



Deploying Quality Notifications at Crown Equipment Corporation: Lessons Learned

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Quality Management & Product Traceability, Crown Equipment Corp.
Colin Roney, Engagement Director, Quality Management Solutions, Inc.
Session ID # 84516

About the Speakers

Steven Harmeyer, Crown

- Global Process Leader
- 8+ years with Crown.
- 20+ years in Operations in Automotive, Medical and Government sectors.
- Experience in Management, Quality, Lean, and Six Sigma.
- Clint Eastwood was in a movie with me.

Colin Roney, QMS

- Engagement Director
- Eleven years working in Operations on business side of Fortune 500 companies.
- Fourteen years SAP experience (Eight as Functional Consultant)
- Spent five years working in Mexico
- 488 voters cannot be wrong.

Key Outcomes/Objectives

Make Notifications an effective cross-functional solution to resolve issues and drive improvement.

- Make data effective for problem analysis.
- Gather shop floor quality costs quickly.
- Leverage Action Box for cross-functional partners.
- Use Document Flow to create a document trail.
- Provide information rich data.

Agenda

- Company Overviews
- Project Overview
- Cross-Functional Quality Notification
- Item Data
- Costs
- Action Box
- Document Flow
- Worklists
- Next Steps

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About Crown Equipment Corp.

One of the World's Largest Lift Truck Manufacturers



5 regional headquarters



3.08 Billion USD FY2017



15,500 employees



19 manufacturing plants in 11 locations worldwide



Over 500 retail locations across 84 countries



Leader in material handling innovation and technology



Global line of trucks designed to local work practices



Innovative fleet management solutions



Family owned and managed industry leader since 1945

Global Line of Lift Trucks

Designed to meet local standards and operator preferences



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- Focused on delivering results using SAP to meet complex regulatory, quality and unique business requirements while creating Best Practices throughout the SAP Ecosystem.
- QMS – Winner of the Inc. 5000 “Fastest Growing Companies Award” 5 Years running- a remarkable achievement.



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Project

- Replace Legacy Systems.
- 1st GoLive; R1 – Scope; 1 - Plant; QM-Lite; No enhancements.
- Expand QM functionality with each release.
- Crown project team emulates the business value chain.
- The Crown QM team is made up of 3 – Crown employees with 70+ years of Crown experience and 2 – QMS consultants.

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Quality Notification Partners

Users and Roles

- Shop floor: Supervisors, Group Leaders, Operators
- Quality: Engineers, Technicians, Leaders, Inspectors
- Support: Mfg. Engineers, Production Planners, Purchasing Sourcing Specialists, Accounting and Various Admins.

Quality Notification Anatomy

The screenshot displays the SAP 'Create Notification: Vendor Int/Ext Issue' interface. At the top, there is a navigation bar with icons for Partner, Object, Notification, Order, Action Log, and Document Flow. Below this is a header section with fields for Notification (00000000001), Z2 Vendor Int/Ext I., and OSNO NOTE. A purple dashed box highlights the 'Document Flow' icon in the navigation bar. The main area contains several tabs: Overview, Detail, Documents, Update Details, All Tasks, QA Info, and Costs. The 'Documents' tab is active, showing sections for Reference Documents, Reference object (Material, Revision level, Serial Number, Device data, Vendor Mat. No., MPN material), Business Unit, Quantities (Complaint qty, Ref. quantity, ReturnDelivQty, Def. qty (int.)), and Subject (Coding, Description). On the right side, there is an 'Action box' containing a list of actions such as 'ASSIGN TSK > USER', 'Disposition Material', 'Request RMA from Vendor', 'Issue A Quality Alert', 'Activate Insp. at Mat'l. Mstr.', 'Update Inspection Plans', 'Create Return PO or STO', 'Take Mat'l to Shipping', 'Transact GR on PO w/o Stk', 'Transact GR on PO w/ Stk', 'Create Rework Order', 'Create Buyback PO', 'USER ASSIGN STK MVT TSK>INSP', 'ACCEPT-Return Stk. to Loc.', 'REWORK-Put Stk. in Rework Loc.', 'TDN-Return Stk. to Loc.', 'SCRAP-Move Stk. to Scrap', 'RTIV-Move Stk. to Return Loc.', 'RTEV-Move Stk. to Return Loc.', 'INSP EXECUTE STK MVT TSK', 'Move to INSP-Create Insp Lot', 'Move to Rework', 'Move to MRB or RTV', 'Return to Stock', 'Block Stock', 'Unrestrict Stock', 'Scrap Stock', 'Scrap Rev from GM 552', 'Strt Stk Trnsfr to B.U. GM 313', 'Fsh Stk Trnsfr to B.U. GM 315', 'USER EXECUTE TRANSACTION TSK', 'Create Quality Notification', 'Create Return Purchase Order', 'Create Stock Transfer Order', 'Create Rework Order', and 'Create Buyback Purchase Order'.

7 Tabs

1. Overview (Header)
2. Detail
Item (defect)
Priority
Partner
3. Documents (Actions)
4. Update Details
5. Tasks / Action Box
6. QA Info: Activities
7. Costs

Quality Notification Data Process

Inputs

1. Overview

ref. docs.
ref. objects
quantities
subject

2. Detail

custom item
priority
partners
costs

SHOP FLOOR



**Quality
Notification**



Outputs

3. Documents

4. Update Details /
Std. Item

5. Tasks / Action box

6. QA Info

7. Costs

Worklists / Analysis

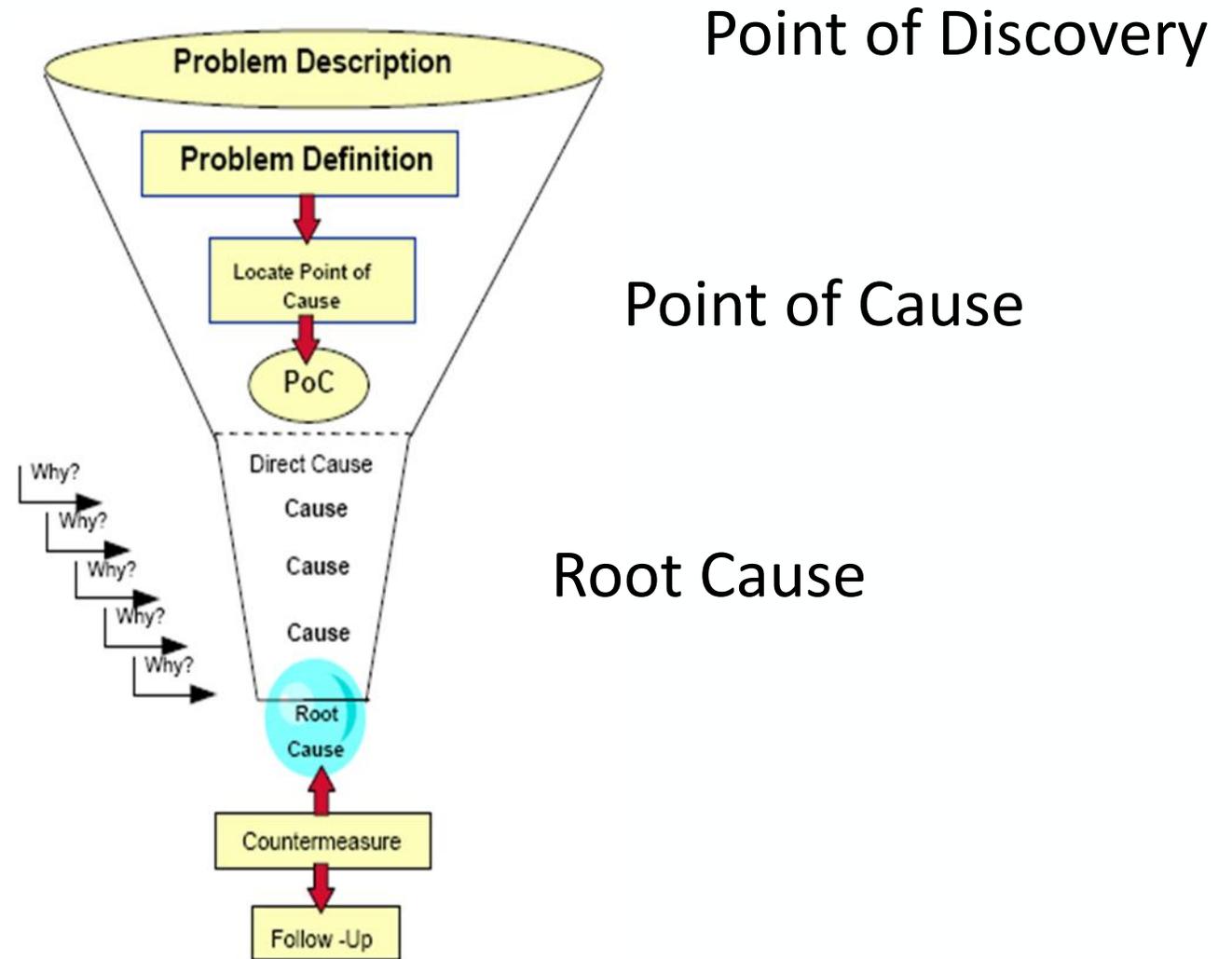
SUPPORT

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Item Data Requirements

To facilitate continuous improvement and problem solving, the solution must provide visibility to point of discovery and point of cause including vendor, relative to frequency, cost, and organizational structure e.g. Company, Plant, Business Unit, Cost Center, and Work Center.



Point of Discovery versus Point of Cause

Standard functionality allows one work center per item or header to be associated in the notification.



Point of Discovery versus Point of Cause

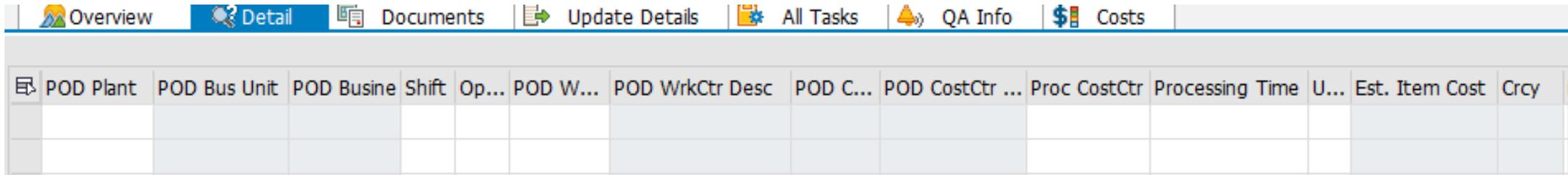
- Background: Material routings cross business units and plants and requires multiple days to process orders.
- Standard functionality is only effective with rigorous inspection after each operation to obtain PoC data.
- Defects may be detected downstream from point of origin. Standard does not provide for PoC data.

Item Data

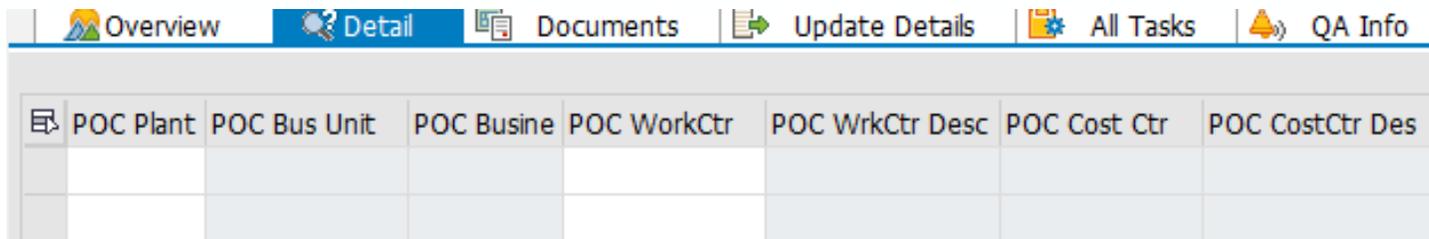
Standard Item screen data did not meet requirements.

- Enhancement: New Item Screen
 - leverage work centers, cost centers, business unit and plant to identify Point of Discovery and Point of Cause.
- Enhancement: Add Cost sub-screen from Claims Notification.
 - allows input of time consumed on an issue and the work center performing the work.
 - cost is rendered from cost rate of cost center for internal activities, and/or material cost, and/or variable cost.

Custom Item Screen (Detail Tab)



POD Plant	POD Bus Unit	POD Busine	Shift	Op...	POD W...	POD WrkCtr Desc	POD C...	POD CostCtr ...	Proc CostCtr	Processing Time	U...	Est. Item Cost	Crcy



POC Plant	POC Bus Unit	POC Busine	POC WorkCtr	POC WrkCtr Desc	POC Cost Ctr	POC CostCtr Des

- Faster data entry by allowing users to work across items.
- Links items to POD and POC plants, business units, cost centers and work centers.
- Relates items and relative POD and POC data to costs.

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Measuring Quality Costs

- Standard functionality exists in QM Orders and Defect Class to get some means of quality costs but did not fully meet business requirements.
- Must include shop floor and support personnel time in quality costs as well as material losses and rework order costs.

Cost Screen (Costs Tab)

- Deployed Claims Notification Cost screen to track cost at the Item level.
- Ability to link cost items to specific notification items.
- Subtotals per item in append field on QMFE
- Total is stored in append field on QMEL

Company Code

Costs

Estimated Currency

Required

Accepted

Planned costs

Amount Currency



Costing Items : Missing Terminal Flag

ItmNo	Item	Res	Plant/A	P	Quantity	Unit	Total Price	Value	Crcy	De	Cost	Reference (Notification Item)
1	M	162			1	EA	26,415.16	264.15	USD	HA	543	0001
2	E	201			3.421	H	0.01	0.00	USD	Pr	943	0001
3	E	201			3.421	H	33.56	114.81	USD	La	943	0001
4	M	093			2,104.100	"	0.22	4.63	USD	WI	543	0001
5	M	093			1,483.500	"	0.22	3.26	USD	WI	543	0001
6	M	062			4,823.000	MM	0.08	3.86	USD	WI	543	0001
7	M	093			519.300	"	0.22	1.14	USD	WI	543	0001
8	M	062			4,092.000	MM	0.02	0.82	USD	WI	543	0001

Other Benefits of Measuring Cost of Quality

- Majority of quality costs do not result in material adjustments or rework orders.
- Enhancements allow us to more accurately measure true quality cost by defect.
- Measured in Notifications versus Actual costs recovered.



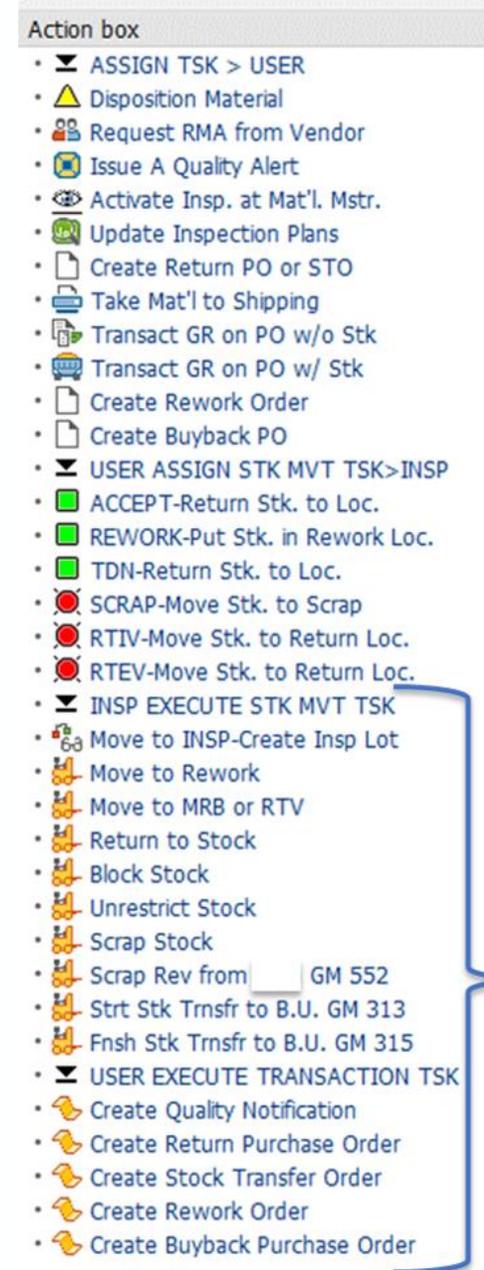
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Action Box

Beyond Tasks to Function Modules Cross-Functional Partners

- Task Specific Goods Movements
- Role Specific Task Functions
 - Rework Order
 - Return Purchase Order
 - Return Stock Transfer Order
 - Quality Alert
 - Corrective Action

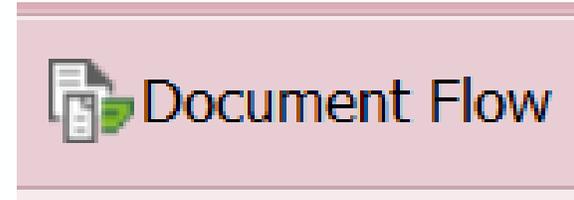


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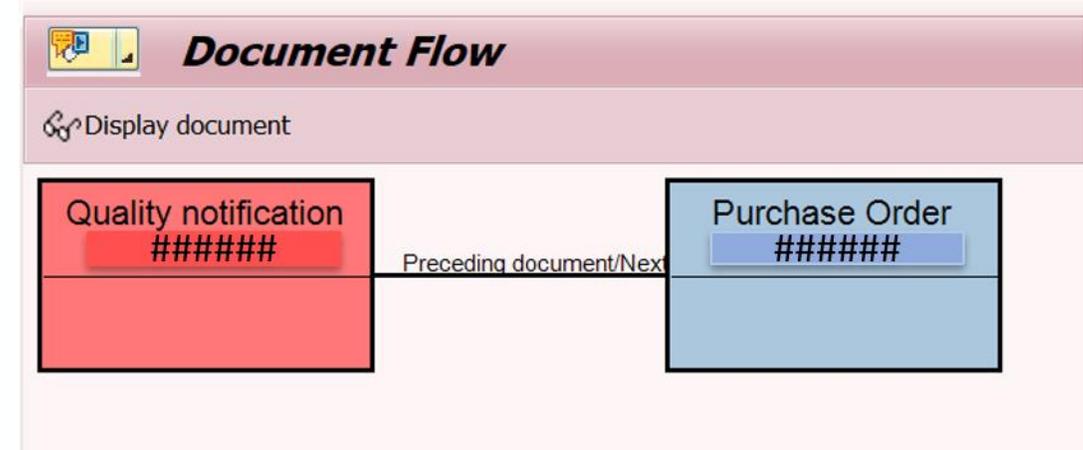
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Standard Document Flow



- Document flow links objects related to a notification.
 - Inspection Lot
 - Purchase Order
 - Production Order
 - Reference Notifications
- Allows displaying of objects from Document Flow

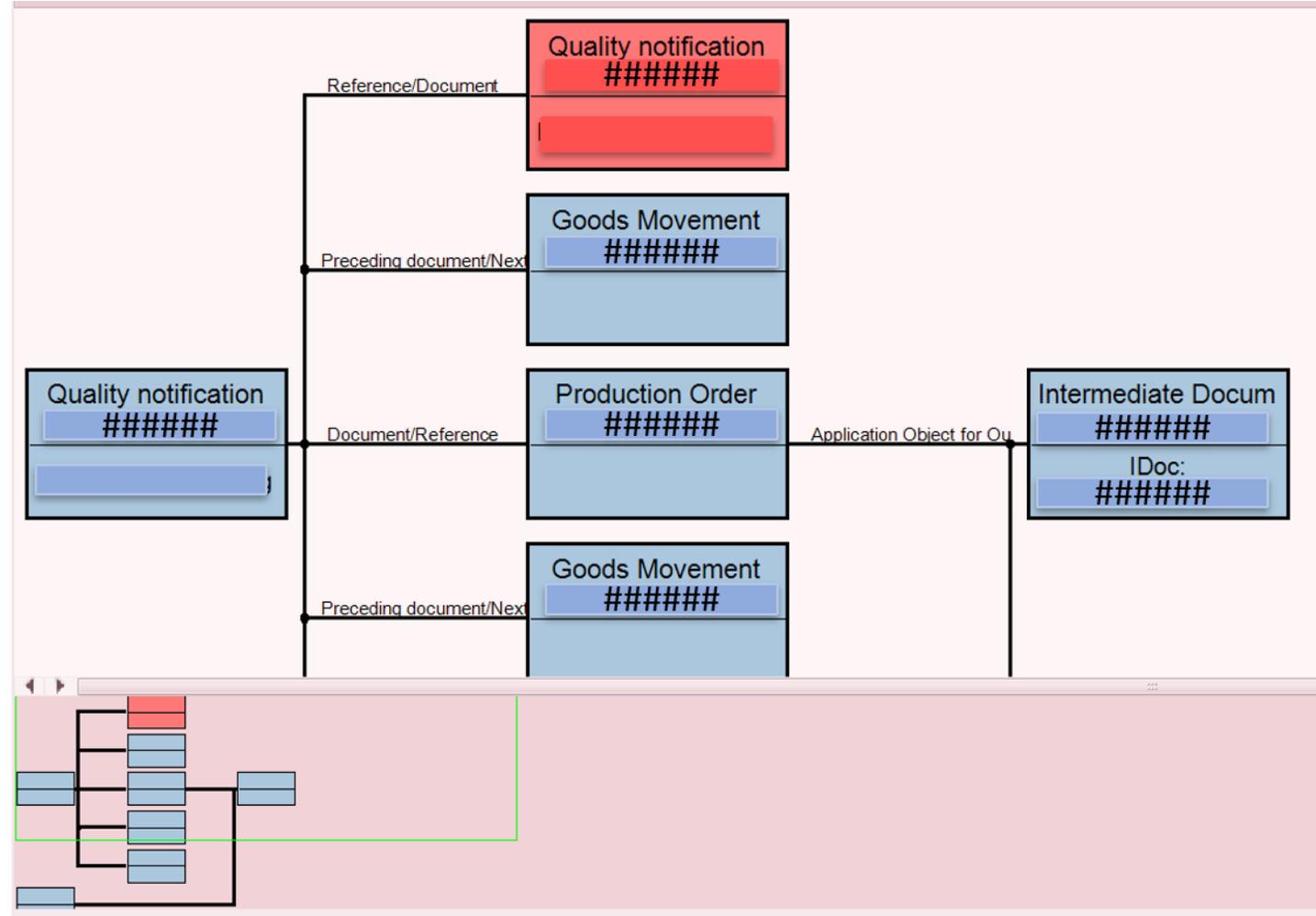


Document Flow and Action Box

- Notifications manage complex cross-functional quality processes and act as the hub for transactions and activities.
- Developed function modules to execute transactions, eliminate redundant data entry and link system actions in Document Flow, leaving a document trail.

Enhanced Document Flow

- Cross functional partners start work from notification.
- Dynamic document trail created.
- Tasks tab allows users to see progress of notification.
- Document Flow allows users to validate actions taken.
- Much more efficient than running down various transactions e.g. MB51, MIGO, COOIS, etc., and trying to connect the dots.



Agenda

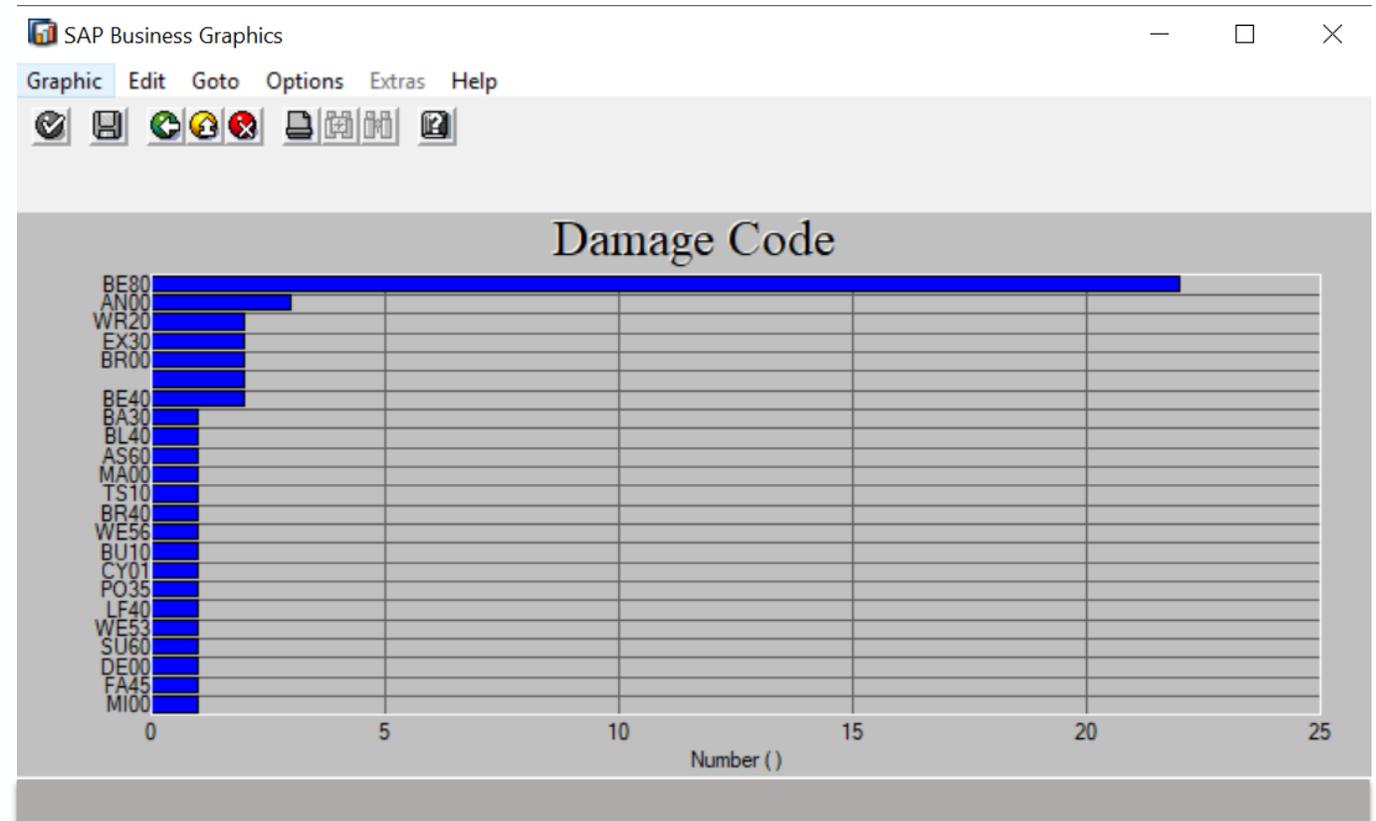
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Enhanced List Displays

- Standard List Displays QM10-17 are incredibly powerful but have limitations
- Append fields at each level can be added to their respective list display (e.g. item level append fields can be added to QM14 & QM15).
- Header level append fields would be useful beyond QM10 & QM11 but technical limitations prevent their addition.
- SAP Graphics has some functionality but is rudimentary

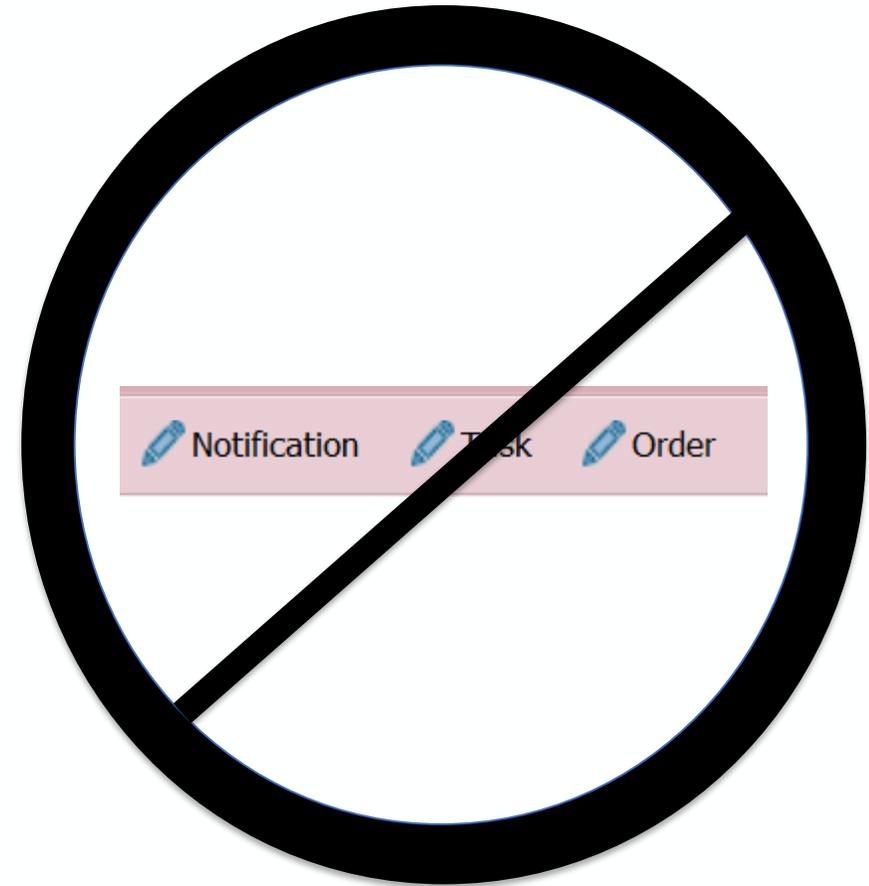
Enhanced Reporting Transactions

- ABAP Query (SQ01, etc) can be used to generate reports that include append fields from multiple levels of notification



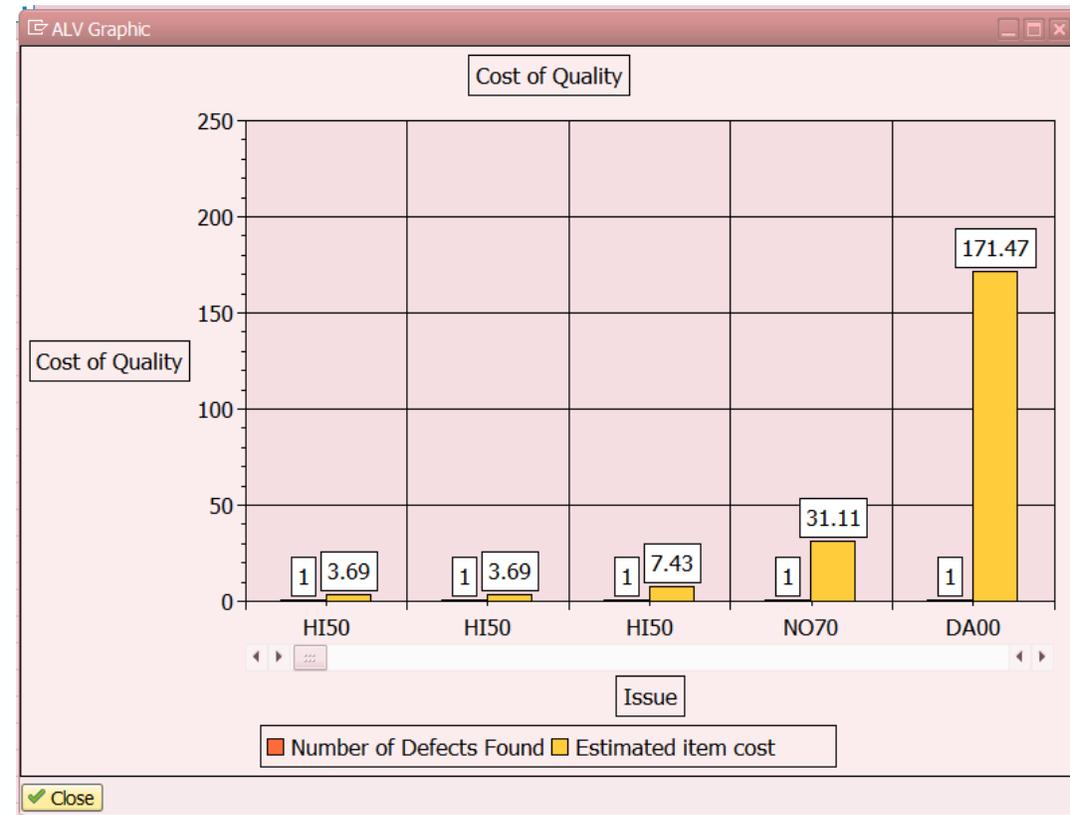
Enhanced Reporting Transactions

- Drilldown functionality from standard list displays can be emulated in a limited fashion but is not as good as the original
- In SQ01 you are limited to one transaction for drilldown functionality

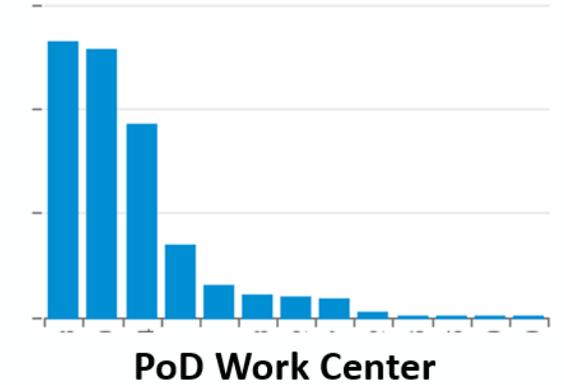
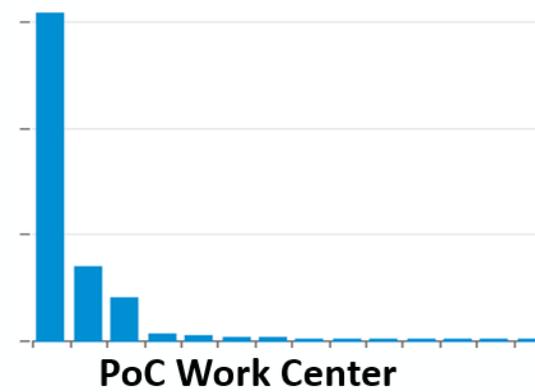
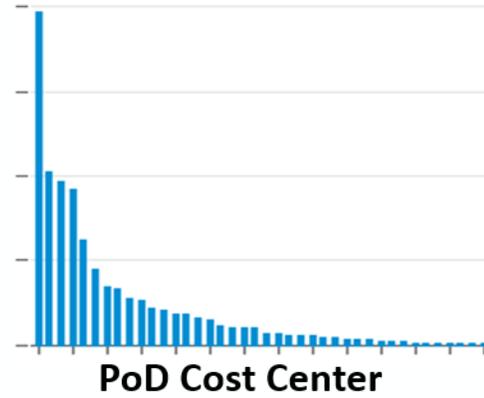
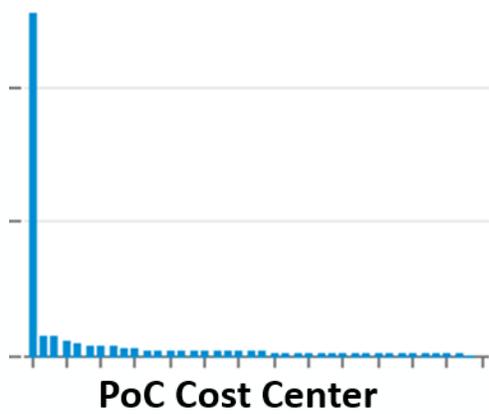
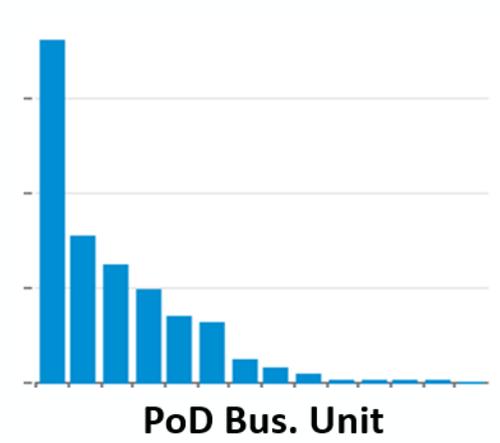
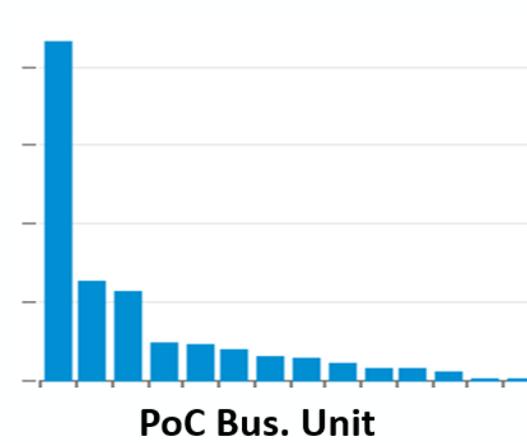
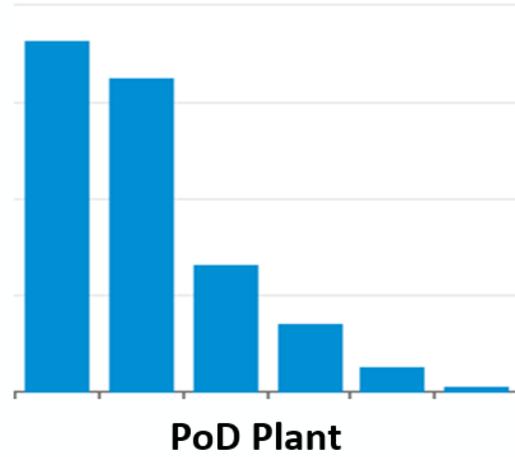
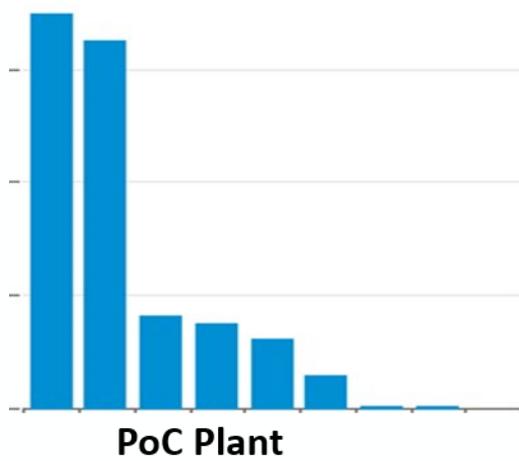


Enhanced Reporting Transactions

- SQ01 uses updated SAP Graphing engine but it has some limitations (e.g. unable to display subtotals and rank)



BIBW Reporting



Coming Together

- The custom item screen with PoC and PoD data along with worklists and BIBW provide visibility to the organization at every level to see impact to the business and greatest opportunities for improvement.
- The document flow and cost screen supports cost recovery initiatives and compliance to ISO.

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Future Roadmap for QM at Crown

- Complete roll-out of QM to all Crown sites.
- Use quality notification solutions for things other than quality. PAs, PDIs, Requests, etc..
- Ad Hoc Reporting in BIBW
- Continuous Improvement

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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 steven.harmeyer@crow.com
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