One Quality with Agile

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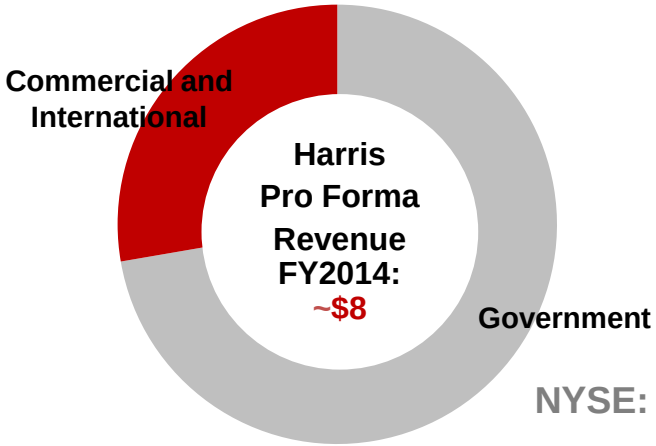
Agenda

- About Harris
- Harris PLM Overview
- The need for “One Quality”
- One Quality Overview
- Four Use Cases
- Summary, Q&A

Harris: Company information

- Advanced, technology-based solutions for government and commercial customers
- 23,000 employees
- 9,000 scientists and engineers
- Customers in 125 countries



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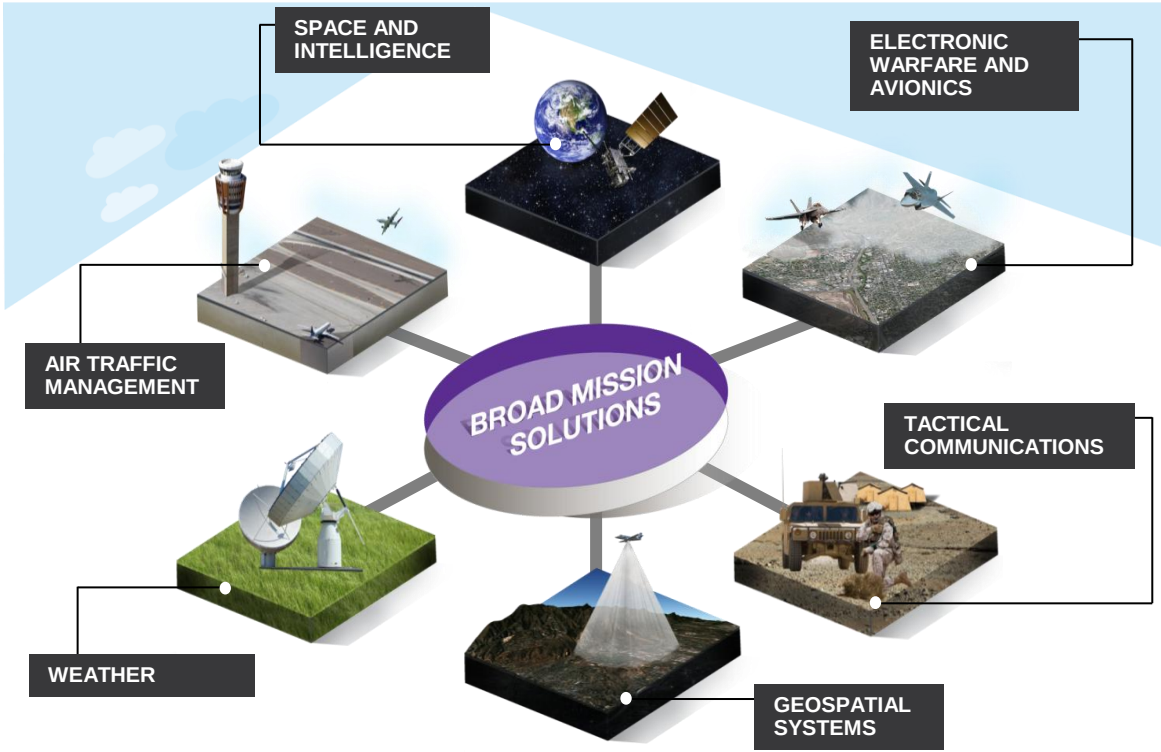

Segment overview

Communication Systems

Tactical and airborne radios, night vision technology, and defense and public safety networks

Critical Networks

Managed services supporting air traffic management, energy and maritime communications, and ground network operation and sustainment, as well as high-value IT and engineering services

Electronic Systems

Extensive portfolio of solutions in electronic warfare, avionics, wireless technology, C4I, undersea systems, and aerostructures

Space and Intelligence Systems

Complete earth observation, weather, geospatial, space protection and intelligence solutions from advanced sensors and payloads, as well as ground processing and information analytics

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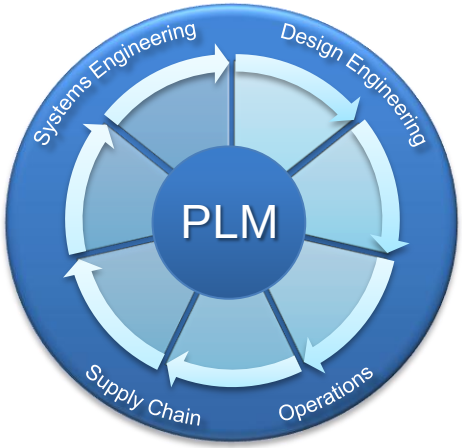
PLM at Harris

- Our PLM environment comprises:
  - Engineering (software/ hardware/ systems) tools
  - Agile (PDM) that manages & controls the design baseline (mostly hardware):
    - Change mgmt of BOMs, documents, as-builts
    - Mechanical & Digital CAD interfaces
    - Quality management
    - Initiates procurement BOMs
- Agile interfaces to a collection of ERP tools: MRP, MES, PeopleSoft, Asset Mgmt, etc.



"PLM" is Engineering tools plus Agile/PDM with custom interfaces to ERP.

Harris Agile metrics (Open-Gov't instance)

Data counts

- >1.4M Parts (& 450k Product Instances)
- >480k Documents (19 subclasses)
  - >1M File attachments (>3.7 TB, ~3.4M s
  - >20k active s, >15k active s, >550k s

Users & teams

- ~5000 accounts; ~3000 users access per month (Open)
  - >1000 Programs; 300-400 "active"
    - teams with standard roles, security

Harris-developed code

- ~450k SLOC
- 73 applications (30 Java PX, 25 script PX, 149 object wrappers, 7 interfaces, 7 web apps)

Infrastructure

- "Open" Production Servers
  - 6 Solaris (5 app/ 1 file)
  - 1 Linux (DB)
  - 1 Windows (AutoVue)
- 2 Production Vaults

Harris has a 10+ year history with Agile and a mature environment.

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Business Need for “One Quality”

Objective: improve **business excellence** …through

1. *Process consistency*
2. *Process efficiency*: improved tools for Quality engineers and program teams
3. *Process transformation*: improved tools for Quality managers and business leaders
4. *Lower costs:* through system simplification, scalability and portability

Inhibitor: **Disparate, disconnected** quality systems

Enterprise quality management

NCRs (Non-Conformances) & Problems

CAPAs

Items & COs


Receiving


Mfg/MES


Customer


Field


Design

Audits


QA

Identify Enterprise Issues

- GIDEP Pubs
- Supplier Discrepancy Reports
- Supplier Support Requests
- Customer Complaints
- (Field) Incidents
- Non-Conformances
- Direct NCRs
- Process Problems
- Audit Findings
- Software Bugs/ Enhancements (PTRs)

Manage Issues through Processes

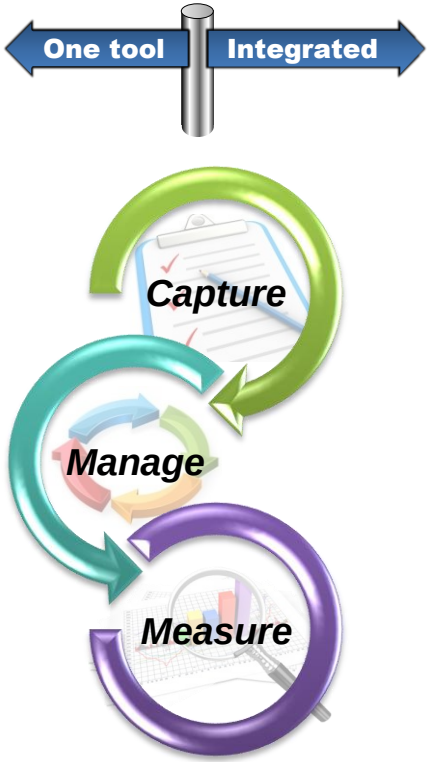
- Failure Analyses
- Supplier Corrective Actions
- Service Actions
- Corrective Actions
- Containment Actions

Resolve Issues through Changes to HW/SW, Docs, & Process

- COs
- Deviations
- A/B Config
- Parts, BOMs, AML
- Documents
- S/W Config

One Quality: Scope, operational concept

- **Requirements**: users /programs wanted **a tool** to…
  - Capture *various kinds* of issues & manage them to closure
    - *Engr/Development → Production*
    - *Hardware, Software, Systems*
  - Be integrated with primary development/ operational tools: Software IDE, Agile/PDM, MES
  - Provide metrics/ analytics
- **Concept of Operations**:
  - Ability to capture & manage issues in native tools
  - A collection point (data mart) to analyze issues & trends
  - Future: some level of integration between (hw/sw) entry/ management tools



Multiple options to capture issues, one analytics back end.

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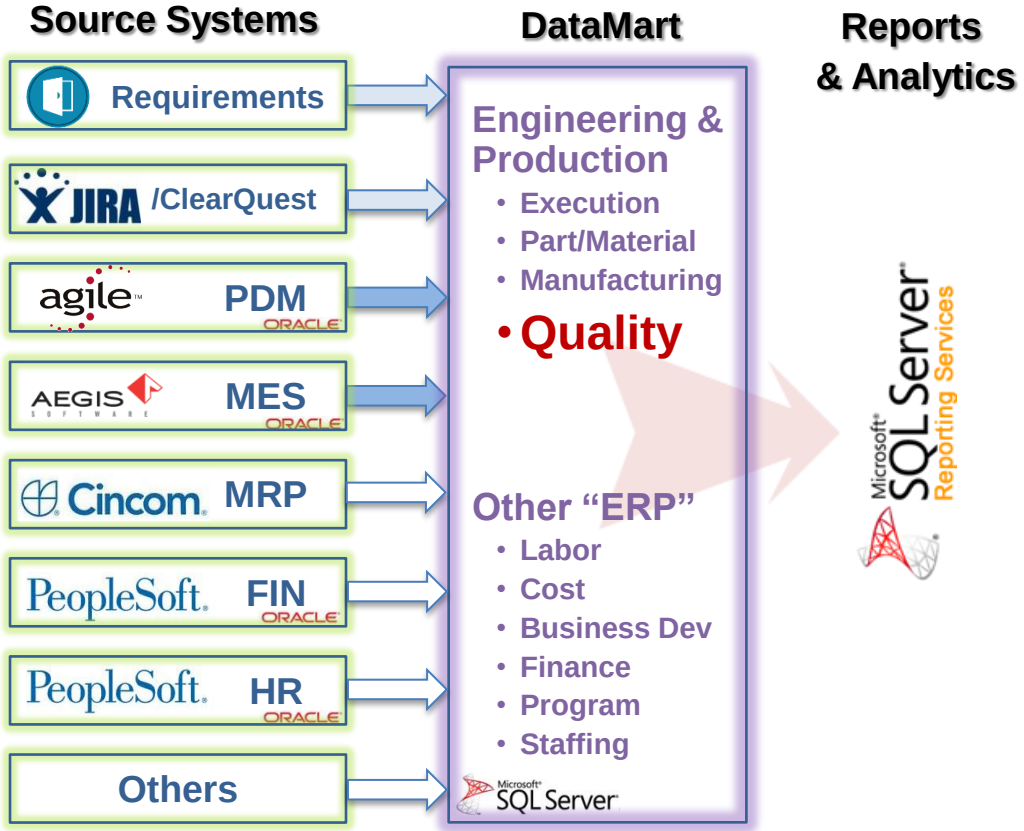
Quality data collection & analysis

- Broad view of quality:
  - Production/ supplier
  - Engineering:
    - S/W issues/PTRs
    - Hardware ECOs
    - Requirements volatility
- Analytics via data mart
  - ‘Source system’ agnostic
  - Join quality data with other enterprise data
- You can only measure what you collect



One Quality process capabilities

Workflow(s)	Description/ Interfaces	Metrics (Open)
NCR	Part/PI non-conformances **Interfaces**: ←MES, ←RIDS, →Vaults, →DWH	>1000 NCRs/ month
SSR	Supplier support (info, discrepancy, FAI) requests **Interfaces**: ←eXpo, →DWH	6800 total SSRs
CAPA	Dispositions, Corrective Actions (incl SCARs) **Interfaces**: →←eXpo, →Vaults, →DWH	>1300 DISPs & RCCAs/ month
RTRN	Customer Returns (one business area)	>750 total RTRNs
GIDEP	GIDEP alerts (Part alerts, advisories)	>680 total GIDEPs
INSP	Inspection Instructions (*related* to Part; *no AI*)	>20000 total INSPs
SPW	Supplier Performance Waiver (*related* to Part; *no AI*)	~580 total SPWs
Process Problem	Systemic process issues worked to resolution	>900 total PRPRs
Audit Finding	Findings from Audits worked to closure	>1300 total AFs
Audits	Audits	2400 total Audits
EFP	Effectivity Plan; ensures closed loop change process	(new November 2015)

1000s of users interact with >10K PQM (& related) objects each month

Other process capabilities

Workflow(s)	Description/ Interfaces	Metrics (Open)
ECO, NR, RBP	Change mgmt of Parts/BOMs, Vendor parts **Interfaces**: ←Digital, ←Mech, →MRP, →MES, →Vaults, →DWH	~1300 ECOs/ month ~1400 NRs/ month
BCO, RCO	Release & change mgmt of Product Instances **Interfaces**: ←MES	~3600 BCOs/ month ~650 RCOs/ month
EMR	Procurement request (demand generation) **Interfaces**: →MRP, →DWH	~500 EMRs/ month
Mat'l Request	Can drive generation of EMR/demand; BIN process **Interfaces**: ←BIN	~400 total MRs
Traveler	Work instructions (*related* to Part; *no AI*)	>10000 total Travelers
Under Development		
Digital WO	ECAD Library work order (~3 related CRs) **Interfaces**: →←Digital	(new January 2016)

Quality assurance doesn't end with quality records.

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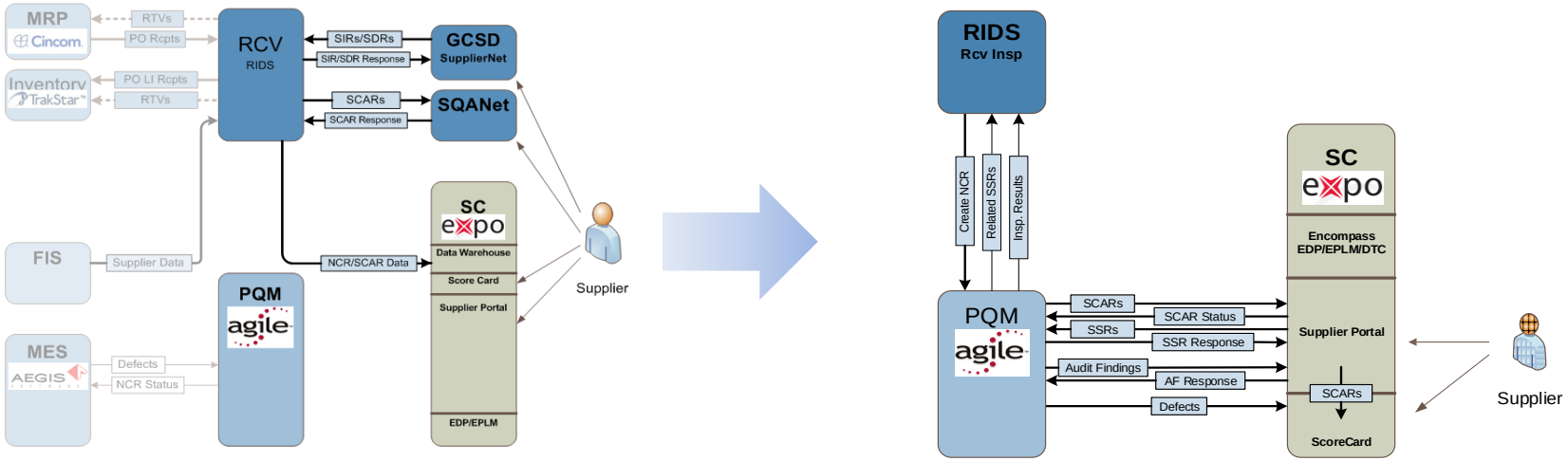
1. Supplier Quality

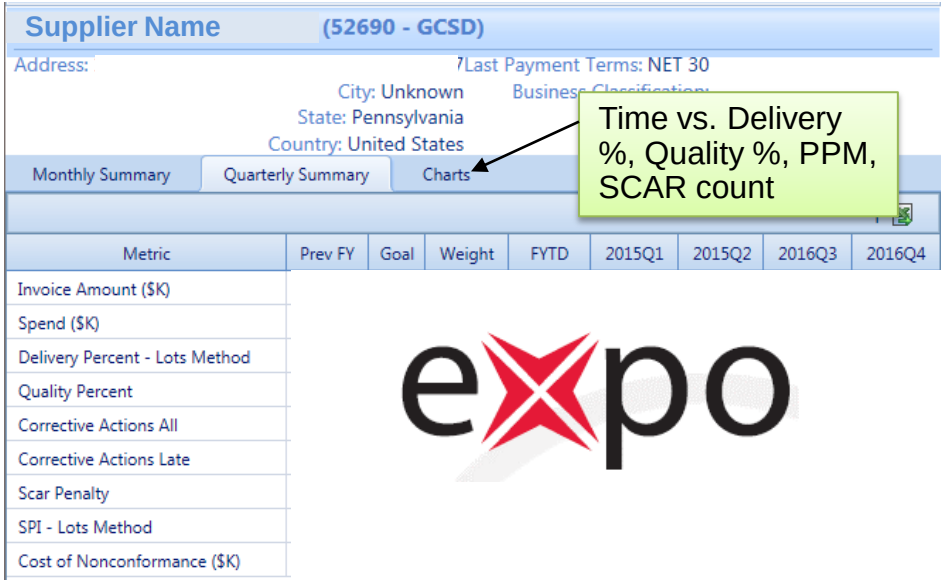


- Benefits: system simplification
  - Efficiency/ access for: SQEs, QEs, Inspectors, Buyers, Engineers… (& Suppliers)
  - O&M costs: eliminated tools (RIDS, SupplierNet, SQANet) & interfaces
  - Extensibility: adding record types (AF, FAI, Supplier CN); sending to dataMart

Supplier portal, including scorecard

- The Harris SC portal is a single point of access for our suppliers

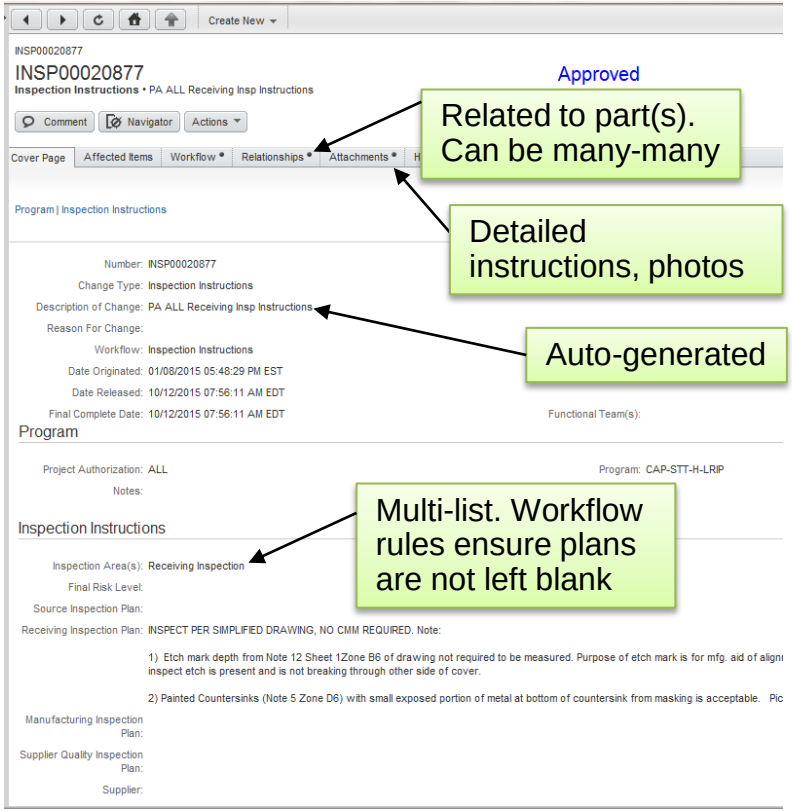
1. Quality information:
   - SCARs
   - SSRs (discrepancies, information, ECRs…)
   - Audit Findings
2. Procurement information:
   - POs, Q-Clauses
3. Scorecard visibility →
   - Includes deliveries, quality



Our SC portal includes two-way communication with Agile.

2. Inspection Instruction Records

- 42K legacy Receiving Inspection records; cleaned to 27K migrated
- Simple workflow
- Benefits:
  - Accessibility (QEs, Inspectors, etc.)
  - Extensible (included other inspection types)
  - Enforced standards, data integrity
  - Auditable (history)
  - Low maintenance costs

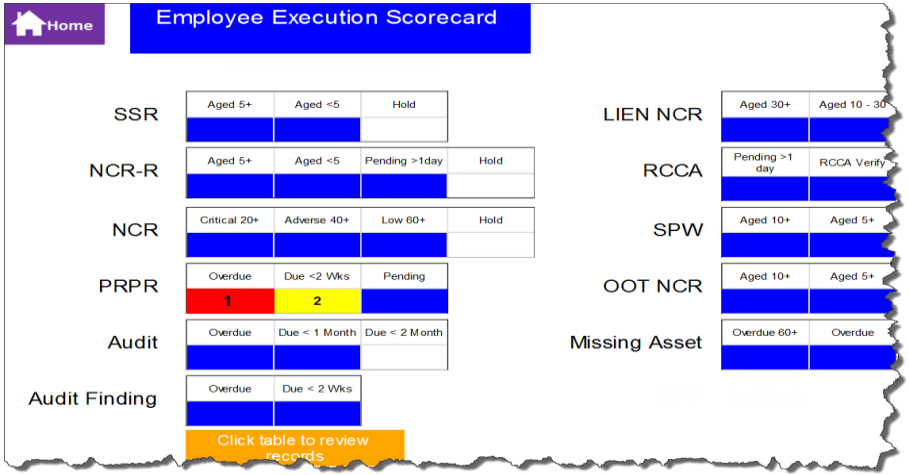


3. QE Execution Dashboards

QE Dashboard

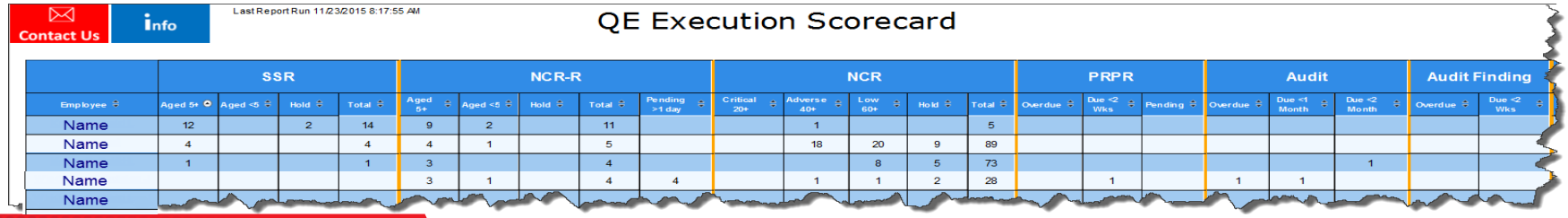
- Emailed daily: shows past due, soon due
  - Eliminates non-value added labor
  - Eliminates delay/risk: reduced aged/ overdue

	"Manual" Process	Admin Support Process	Dashboard Process
Cost			$18K
Annual Savings		$70K	$140K
Risk Level	Daily Status	Weekly/ Monthly Status	Daily Status



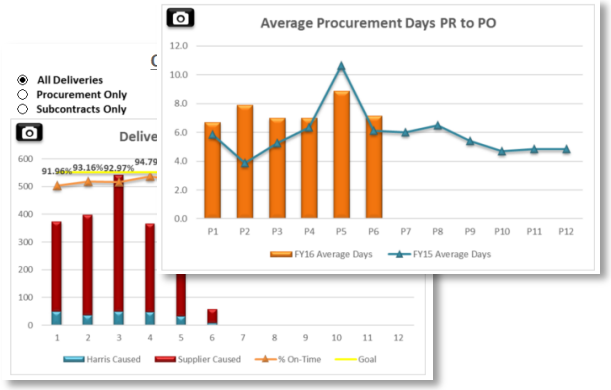
Manager's Dashboard

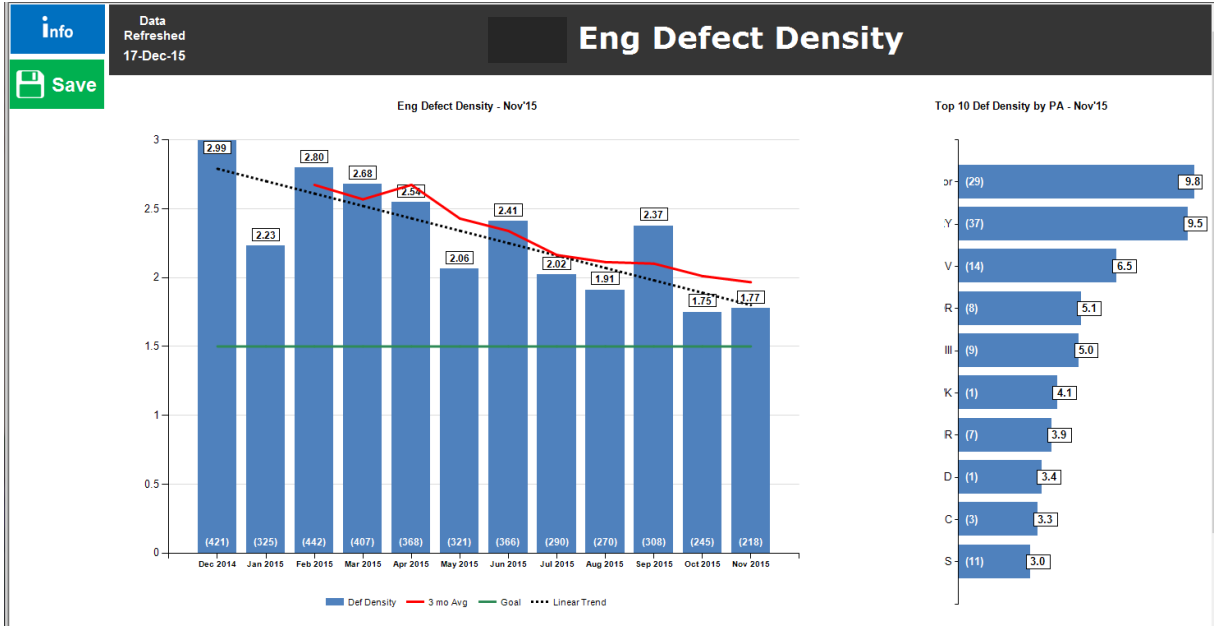
- Measures performance on key quality records
  - Can be used to determine resource requirements



4. Program/Functional Dashboards

- Combining PLM & Quality data with labor & financial data allow us to track performance metrics such as…
  - Engineering defect density ↘
  - Cost of poor quality
  - CAPA effectiveness
  - SC performance





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Summary

- Agile is the primary platform for One Quality at Harris
- One Quality enables business excellence through process consistency, efficiency, and transformation
  - Many disparate quality data collection systems were **eliminated**
  - **Connected data** enables real-time analysis and faster, more informed decisions
  - Data **analytics** allow us to spot trends and focus process improvement efforts