TAMCN, NOMEN
 - [-] LDRDBA, TFSMS_EQUIP, ITEM_NAME
- [-] TLCMOST, EAE Operation Status Details, Service Req/ERO
- [-] TLCMOST, EAE Operation Status Details, EOM
- [-] TLCMOST, EAE Operation Status Details, BDI 2nd EOM
- [-] TLCMOST, EAE Operation Status Details, DCD
- [-] TLCMOST, EAE Operation Status Details, RDD
- [-] TLCMOST, EAE Operation Status Details, Days Deadlined
- [-] TLCMOST, EAE Operation Status Details, Serial Number
- [-] TLCMOST, EAE Operation Status Details, UII
- [-] TLCMOST, EAE Operation Status Details, Severity
- [-] TLCMOST, EAE Operation Status Details, Status Code
- [-] TLCMOST, EAE Operation Status Details, Days in Status
- [-] TLCMOST, EAE Operation Status Details, Parts on Order
- [-] TLCMOST, EAE Operation Status Details, Problem Code

Application:	LDRDBA
Table:	TFSMS_EQUIP
Column:	ITEM_NAME
Relation to parent action:	Copy
Relation to parent description:	First 200 characters
Application description:	Import area for LCMI data
Table short description:	
Table long description:	TFSMS_EQUIP - (TFSMS Equipment) - This table contains equipment table from TFSMS by TAMCN/NSN. This table is being replaced by TFSMS_TAM_CDTS, TFSMS_TAM_ACQ_POCS, TFSMS_TAM_ATTRIBUTES, TFSMS_TAM_CONTRACTS, TFSMS_TAM_CAGES, and TFSMS_CAR_RELATIONS.
Column short description:	
Column long description:	The name of an item that is approved for use by the Defense Logistics Service Center or that name selected by the requesting department or DOD agency by being consistent with federal cataloging policies.
Date Last Updated:	10/1/2012 Source Data As Of: 9/17/2012

Data Governance

- ▼ Folder TLCMOST, ELRD WSSP Tabular, PREF NSN
- ▼ Folder ETLCMCOPDDBA, GET_WSSP_TABULAR, NSN
- ▼ Folder ETLCMCOPDDBA, REP_WSSP_1_DET, NSN
- File LDRDBA, TFSMS_EQUIP, NATIONAL_STOCK_NUMBER

Data Pedigree

Exposes the lineage of a piece of data from it's initial source through to end application

Is the value shown in this particular field correct?

Data Quality

Does the number that is being shown for this field in relation to the other fields make sense?

Data Validation

TAMCN	TAMCN Status	AAO	MCBUL 3000 Reportable	Program Office	P
A0003	IS	557	N	MCSC-PMM-123	6
A0004		0	N	UNKNOWN	5
A0009	IS	347	N	MCSC-PMM-122-NET	5
A0010		0	N	UNKNOWN	
A0012	IS	2,745	N	MCSC-PMM-153	6
A0013	IS	14	Y	PEOLS-CAC2S	7
A0014	DP	0	N	MCSC-PMM-122-ADM	5

Supply

- ✔ Aged Small Arms in Transit
- ✔ Missing, Lost, Stolen or Recovered (MLSR)
- Small Arms Back Order Validation
- Small Arms Local Stock Numbers
- Crane AACs not listed in SASSY

Acquisitions

- TFSMS Planned Quantity with no MCPC defined

Lessons Learned / Next Steps

- Creating external reports/dashboard away from systems via data warehouse is a very affordable way to provide this capability and shield end users from migrations
- Need to treat Data Warehouse projects as Complex Systems Engineering problems
- Data Governance helps provide structure/responsibility
- Data Pedigree
 - “Ghost” Tables to track lineage of each data instance
 - Very time intensive to document Pedigree but valuable
- Historical data is kept forever so have to “get it right”
 - Have to maintain history and historical calculations as new orders are adopted to historical and current using same rules

Questions?

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