Meta
Advancing Mission Performance

An Integrated Platform for Mission Performance: GSFC's Meta Information System

Management Systems Branch
Safety and Mission Assurance Directorate
Goddard Space Flight Center

10/26/2016

Today's Topics

- Overview / Goals
- Process Performance
- System Design & Data / Information Management
- Analytics
- Challenges Ahead
- Discussion

Overview

- Meta information system project started in November 2012
  - In-depth study of legacy, stand-alone applications showed that capabilities for supporting process performance, data / information management and analytics not effective, integrated nor on par with best practices and state-of-the-market solutions
  - Commercial software licensed from Intelex for NASA use in February 2013
- Initial Meta applications deployed in May 2014 … and since then functionality / data / information from six legacy applications incorporated into an integrated system
- Now operating ten Meta applications … with more on the way!
- Steadily increasing user base (NASA civil servants, support contractors) with 1,196 current users
- Currently managing 6.8 gigabytes of data and 42,856 records
- Securely operated with 24/7 access on-site and remotely
- System planning, management and operation with process owners/stakeholders, users and a lean, dedicated team to provide end-to-end support
- Meta: short-hand reference to *metamorphosis* – process of transformation

Purpose / Goals

An integrated, state-of-the-market information system for process performance, data/information management, and analytics supporting the GSFC Management System, GSFC Supply Chain Management, NASA mission performance and the following goals:

- conformance of GSFC mission products and services with requirements on a sustainable basis;
- product and process improvements throughout the GSFC enterprise (i.e., GSFC organizations and mission project supply chains);
- informed decision-making; and,
- reduction of risks in GSFC mission performance.

Meta operates *smart* (controlled, streamlined, data-rich) processes

GSFC Supply Chain Management

Mission Performance
Spacecraft, Instruments, Ground Systems

= SMA (Code 300)
= FPD (Code 400)
= AETD (Code 500)
= Procurement (Code 210)

Outcomes
- Quality Products and Services
- On-Time Delivery at Acceptable Cost
- Innovative Problem-Solving / Continual Improvements
- Risk Reduction

Core Functions

Supplier Development
- Technology Investments
- Procurement Policy
- Small Business Programs
- Outreach

Acquisition / Team Building
- Acquisition Strategy
- Proposal Team Building
- Procurement (GSFC and contractor tiers)

Performance Management
- Project Management / Contract Oversight
- Mission Assurance Requirements
- Surveillance and Inspections
- Parts to System-level Testing

Assessment & Risk Management
- Project Lifecycle Reviews
- Supplier Assessments / Analyses
- GIDEP / NASA Alerts
- Risk Management

Information Systems for Process / Data Management and Informed Decision-Making

Applications

- Operational applications:
  - Management System Assessments
  - Supplier Quality Management Assessments
  - Process Findings (from the above and other internal sources)
  - Product Findings (Problem Reporting / Problem Failure Reporting)
  - Product Findings (Spacecraft On-orbit Anomaly Reporting)
  - Supplier Insight
  - SMA Risk Management
  - SMA Watchlist
  - Mission Projects
  - Meta Help Desk
- Additional applications on the way, including:
  - Product Inspection Tracking (pilot deployment)
  - GSFC Review Management (full deployment)
  - Integrated SMA Project Team (CSO) Reporting (definition / design)
  - Mission Products (definition)

NASA's Silver Achievement Medal

Presented at the 2016 Agency Honor Awards Ceremony @ GSFC

- Awarded to the Meta Team *"for revolutionizing how Goddard Space Flight Center manages information, modernizing legacy systems and providing cross-cutting data analysis capabilities for risk-informed decision-making."*
- The medal is awarded to "*teams by NASA Center Directors for a stellar achievement that supports one or more of NASA's Core Values."*

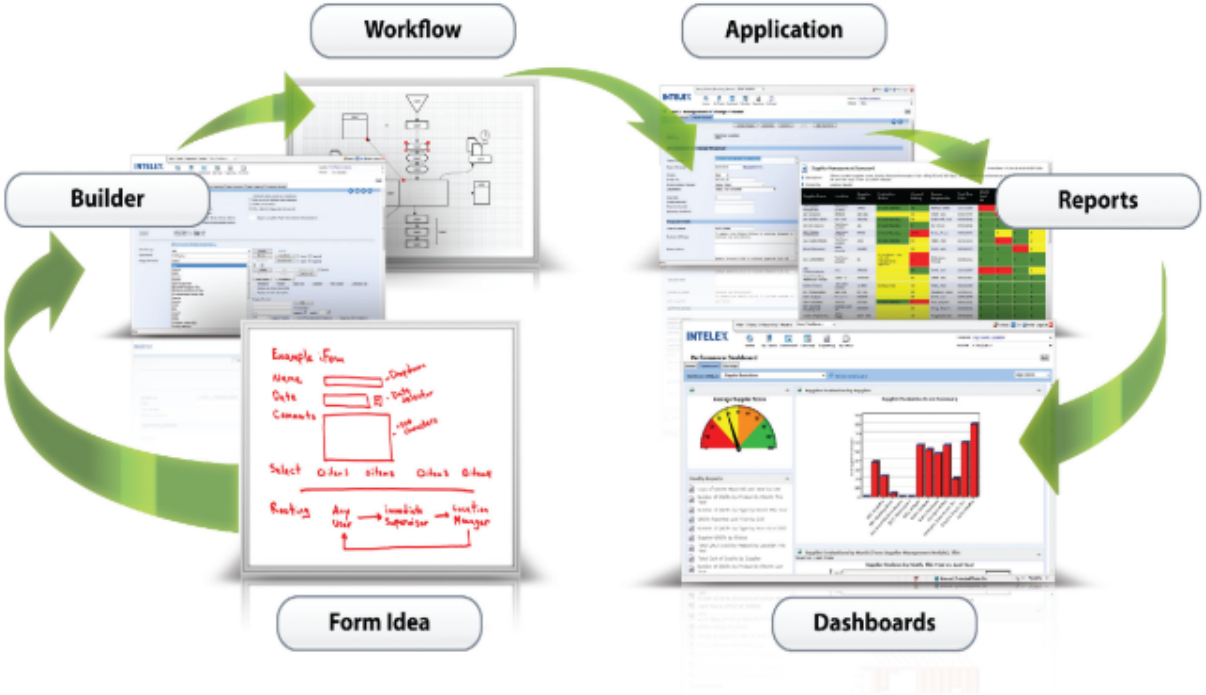
NASA Administrator Bolden speaking at the ceremony

The Medal

The Team (not all pictured)

Process Performance
Application Building & Upkeep

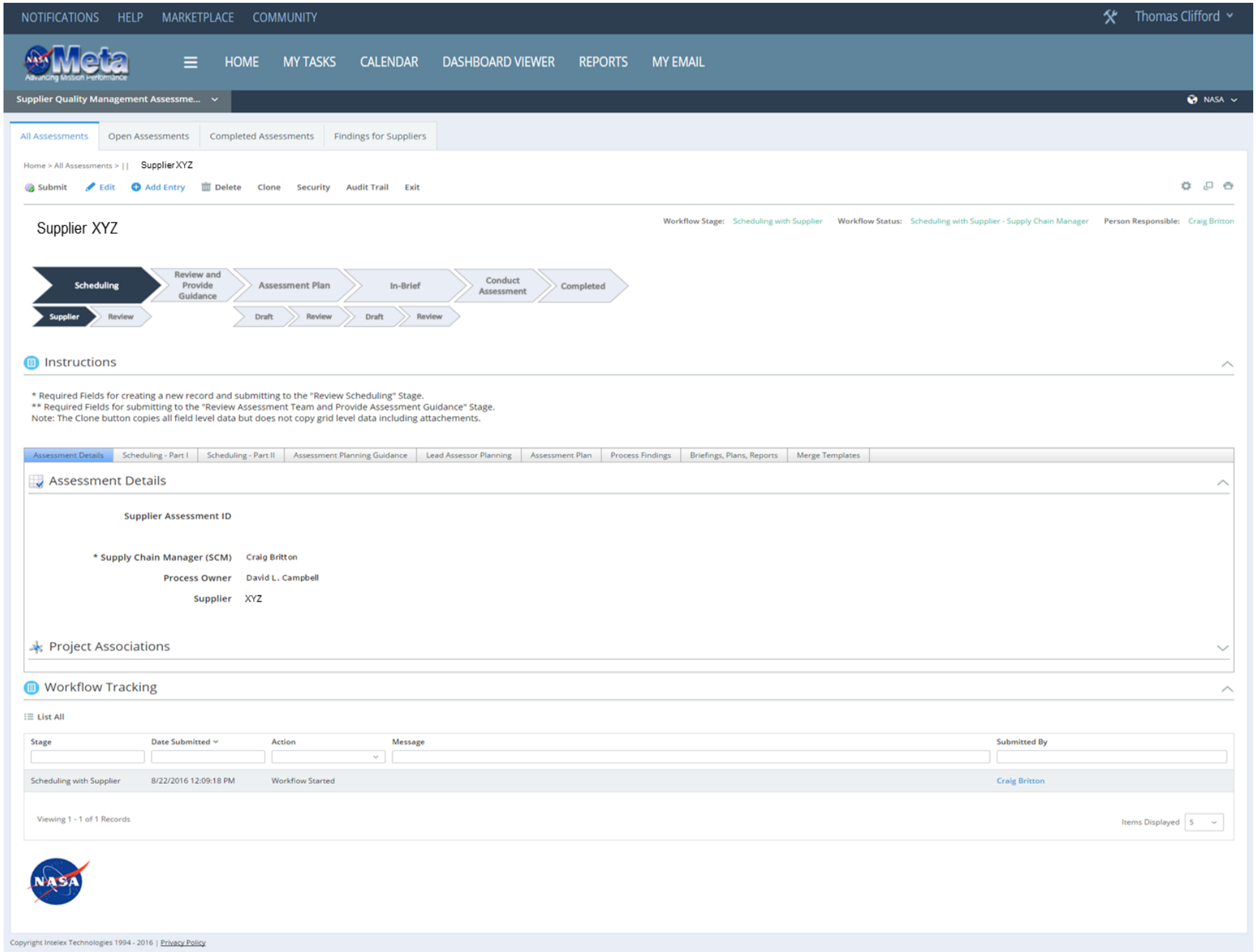
- Concept / Requirements Definition … including integration across applications and data linkages with other information systems
- Solution Design
- Configuration, Testing, Acceptance and User Training
- Operational Readiness and Deployment
- Post-Deployment User Assistance/Help Desk and Improvements



Success Factor: blending process knowledge and IT/software expertise to build and operate *smart* processes

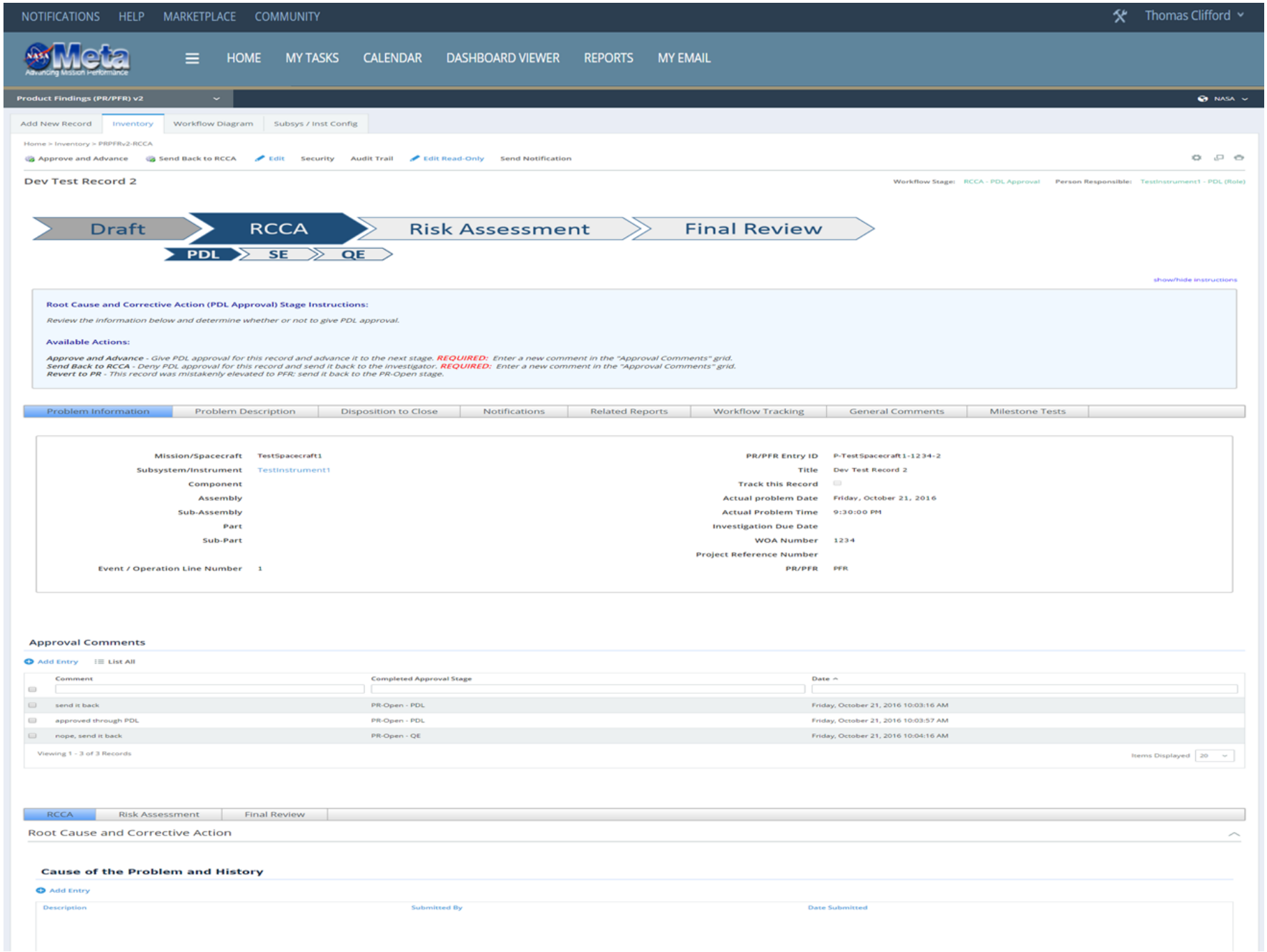
Process Performance

Supplier Quality Management Assessments



Process Performance

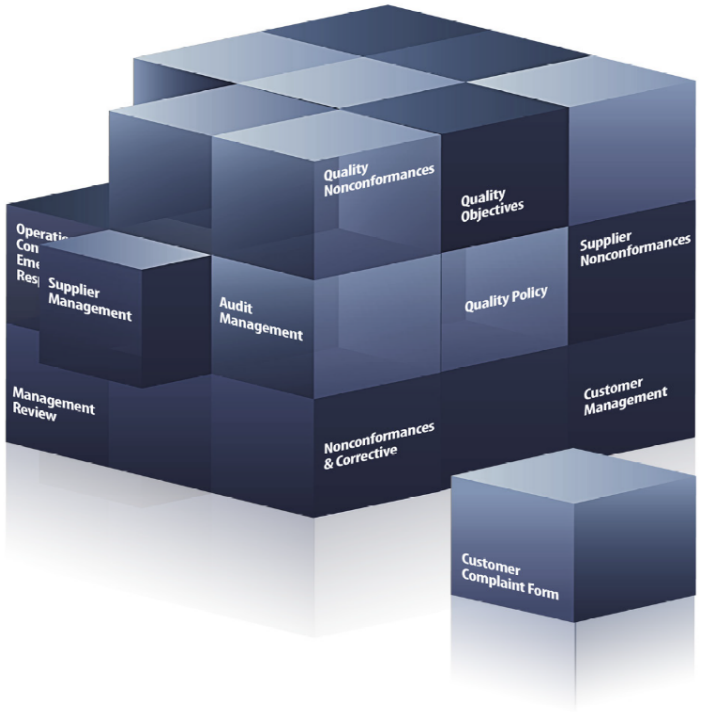
Problem Reporting / Problem Failure Reporting



System Design & Data/Information Management

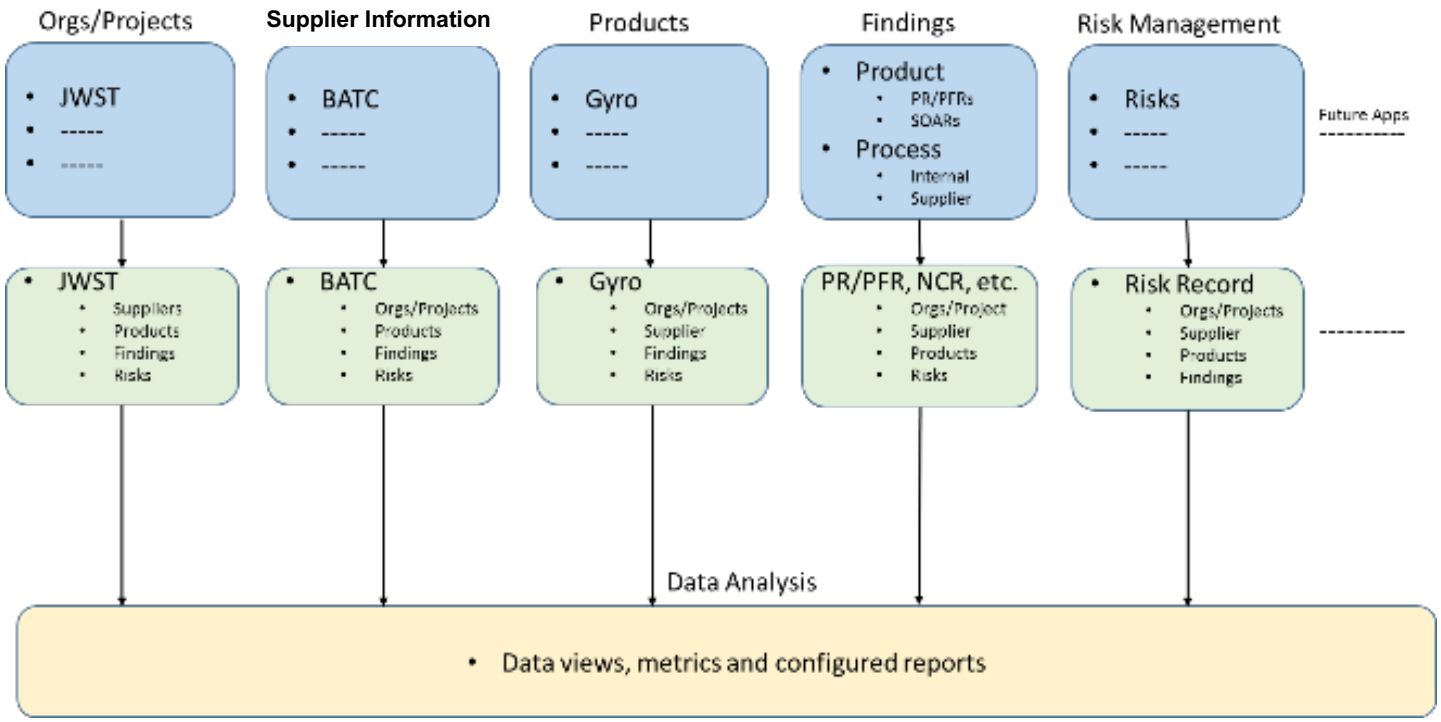
Silo Approach: traditional thinking +
+ fragmented IT/software solutions

Meta Approach: systems thinking +
integrated, scalable architecture +
configurable IT/software solutions



System Design & Data/Information Management

Meta Approach

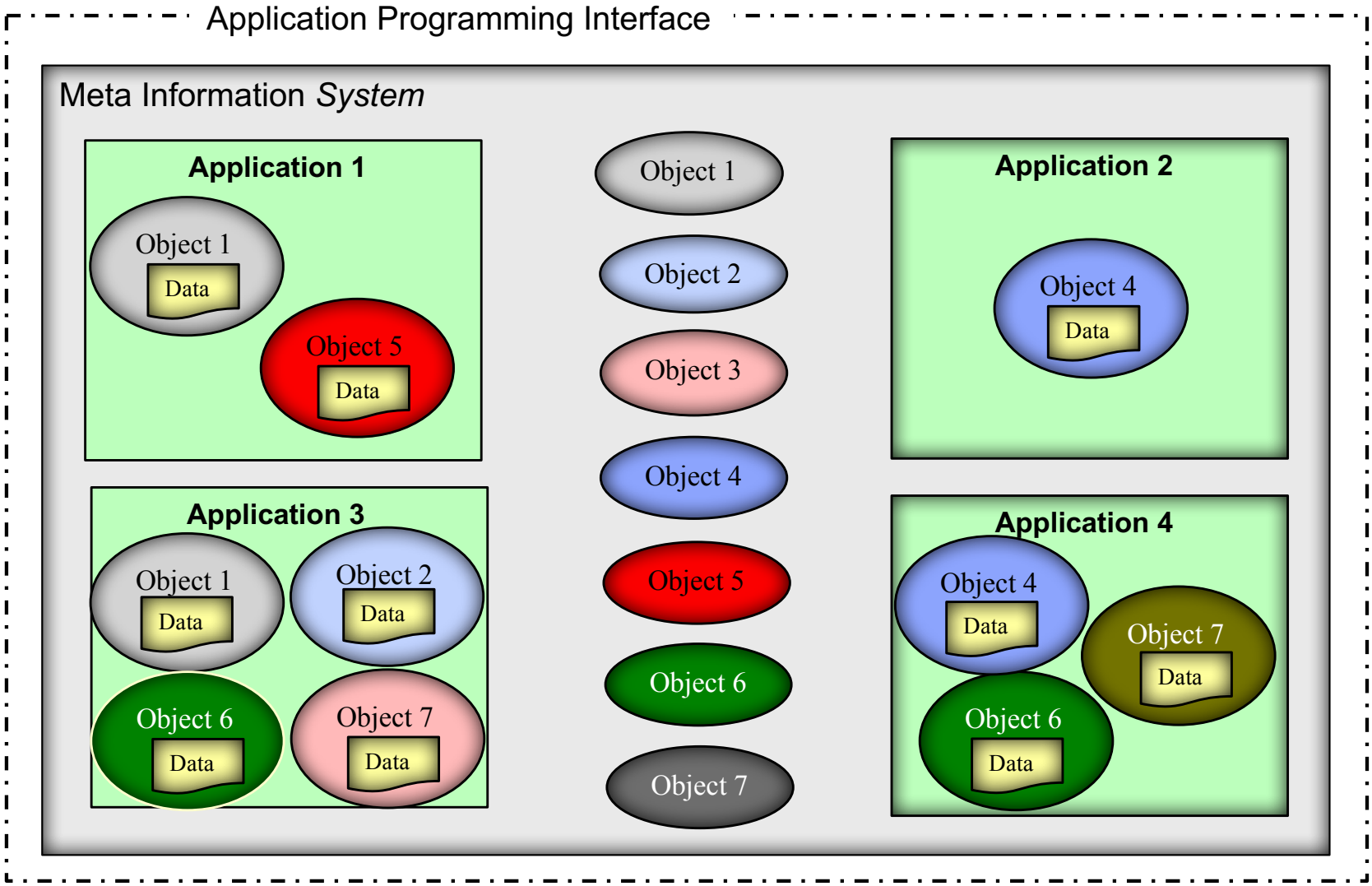


Meta selectively integrates data /information across applications (processes), creating synergistic value for users

Meta applications for smart processes

Support goals /desired outcomes

System Design & Data/Information Management
Meta Approach



Success Factor: systems thinking and enterprise knowledge combined with robust, object-oriented software to create an scalable platform for integrated process performance and data/information management

Data / Information Management

Audit Trail

Who, what, when, how……

Audit Trail.

	Audit	Audit Operation	Object Name	Database Operation	Operation Name	Audit Fields	Description	Field Name	Field Name	Old Value	New Value	Operation Name	Record ID
-	Audit: SupplManagement_SupplAssessmentObject												
	SupplManage...	Delete	SupplManage...	Update	Delete	ProcessFindings	SA-9U244-2016-1 || L-3 Communicatio... Telemetry and RF Products (formerly L-3 Telemetry-West) - San Diego, CA - CAGE: 9U244	ProcessFindings	ProcessFindings		Removed: Process Findings Process Findings	Delete	a60d212f-db06-4483-bee2-125e828c1ca9
	SupplManage...	View in Inventory	SupplManage...	Update	View in Inventory	InBriefUpload	SA-55864-2016-2 || ATK Space Systems, Inc. (Orbital ATK, Inc.) - Goleta, CA - CAGE: 55864	InBriefUpload	InBriefUpload		Added: ATK/Orbital In-Brief	View in Inventory	f356b27b-4571-43c1-b895-55feb536c33d
-	Audit: SupplManagement_SupplManagementObject												
	SupplManage...	Delete	SupplManage...	Update	Delete	Assessments	Metal Surfaces Inc (Bell Gardens, CA, USA)	Assessments	Assessments		Removed: SA-34916-2016-2 || Metal Surfaces Inc - Bell Gardens, CA - CAGE: 34916	Delete	0192d0c3-6705-4cae-8264-fef5fa5eede0
-	Audit: SupplManagement_NoWFAssessmenUpObject												
	SupplManage...	View in Inventory	SupplManage...	Create	View in Inventory	UploadedbyEm...	Moog Plan Rev B	UploadedbyEm...	UploadedbyEm...		olga.ceritelli@n...	View in Inventory	4b3fe76d-3f93-4877-b2ee-26a3b226eaa2
	SupplManage...	View in Inventory	SupplManage...	Create	View in Inventory	Description	Moog Plan Rev B	UploadedbyEm...	UploadedbyEm...		olga.ceritelli@n...	View in Inventory	4b3fe76d-3f93-4877-b2ee-26a3b226eaa2

Data / Information Management

Application Inventory, Filter/Search/Sort & Export

- **Filter/search with column text fields**
- **Advanced Search**
- **Quick sort (ascend/descent) on headings**
- **Export to xls file (Excel)**

Home | Suppliers | Assessments | Risk Analyses | More

Important Notice to Users

The Meta information system is a U.S. Government system to be used by authorized users only. It is managed by the Safety and Mission Assurance Directorate at the NASA Goddard Space Flight Center in compliance with NASA policy and procedural requirements for the protection of Sensitive But Unclassified (SBU) information, including information subject to the NASA Export Control Program in fulfillment of the U.S. Export Administration Regulations (EAR) and the International Traffic Arms Regulations (ITAR). Accordingly, information contained in the Meta information system may be Sensitive But Unclassified (SBU), subject to the NASA Export Control Program and to contractual requirements, and exempt from the Freedom of Information Act. Users entering or uploading such information into the Meta information system should assure that it is designated or marked in accordance with NASA procedural requirements. Information obtained from the Meta information system should be protected as required by NASA procedural and contractual requirements. Users are advised to exercise sound judgment in handling information obtained from the Meta information system. Even when data, records or files contained within the Meta information system have not been specifically designated or marked as SBU, but nonetheless may contain sensitive information, public disclosure should be avoided. Questions concerning sensitive information should be directed to the NASA employee(s) responsible for the information and to the Meta Help Desk (email: gsfc-metahelp@mail.nasa.gov, phone: 301-286-9177).

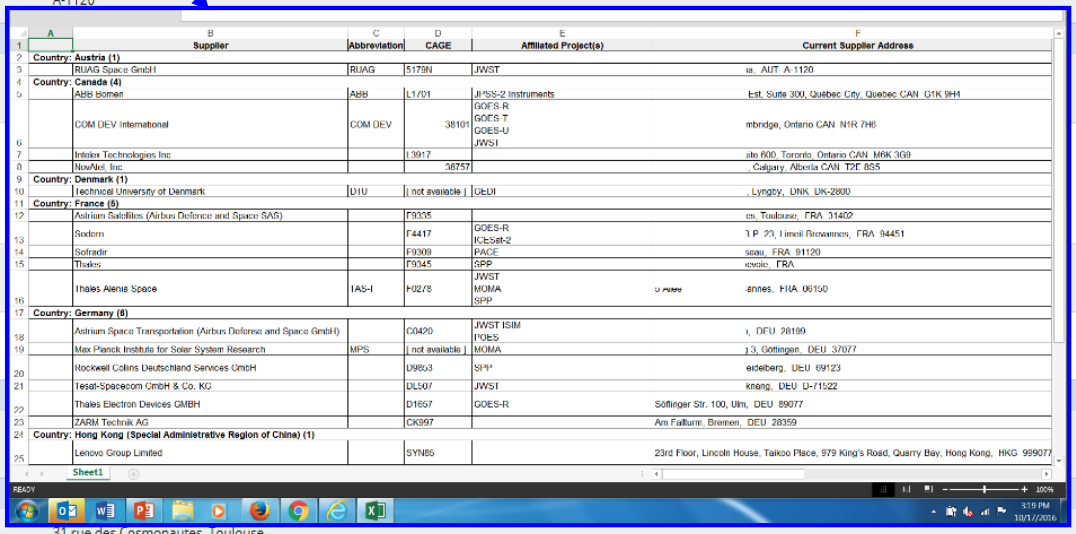
References: NPR 2810.1A, Security of Information Technology; NPR 1600.1A, NASA Security Program Procedural Requirements; NID 1600.54, Safeguarding Sensitive But Unclassified Information; NID 1600.55, Sensitive But Unclassified (SBU) Controlled Information; NPR 2190.1B, NASA Export Control Program

Home > Suppliers

Custom Inventory

Add New Supplier | Archive | Delete | List All | Advanced Search | Hierarchy Tree | Data Import | Actions

Supplier	Abbreviation	CAGE	Affiliated Project(s)	Current Supplier Address	North American Industry Classification (NAICS)	Supplier No.
Country: Austria (1)						
RUAG Space GmbH	RUAG	5179N	• JWST	Stachegasse 16, Vienna, AUT A-1120	Satellite Telecommunications	SI-0201
Country: Canada (4)						
ABB Bomen	ABB	L1701	• JPSS-2 Instruments			
COM DEV International	COM DEV	38101	• GOES-R • GOES-T • GOES-U • JWST			
Intelex Technologies Inc.		L3917				
NovAtel, Inc.		38757				
Country: Denmark (1)						
Technical University of Denmark	DTU	[not available]	• GEDI			
Country: France (5)						
Astrium Satellites (Airbus Defence and Space SAS)		F9335		31 rue des Cosmonautes, Toulouse, FRA 31402		SI-0150



Supplier	Abbreviation	CAGE	Affiliated Project(s)	Current Supplier Address
Country: Austria (1)				
RUAG Space GmbH	RUAG	5179N	JWST	ia, AUT A-1120
Country: Canada (4)				
ABB Bomen	ABB	L1701	JPSS-2 Instruments	Est, Suite 300, Québec City, Québec CAN G1K 9H4
COM DEV International	COM DEV	38101	GOES-R GOES-T GOES-U JWST	mbridge, Ontario CAN N1R 7H6
Intelex Technologies Inc		L3917		ate 600, Toronto, Ontario CAN M6K 3G9
NovAtel, Inc		38757		, Calgary, Alberta CAN T2E 8S5
Country: Denmark (1)				
Technical University of Denmark	DTU	[not available]	GEDI	, Lyngby, DNK DK-2800
Country: France (5)				
Astrium Satellites (Airbus Defence and Space SAS)		F9335		es, Toulouse, FRA 31402
Sodern		F4417	GOES-R ICESat-2	3 P. 23, Limeil Brevannes, FRA 94451
Sofradir		F9309	PACE	seau, FRA 91120
Thales		F9345	SPP	exelle, FRA
Thales Alenia Space	TAS-I	F0278	JWST MOMA SPP	annes, FRA 06150
Country: Germany (8)				
Astrium Space Transportation (Airbus Defense and Space GmbH)		C0420	JWST ISIM POES	, DEU 28199
Max Planck Institute for Solar System Research	MPS	[not available]	MOMA	g 3, Gottingen, DEU 37077
Rockwell Collins Deutschland Services GmbH		D9853	SPP	eidelberg, DEU 69123
Tesat-Spacecom GmbH & Co. KG		DL507	JWST	kneng, DEU D-71522
Thales Electron Devices GMBH		D1657	GOES-R	Söflinger Str. 100, Ulm, DEU 89077
ZARM Technik AG		CK997		Am Fallturm, Bremen, DEU 28359
Country: Hong Kong (Special Administrative Region of China) (1)				
Lenovo Group Limited		SYN85		23rd Floor, Lincoln House, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong, HKG 999077

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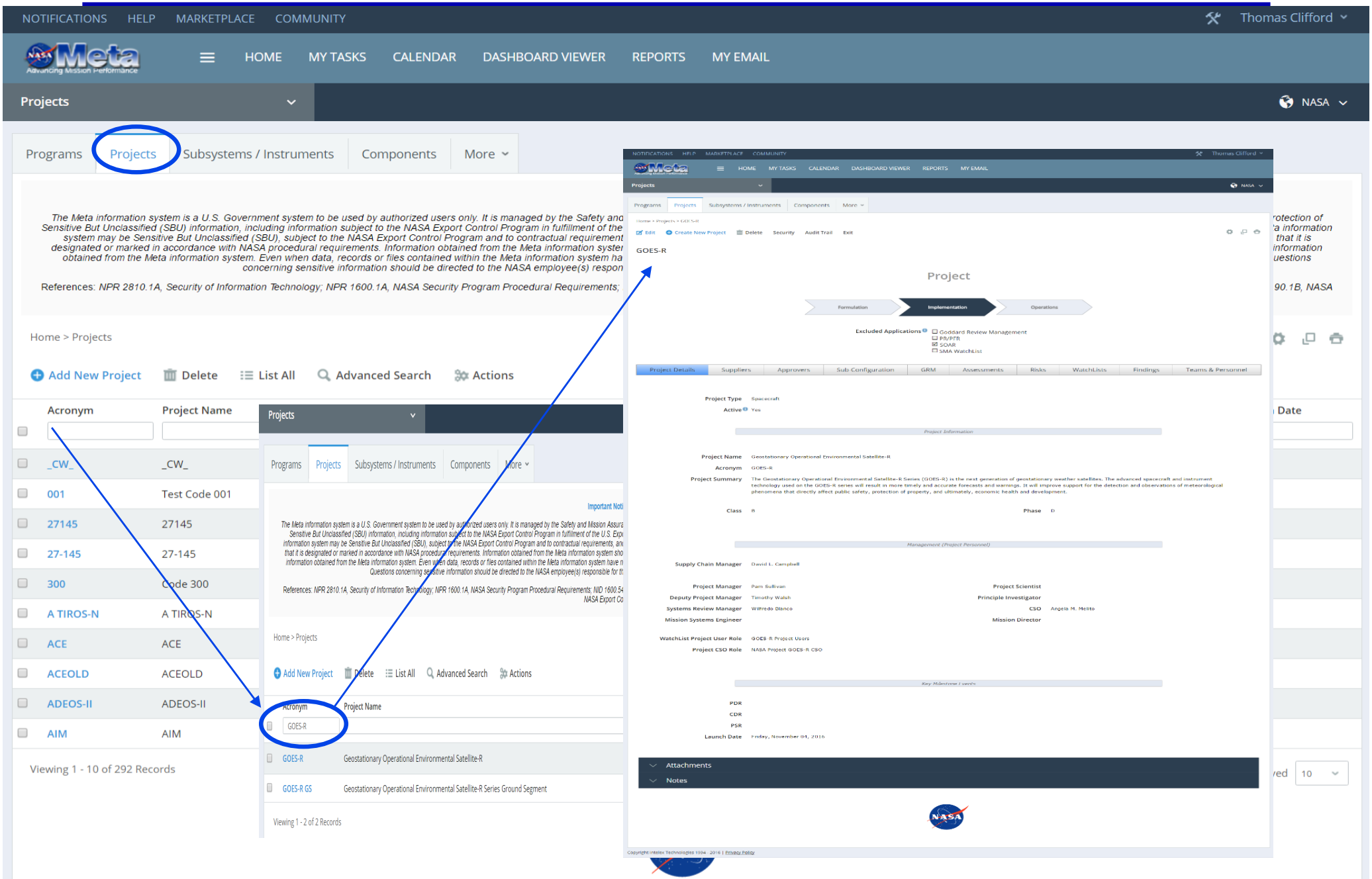
Data / Information Management

Search / Drill-Down



Analytics

- Built-in capabilities for analytics to support process management, in-depth analysis and decision-making
- Standard and customizable search filters
- Standard and customizable output features (data export to xls, pdf, Word)
- Real-time dashboards (data visualizations and tables) for process management and process outputs (results)
  - Drill-down to records
  - Configurable displays

Success Factor: pro-actively engage process owners, users and stakeholders in the upfront planning, design and operational refinement of dashboards

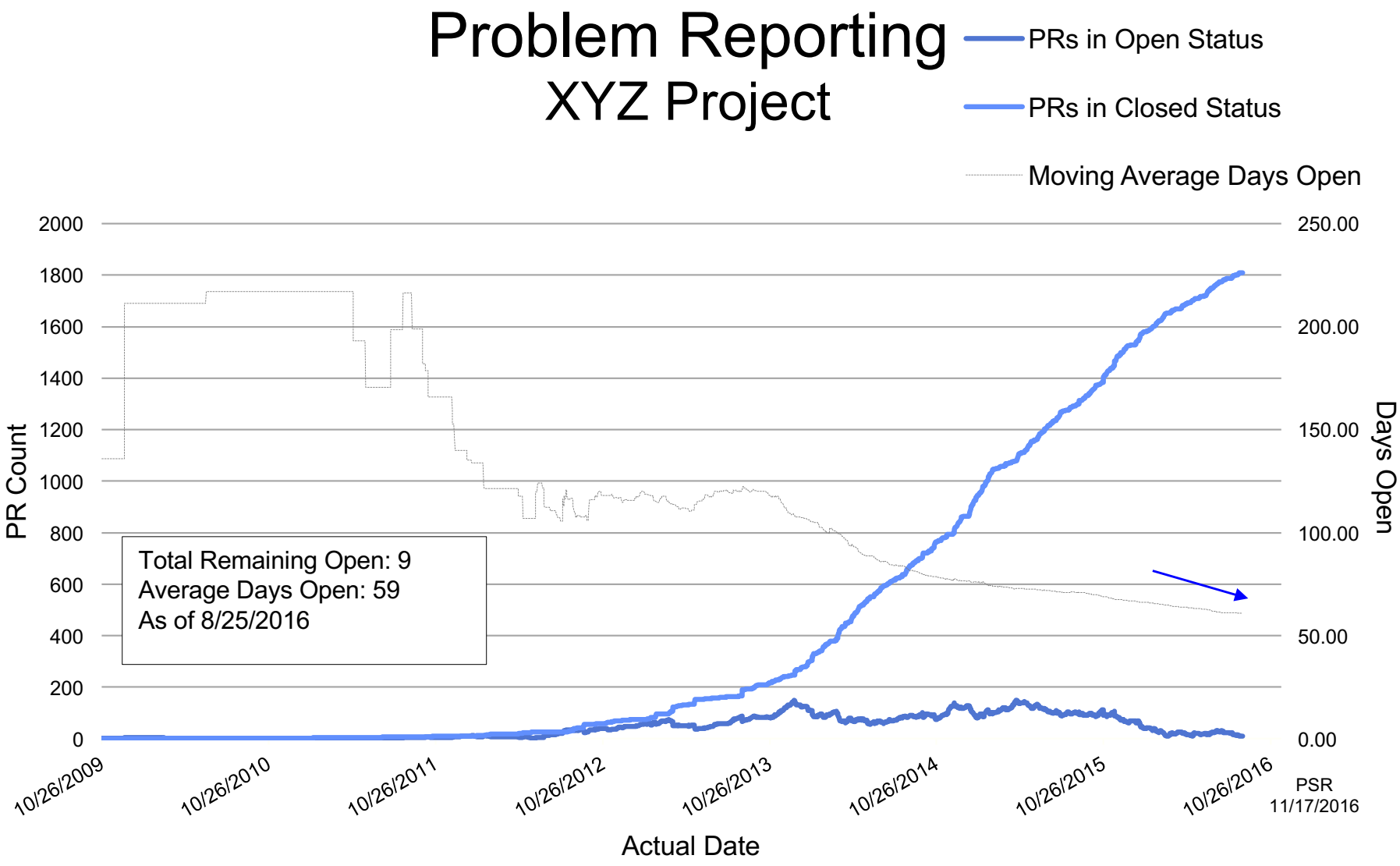
Dashboard

Spacecraft On-orbit Anomaly Reporting

Dashboard

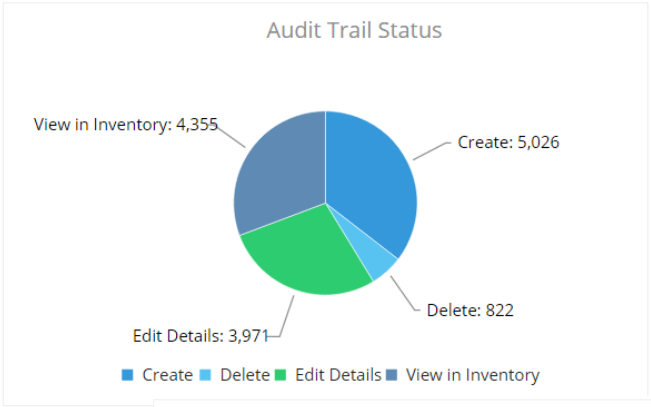
Management System Assessment Findings

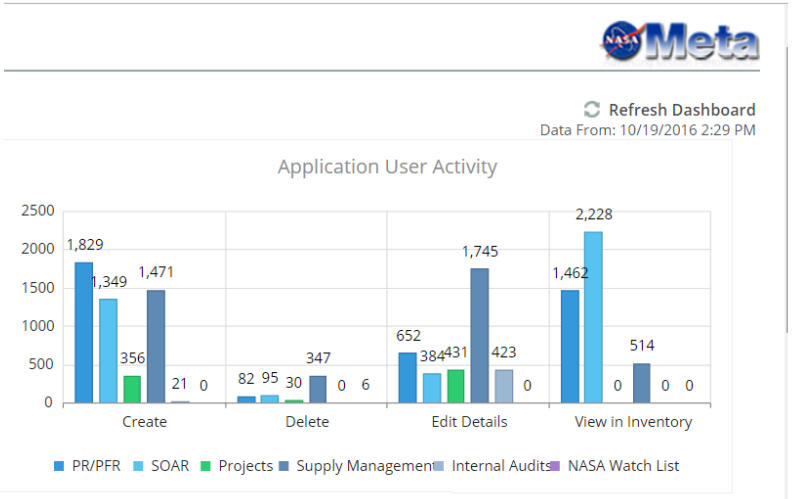
Data Visualization

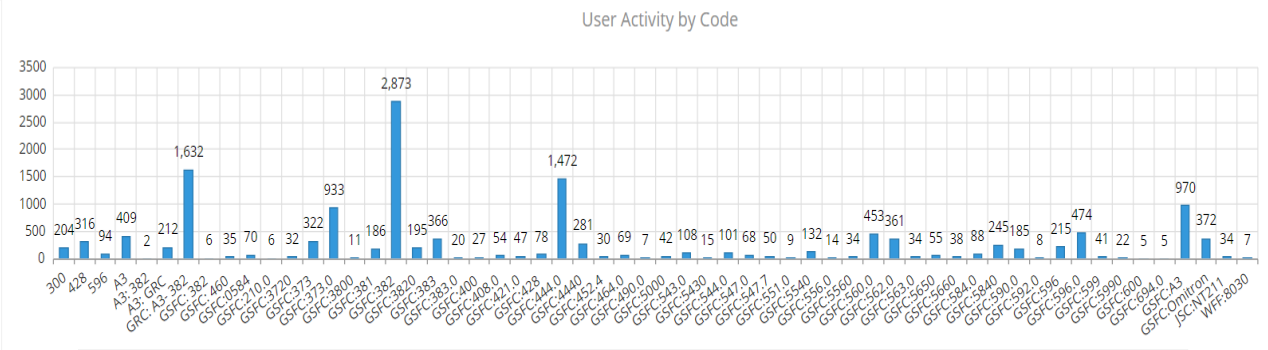


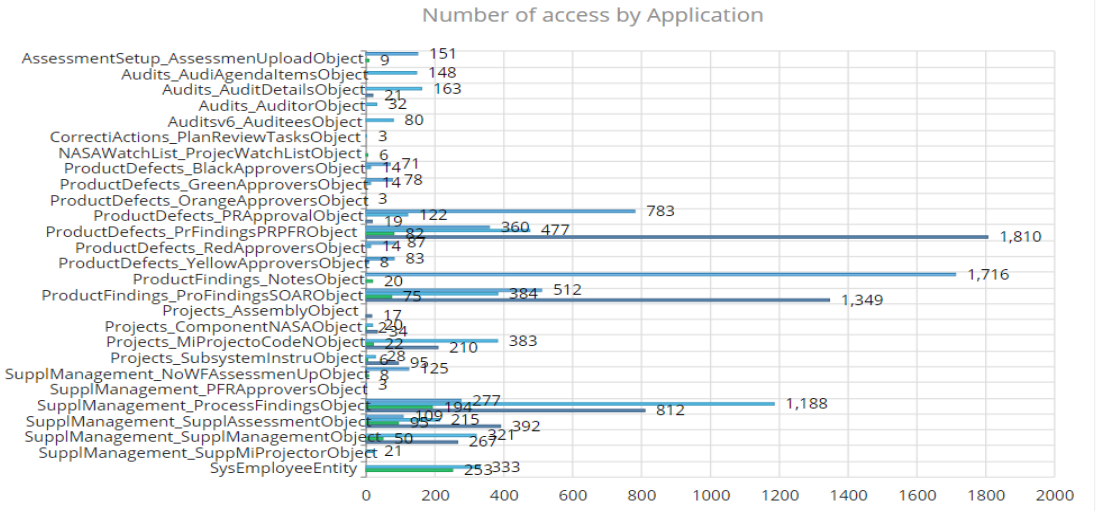
Dashboard

System Utilization









Challenges Ahead

- Continue to reduce process gaps and fill data holes to create unprecedented process / data integration, increasing value for all users as utilization grows (*snowball effect*)
  - Data linkages with other systems and information resources
- Further build-out, refine and *socialize* dashboards / system outputs for process management, analysis and informed decision-making
- Maintain and foster steady growth in system utilization
- Stay abreast of user / stakeholder needs and new capabilities to remain state-of-the market

Legacy Data

State-of-the-market

Information Silos

Scalable

Modernization

Customer Engagement

Transformation

Mission Performance

Process Performance

Analytics

Data / Information Management

System Management

Data/Process Integration

24/7 Access

Operational Security

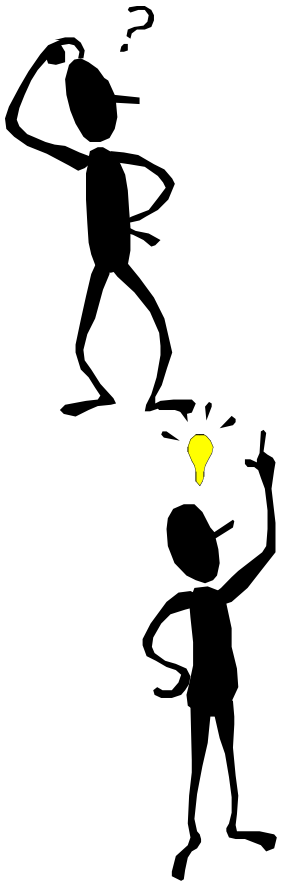
Process Gaps

Solution Design

Data Holes

Process Improvements

Object-Oriented Software

USER OUTREACH / ASSISTANCE

Discussion