

# zDevOps and “Production Ready” Testing

What is it? Why is it important?

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SEA

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Session **NI**



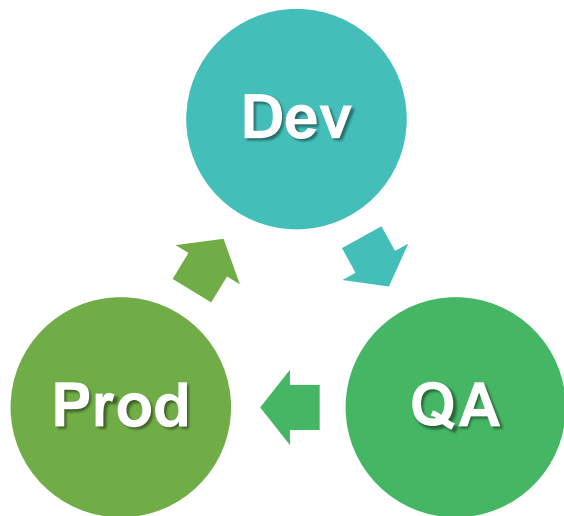
# Agenda

- Introductions
- Why
  - Testing as a DevOps Priority?
  - Production Ready Testing?
- Considerations
- Reporting and Measurement

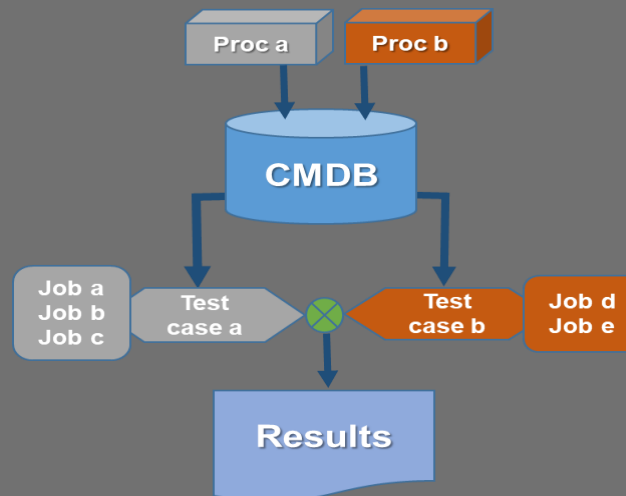
The Challenge Today

# How Do I Increase Velocity AND Quality In Application Delivery?

# Why Production Ready Testing?



*Predictive Runtime Testing for  
Build And Run Teams*

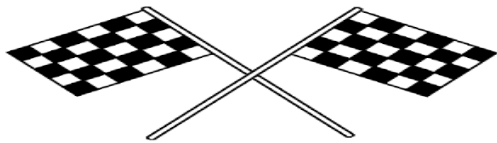


# Culture



## Agile Build

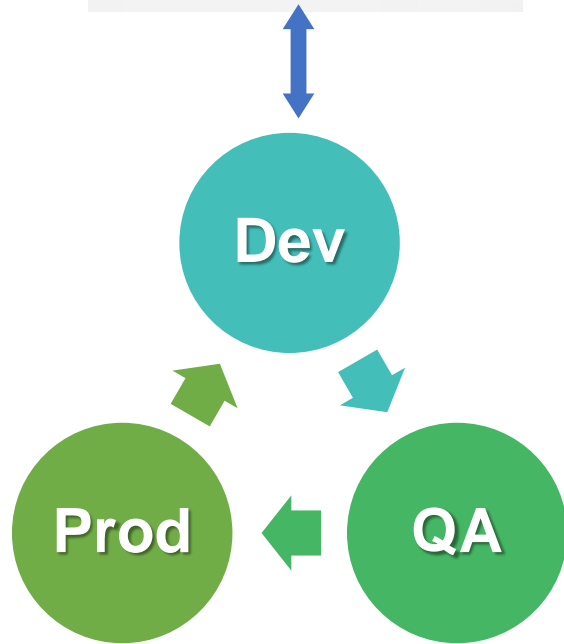
## ITIL Deploy



Fast is Good!

Fast is Not as Good!

# The Opportunity or Metrics



## ❖ Reporting and Metrics +

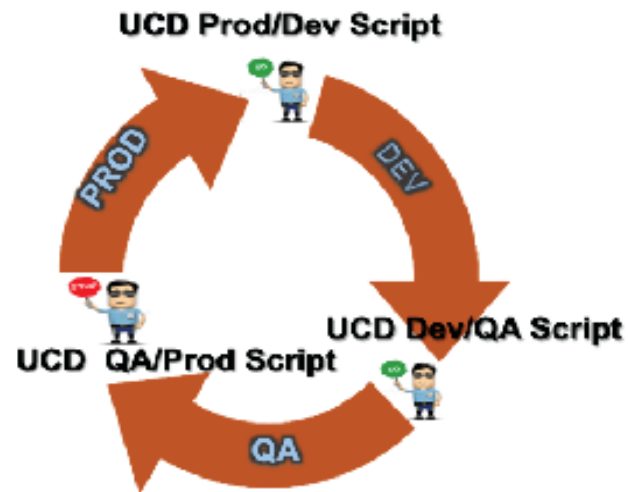
- Show me only “dataset not found” conditions!
- Show me only JCL naming standard violations for my Dev Environment!



- Are we using the process?
- What is the ROI of our process ?
- Are we trending in the right direction?

# Considerations- *Modular Design with Complete Accessibility*

*Approaching Continous Deployment of new versions of the job stream definitions*



**JCL Management Services for IBM WA**

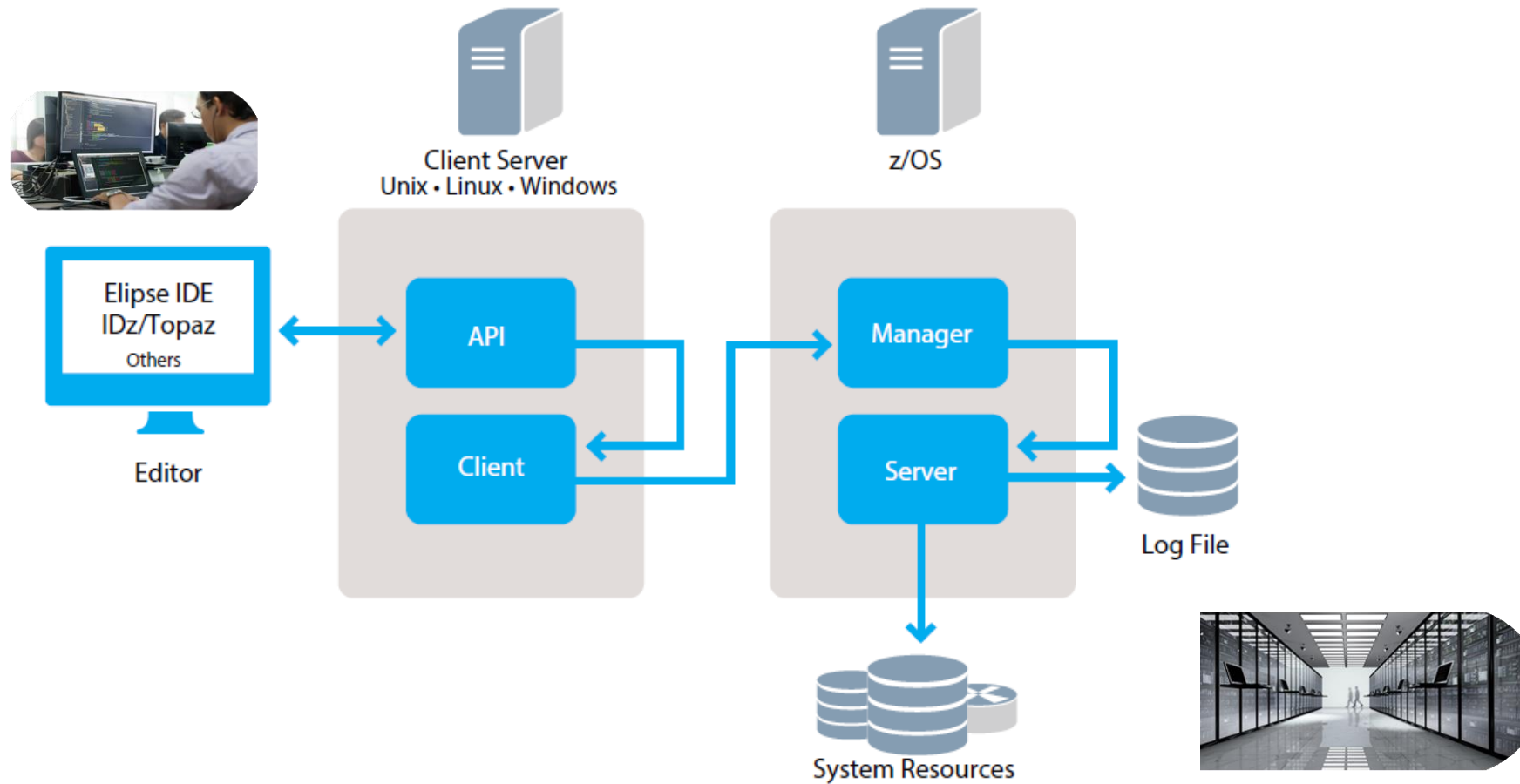
- Extract/Resolve
- Convert
- Test
- Standards Enforcement
- Impact Analysis

- IWS Variables/Directives
- Batch Metadata
- JCL Source Management

Target Environment for Test Execution

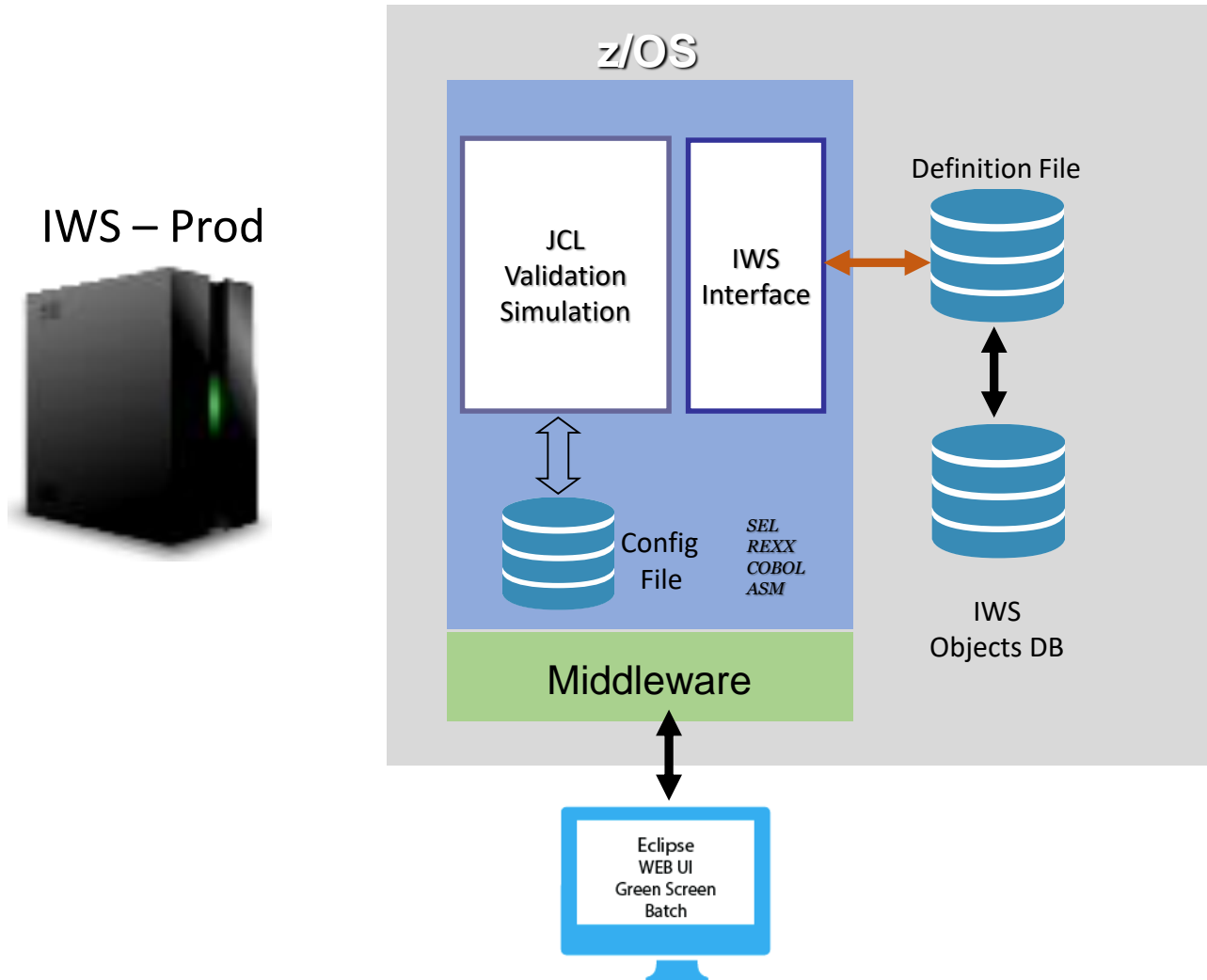


# Considerations– Architecture



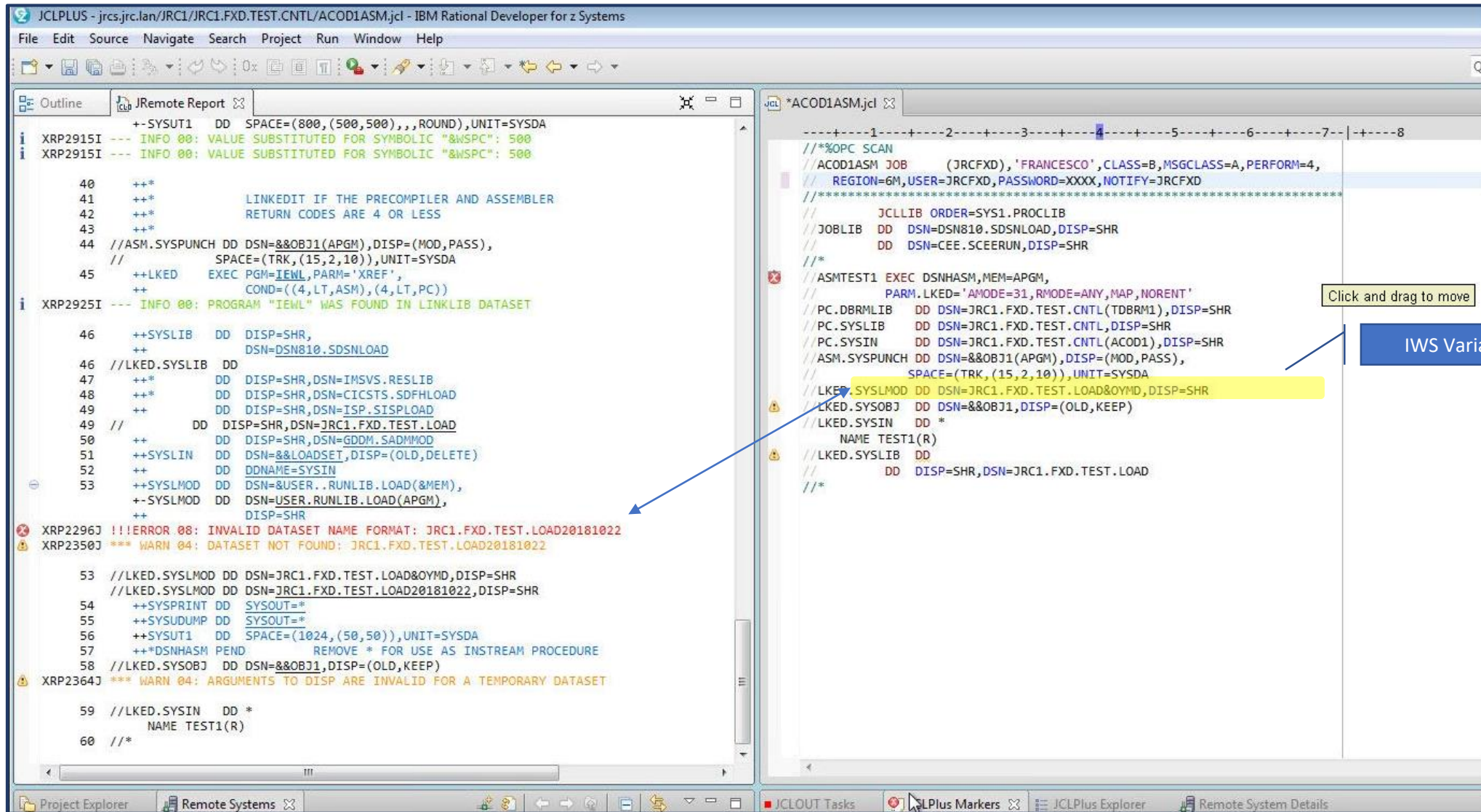


# Considerations— *Anticipating Process and Governance Restrictions*



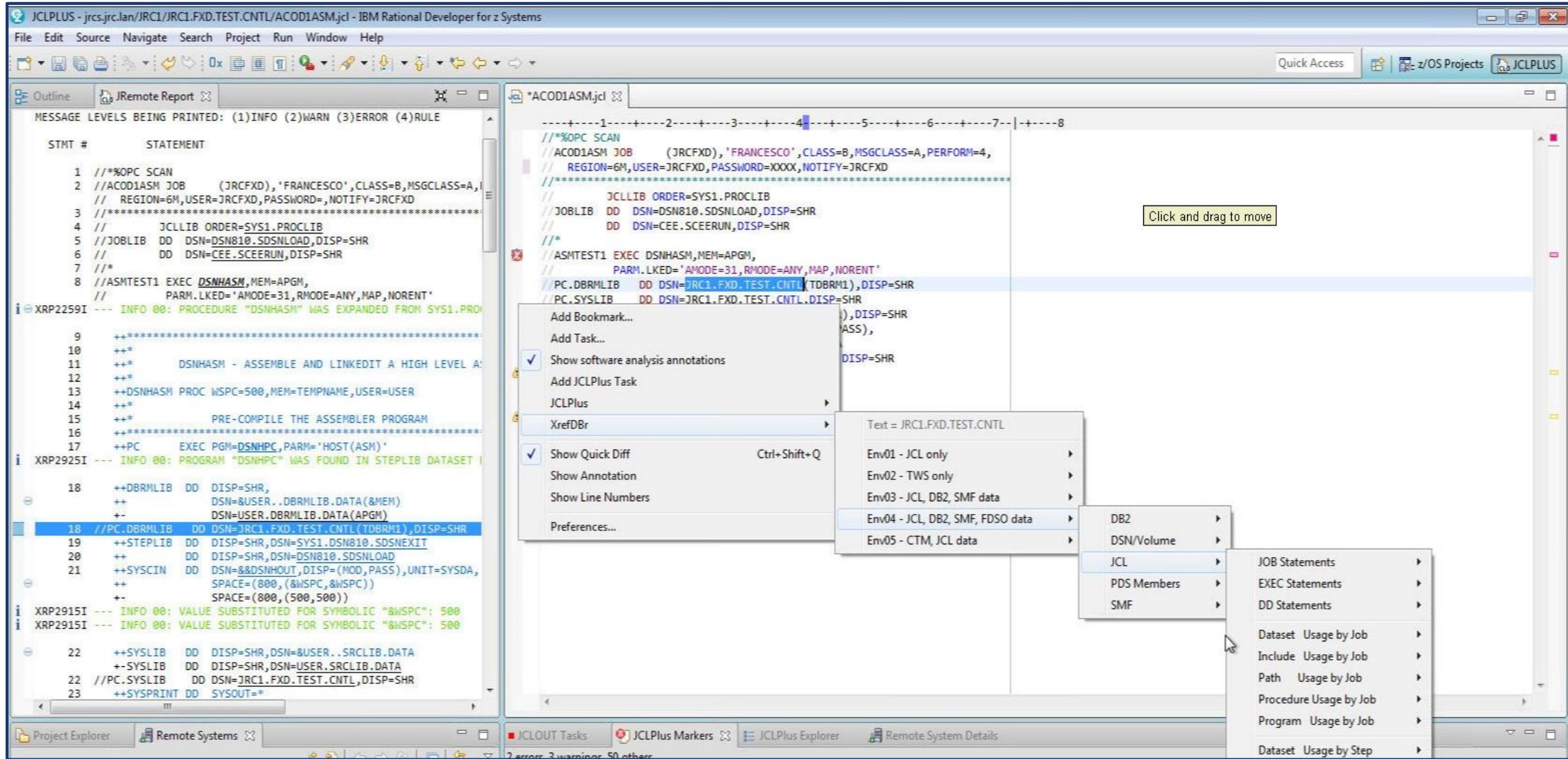
Allow resolution of IWS variables when testing, without the need for developer access to IWS database

# Considerations— Policies and Governance



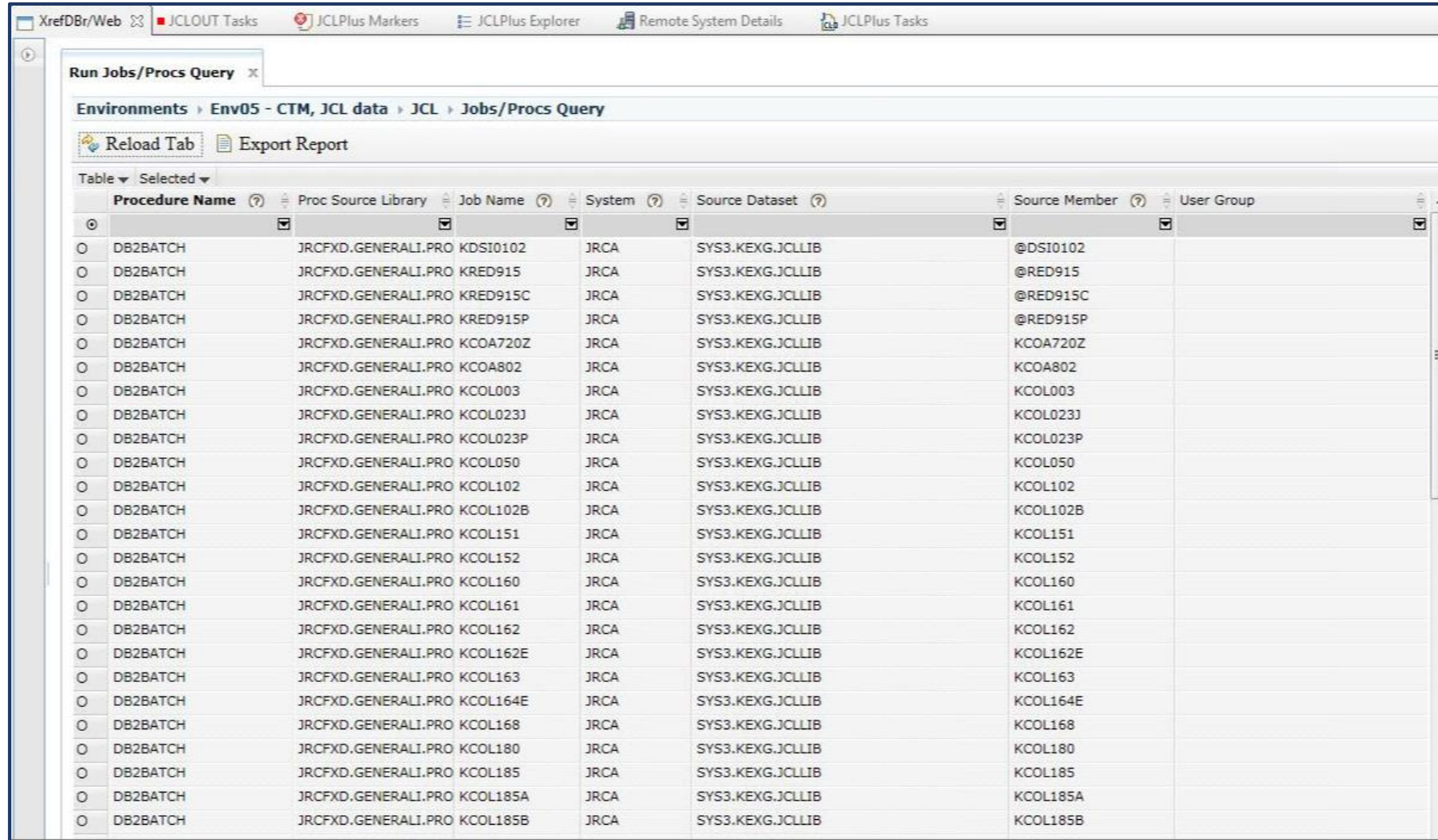
The screenshot displays the IBM Rational Developer for z Systems interface. The main window shows the JCL code for the job \*ACOD1ASM.jcl. The code includes various DD statements for datasets and EXEC statements for programs like ASMHASHM and LKED. A specific line, `++SYSLMOD DD DSN=JRC1.FXD.TEST.LOAD&OYMD,DISP=SHR`, is highlighted in yellow. A blue callout box labeled "IWS Variable" points to this line. Another blue callout box labeled "Click and drag to move" points to the same line. The left pane shows the JRemote Report with several error and warning messages, including "INVALID DATASET NAME FORMAT" and "DATASET NOT FOUND". The bottom status bar shows "JCLPlus Markers" and "Remote System Details".

# Considerations— *Level of Testing*



The screenshot displays the IBM Rational Developer for z Systems interface. The main editor shows a JCL file named \*ACOD1ASM.jcl. A context menu is open over the dataset reference 'JRC1.FXD.TEST.CNTL'. The menu options include 'Add Bookmark...', 'Add Task...', 'Show software analysis annotations', 'Add JCLPlus Task', 'JCLPlus', 'XrefDBr', 'Show Quick Diff', 'Show Annotation', 'Show Line Numbers', and 'Preferences...'. The 'XrefDBr' option is selected, and a sub-menu is visible with the following options: 'Text = JRC1.FXD.TEST.CNTL', 'Env01 - JCL only', 'Env02 - TWS only', 'Env03 - JCL, DB2, SMF data', 'Env04 - JCL, DB2, SMF, FDSO data', and 'Env05 - CTM, JCL data'. The 'Env04' option is selected, and another sub-menu is visible with the following options: 'DB2', 'DSN/Volume', 'JCL', 'PDS Members', and 'SMF'. The 'JCL' option is selected, and a final sub-menu is visible with the following options: 'JOB Statements', 'EXEC Statements', 'DD Statements', 'Dataset Usage by Job', 'Include Usage by Job', 'Path Usage by Job', 'Procedure Usage by Job', 'Program Usage by Job', and 'Dataset Usage by Step'. The status bar at the bottom indicates '2 errors, 3 warnings, 50 others'.

# Considerations— *Level of Testing*



The screenshot shows a web-based interface for querying jobs and procedures. The browser tabs include 'XrefDBr/Web', 'JCLOUT Tasks', 'JCLPlus Markers', 'JCLPlus Explorer', 'Remote System Details', and 'JCLPlus Tasks'. The main window title is 'Run Jobs/Procs Query'. The breadcrumb navigation is 'Environments > Env05 - CTM, JCL data > JCL > Jobs/Procs Query'. There are buttons for 'Reload Tab' and 'Export Report'. The table below lists various jobs, all with 'DB2BATCH' as the procedure name and 'JRCA' as the system.

Procedure Name	Proc Source Library	Job Name	System	Source Dataset	Source Member	User Group
DB2BATCH	JRCFXD.GENERALI.PRO	KDSI0102	JRCA	SYS3.KEXG.JCLLIB	@DSI0102	
DB2BATCH	JRCFXD.GENERALI.PRO	KRED915	JRCA	SYS3.KEXG.JCLLIB	@RED915	
DB2BATCH	JRCFXD.GENERALI.PRO	KRED915C	JRCA	SYS3.KEXG.JCLLIB	@RED915C	
DB2BATCH	JRCFXD.GENERALI.PRO	KRED915P	JRCA	SYS3.KEXG.JCLLIB	@RED915P	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOA720Z	JRCA	SYS3.KEXG.JCLLIB	KCOA720Z	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOA802	JRCA	SYS3.KEXG.JCLLIB	KCOA802	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL003	JRCA	SYS3.KEXG.JCLLIB	KCOL003	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL023J	JRCA	SYS3.KEXG.JCLLIB	KCOL023J	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL023P	JRCA	SYS3.KEXG.JCLLIB	KCOL023P	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL050	JRCA	SYS3.KEXG.JCLLIB	KCOL050	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL102	JRCA	SYS3.KEXG.JCLLIB	KCOL102	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL102B	JRCA	SYS3.KEXG.JCLLIB	KCOL102B	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL151	JRCA	SYS3.KEXG.JCLLIB	KCOL151	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL152	JRCA	SYS3.KEXG.JCLLIB	KCOL152	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL160	JRCA	SYS3.KEXG.JCLLIB	KCOL160	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL161	JRCA	SYS3.KEXG.JCLLIB	KCOL161	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL162	JRCA	SYS3.KEXG.JCLLIB	KCOL162	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL162E	JRCA	SYS3.KEXG.JCLLIB	KCOL162E	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL163	JRCA	SYS3.KEXG.JCLLIB	KCOL163	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL164E	JRCA	SYS3.KEXG.JCLLIB	KCOL164E	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL168	JRCA	SYS3.KEXG.JCLLIB	KCOL168	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL180	JRCA	SYS3.KEXG.JCLLIB	KCOL180	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL185	JRCA	SYS3.KEXG.JCLLIB	KCOL185	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL185A	JRCA	SYS3.KEXG.JCLLIB	KCOL185A	
DB2BATCH	JRCFXD.GENERALI.PRO	KCOL185B	JRCA	SYS3.KEXG.JCLLIB	KCOL185B	

# Considerations – Common Understanding of Applications Among Development and Release Stakeholders

JCLPLUS - JCLOUT report read from /RemoteSystemsTempFiles/FttRemoteTempFiles/jrcs.jrc.lan/JRC1/JRC1.FXD.TEST.JCLOUT - IBM Rational Developer for z Systems

File Edit Navigate Search Project Run Window Help

Quick Access z/OS Projects

XrefDBr/Web JCLOUT Tasks JCLPlus Markers JCLPlus Explorer Remote System Details JCLPlus Tasks

Parameters Operations Query Count Operations Query Run Application Details

Click and drag to move

Environments Env02 - TWS only TWS Database Application Details

Reload Tab Export Report Close Tab Close other Tabs

Table	Selected	Application ID	O	CPU	Q	Start Time	End Time	Count	...
TWS Subsystem			10	CPU	\$Q11MPS5	Q PDB main part 5- set 1	12:00:00 AM	12:00:00 AM	16
			11	CPU	\$Q11MPS6	Q PDB index 1- set 1	12:00:00 AM	12:00:00 AM	15
			12	CPU	\$Q11MPS7	Q PDB index 2- set 1	12:00:00 AM	12:00:00 AM	1
			13	CPU	\$Q11MPA1	Q posit archive image 1	12:00:00 AM	12:00:00 AM	8
			20	NREP	NJCLBR14	End of Images	12:00:00 AM	12:00:00 AM	1
			40	CPU	\$Q5PS100	RTTC PDB PS101 extract	12:00:00 AM	12:00:00 AM	9

3 rows 64 rows

Zoom In Zoom Out Export Detail View

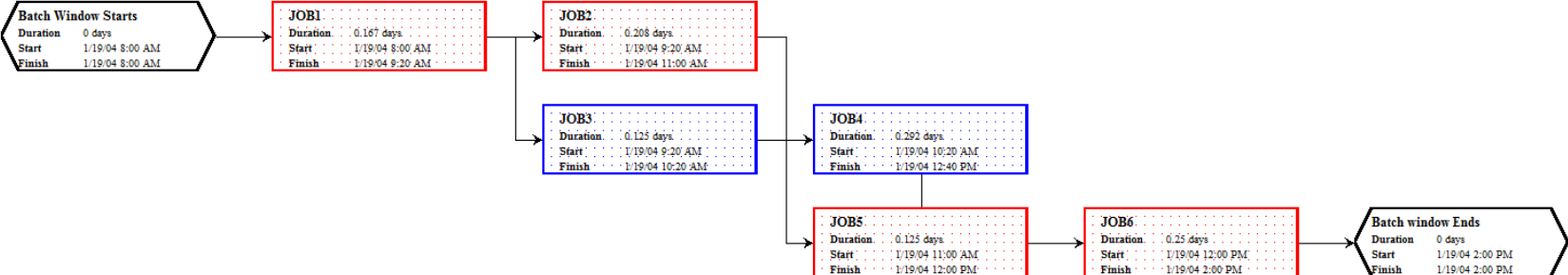
# Considerations – *Common Understanding of Applications Among Development and Release Stakeholders*

- Code is easier to read and manage when formatted consistently and adhering to common naming conventions
- Reporting is more powerful and specific when naming standards are well deployed

```
EDIT      SEAS.JCLPLUS.CNTL(COMPILE) - 01.01      Columns 00001 00072
Command ==> _____ Scroll ==> CSR
***** Top of Data *****
000001 //SEA5CMPL JOB (5056,XXX),'.. D. BERG ..',CLASS=X,
000002 //      MSGCLASS=X,MSGLEVEL=(1,1),NOTIFY=SEAS
000003 /*JOBPARM L=50
000004 /** COBOL COPMPILE STEP
000005 //COMPILE EXEC PGM=IKFCBL00,
000006 //      REGION=4096K,
000007 //      PARM='CLIST,OPT,SXR,NOLOAD,DEC,NOSEQ,NOADV,SIZE=800K'
000008 //STEPLIB DD DSN=CS10EM.SYS1.VSCOLIB,
000009 //      DISP=SHR
000010 //SYSUT1 DD SPACE=(CYL,(5,5)),UNIT=SYSDA
000011 //SYSUT2 DD UNIT=SYSDA,
000012 //      SPACE=(CYL,(5,5))
000013 //SYSUT3 DD SPACE=(CYL,(5,5)),
000014 //      UNIT=SYSDA
000015 //SYSUT4 DD UNIT=SYSDA,
000016 //      SPACE=(CYL,(5,5))
000017 //SYSPRINT DD SYSOUT=*
000018 //SYSUDUMP DD SYSOUT=*
000019 //SYSIN DD DSN=SEA2.COBOL.SOURCE(TECHLIST),
000020 //      DISP=SHR
000021 //SYSPUNCH DD DSN=SEA2.OBJ.CNTL(TECHLIST),
```

```
EDIT      SEAS.JCLPLUS.CNTL(COMPILE) - 01.02      Columns 00001 00072
Command ==> _____ Scroll ==> CSR
***** Top of Data *****
000100 //SEA5CMPL JOB (5056,XXX),'.. D. BERG ..',
000200 //      CLASS=X,
000300 //      MSGCLASS=X,
000400 //      MSGLEVEL=(1,1),
000500 //      NOTIFY=SEAS
000600 /*JOBPARM L=50
000700 /** COBOL COPMPILE STEP
000800 /** COBOL COPMPILE STEP
000900 /** COBOL COPMPILE STEP
001000 //COMPILE EXEC PGM=IKFCBL00,
001100 //      REGION=4096K,
001200 //      PARM='CLIST,OPT,SXR,NOLOAD,DEC,NOSEQ,NOADV,SIZE=800K'
001300 //STEPLIB DD DSN=CS10EM.SYS1.VSCOLIB,
001400 //      DISP=SHR
001500 //SYSUT1 DD SPACE=(CYL,(5,5)),
001600 //      UNIT=SYSDA
001700 //SYSUT2 DD UNIT=SYSDA,
001800 //      SPACE=(CYL,(5,5))
001900 //SYSUT3 DD SPACE=(CYL,(5,5)),
002000 //      UNIT=SYSDA
002100 //SYSUT4 DD UNIT=SYSDA,
```

# Considerations- Designed for Both Build and Run Stakeholders

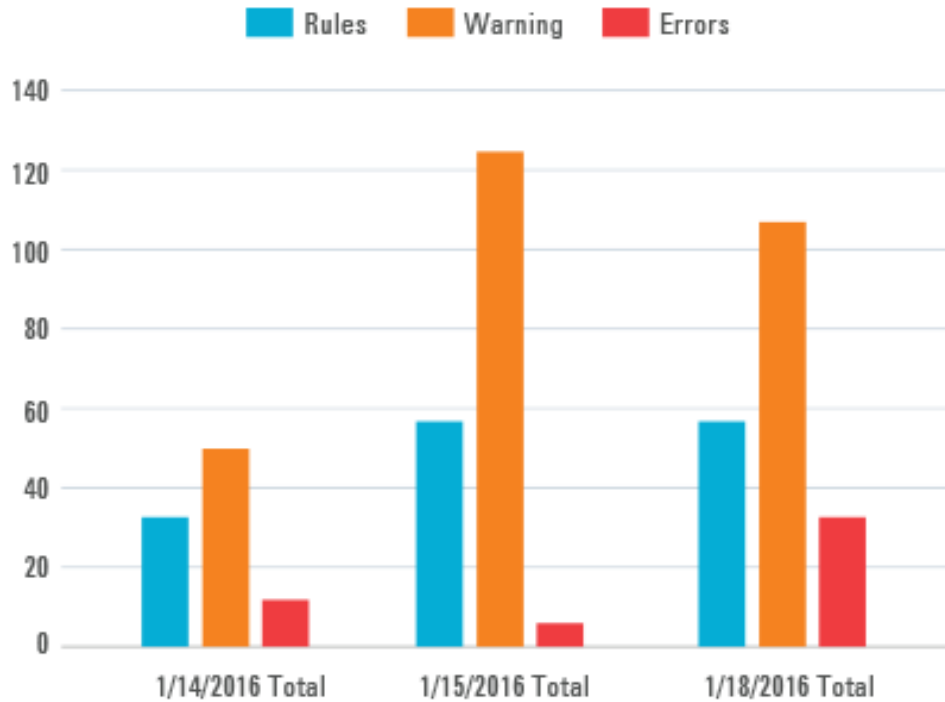


**Defects by Job**

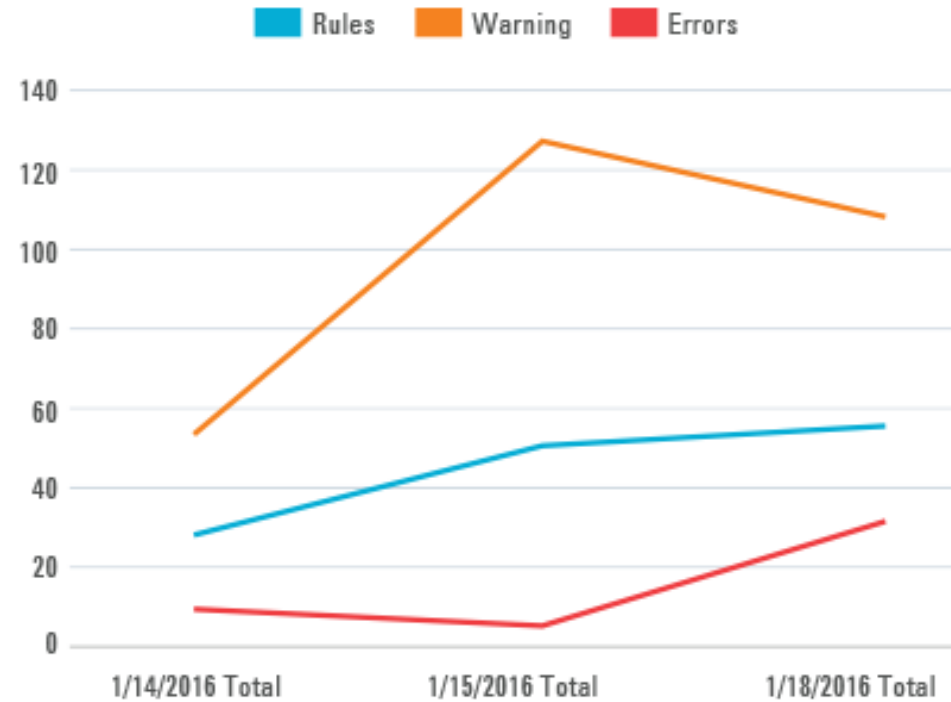
Job ID	Defect Message
@DSI0102	XRP22453 *** WARN 04: UNABLE TO FIND INCLUDE GROUP: HHSTS080
@DSI0102	F9901T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@DSI0102	XRP22453 *** WARN 04: UNABLE TO FIND INCLUDE GROUP: HHSTS080
@DSI0102	XRP22453 *** WARN 04: UNABLE TO FIND INCLUDE GROUP: HHSTS080
@RED915	KRED915 RC=4
@RED915	VSIJCL XRP22193 *** WARN 04: DATASET NOT FOUND: SYS3.VEXG.
@RED915	VSIJCL XRP22253 *** WARN 04: RECFM=U IS INVALID FOR JCLLIB: SYS3.VEXG.JCLLIB
@RED915	SYSREC00 XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915	SYSTSIN XRP24123 *** WARN 04: DYNALOC FAILED, UNABLE TO VERIFY MEMBER IN: SYS3.
@RED915	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915	F9901T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915	F9902T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER
@RED915	F9903T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER
@RED915C	KRED915C RC=4
@RED915C	VSIJCL XRP22193 *** WARN 04: DATASET NOT FOUND: SYS3.VEXG.PROCLIB
@RED915C	VSIJCL XRP22253 *** WARN 04: RECFM=U IS INVALID FOR JCLLIB: SYS3.VEXG.PROCLIB
@RED915C	SYSREC00 XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915C	SYSTSIN XRP24123 *** WARN 04: DYNALOC FAILED, UNABLE TO VERIFY MEMBER IN: SYS3.
@RED915C	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915C	F9901T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915C	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915C	F9902T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER
@RED915C	F9903T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER
@RED915P	KRED915P RC=4
@RED915P	VSIJCL XRP22193 *** WARN 04: DATASET NOT FOUND: SYS3.VEXG.PROCLIB
@RED915P	VSIJCL XRP22253 *** WARN 04: RECFM=U IS INVALID FOR JCLLIB: SYS3.VEXG.PROCLIB
@RED915P	SYSREC00 XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915P	SYSTSIN XRP24123 *** WARN 04: DYNALOC FAILED, UNABLE TO VERIFY MEMBER IN: SYS3.
@RED915P	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915P	F9901T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915P	SORTOUT XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TREBALL
@RED915P	F9902T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER
@RED915P	F9903T XRP22973 *** WARN 04: UNIT NAME NOT DEFINED TO MVS: TRANSFER

# Considerations - Reliance on *Reporting and Metrics*

## Graphical Representation



## Trends Analysis



## Indices

#Stmts/Job	60
#Defects/Job	10
#Stmts/Job w/Defects	6
#Critical-Defects/Job	3
#Standards-Defects/Job	8

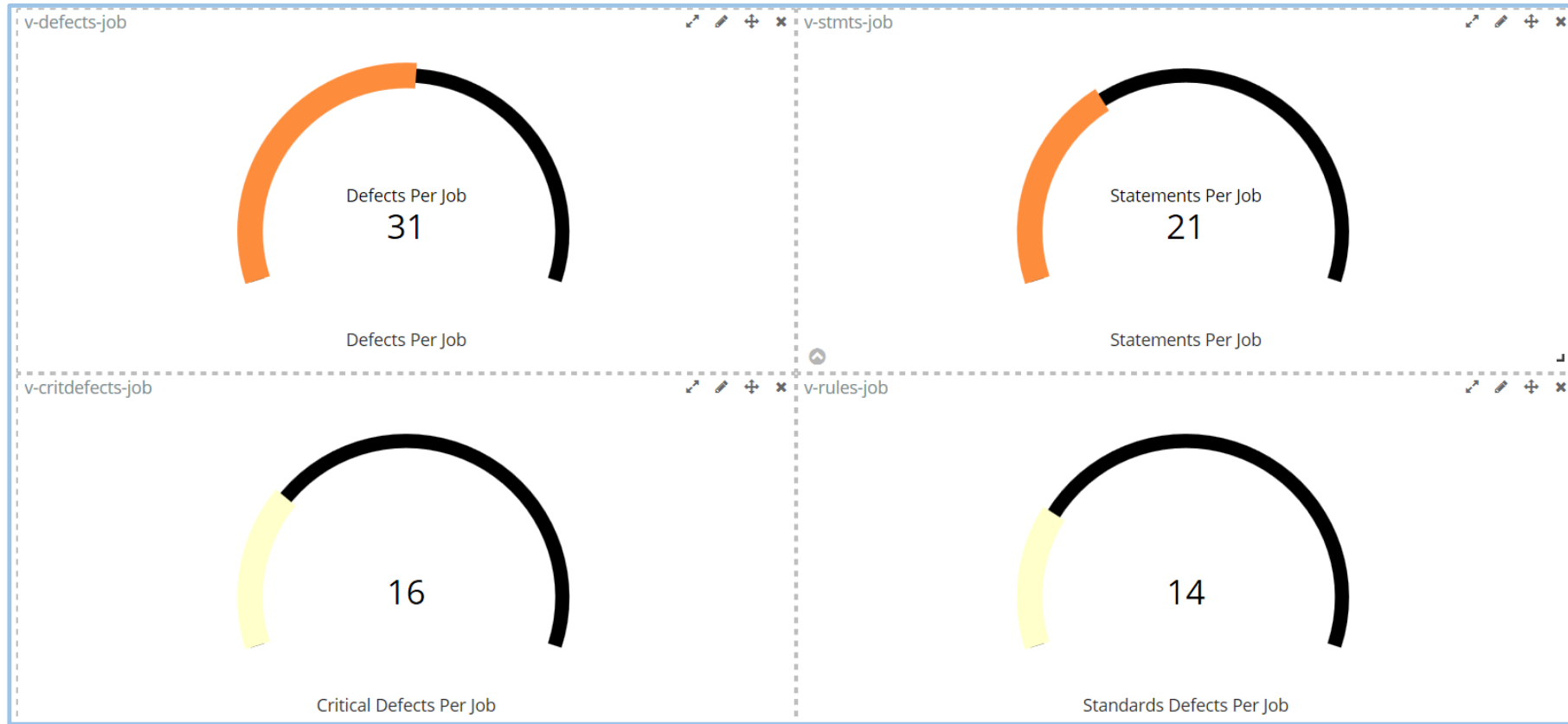


# Considerations - Reliance on *Reporting and Metrics*

## Global Data

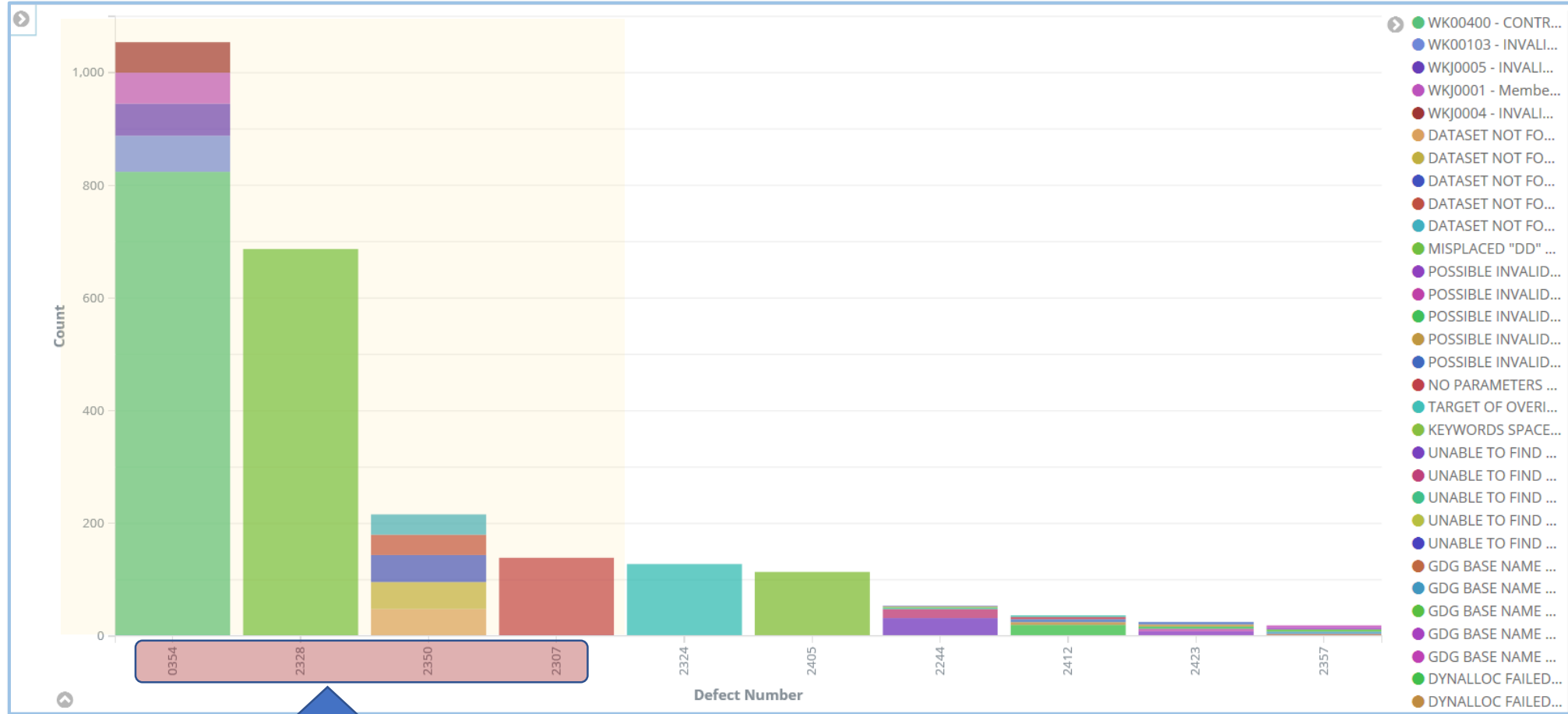
Date ↕	Mode ↕	Testing Process ↕	# Critical Defects ↕	# Standards Defects ↕	# Stmt Defects ↕	# Jobs Tested ↕	Records ↕
October 19th 2018, 14:38:01.769	EDIT	SEAUSER	2	0	3	1	1
October 19th 2018, 14:38:01.776	BATCH	SEAUSERC	277	0	267	1	1
October 19th 2018, 14:38:01.778	BATCH	SEAUSERB	392	0	449	23	1
October 19th 2018, 14:38:01.780	EDIT	SEAUSER	2	0	3	1	1
October 19th 2018, 14:38:01.781	EDIT	SEAUSER	2	0	3	1	1
October 19th 2018, 14:38:01.782	EDIT	SEAUSER	0	17	13	1	1
October 19th 2018, 14:38:01.786	BATCH	SEAUSERB	275	414	389	7	1
October 19th 2018, 14:38:01.790	BATCH	SEAUSERB	275	414	389	7	1
October 19th 2018, 14:38:01.793	EDIT	SEAUSER	2	0	2	0	1
October 19th 2018, 14:38:01.801	EDIT	SEAUSER	2	8	6	1	1
October 19th 2018, 14:38:01.804	EDIT	SEAUSER	15	4	17	1	1
October 19th 2018, 14:38:01.806	BATCH	SEAUSERB	181	343	291	39	1
October 19th 2018, 14:38:01.808	EDIT	SEAUSER	2	12	7	1	1
			<b>1,427</b>	<b>1,212</b>	<b>1,839</b>	<b>84</b>	<b>13</b>

From the global data we can deduce the following Indices



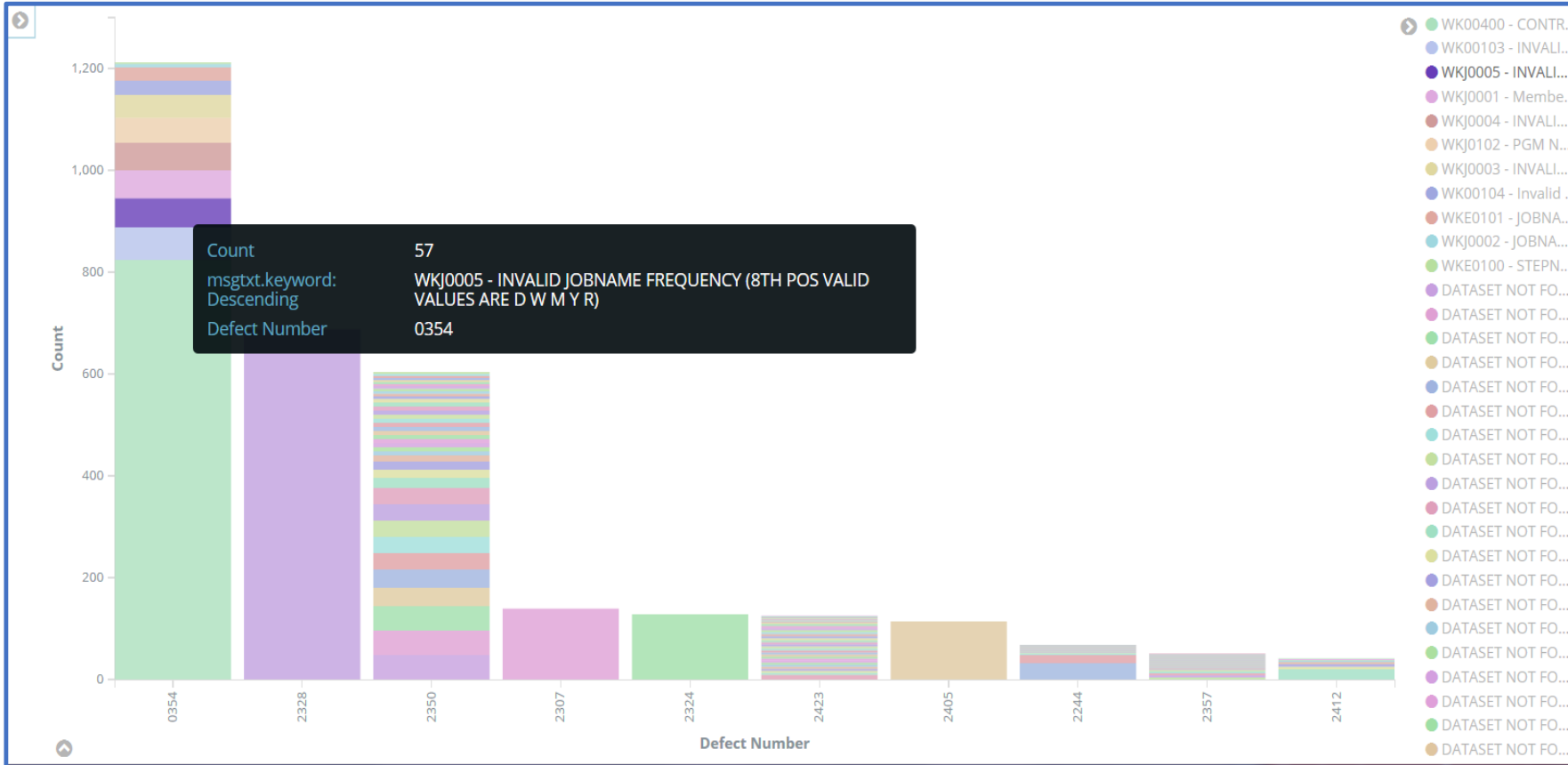
- At a higher level these indices provide significant information for major release, application forecast, massive changes, scheduler setups and other events
- Detailed record offers more information to categorize defects' source, type and frequency

## Defects by Type



Top 4 Defects for This Event

## Defects by Type

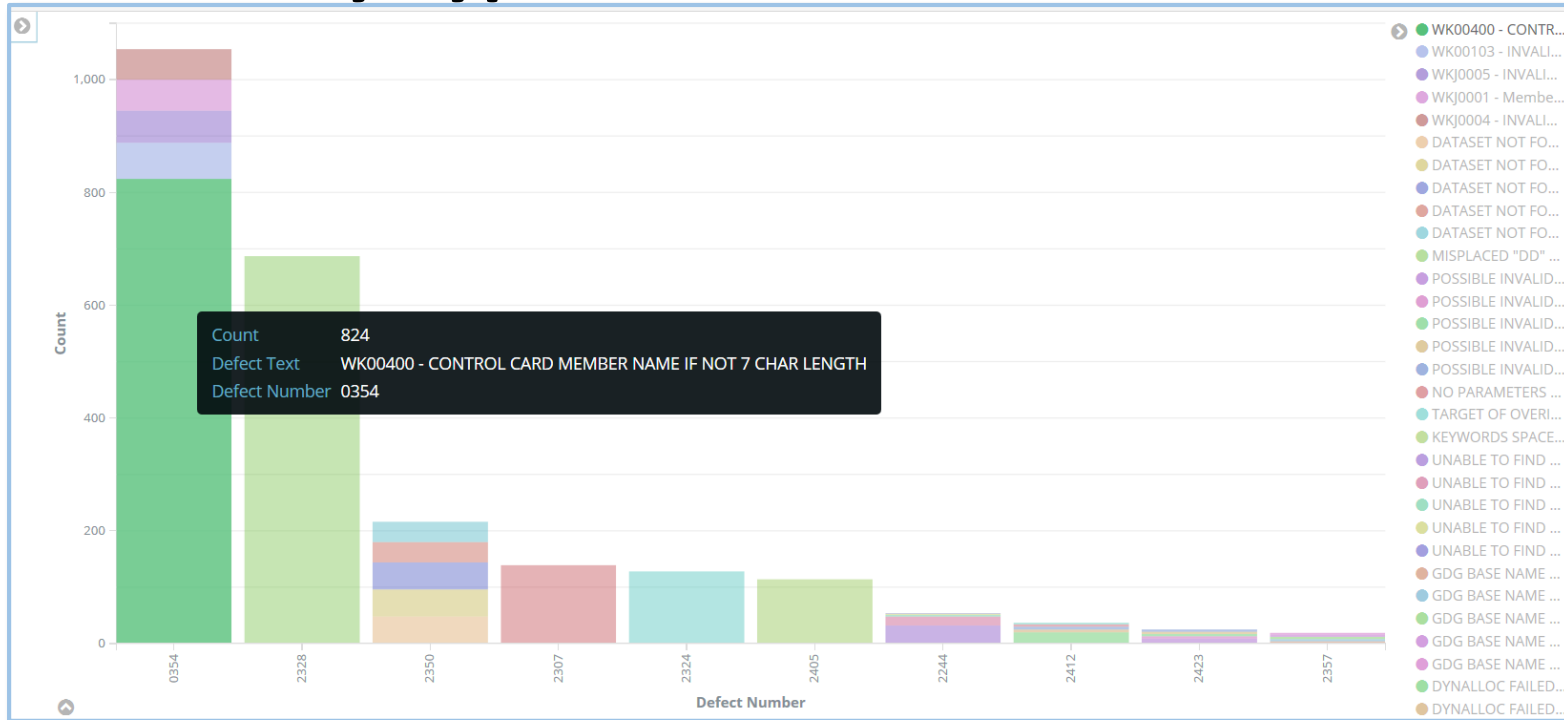


Defect **0354** is related to a Standards Enforcement Defect

This example of a release management shows a lack of company's standards knowledge when deploying an application

An action campaign can be easily implemented for developers (shift-Left)

## Defects by Type



Defect **0354** is related to a standard Enforcement Defect

This example of a release management shows a lack of company's standards knowledge when deploying an application

An action campaign can be easily implemented for developers (shift-Left)

# What Types of Metrics are Interesting?

Why?

# We want your feedback!

- Please submit your feedback online at ....
  - <http://conferences.gse.org.uk/2018/feedback/ni>
- Paper feedback forms are also available from the Chair person
- This session is **NI**

